From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/31/08
Date:	Wednesday, December 31, 2008 11:44:09 AM
Attachments:	

ISS On-Orbit Status 12/31/08

All ISS systems continue to function nominally, except those noted previously or below. *GMT 366: Leap Year's End and…*

New Year's Eve...16 times for the Expedition 18 crew of CDR Mike Fincke, FE-1 Yuri Lonchakov and FE-2 Sandra Magnus while counting down to 2009!

Before morning inspection and breakfast, FE-1 Lonchakov terminated his fifth experiment session for the long-term Russian sleep study MBI-12/SONOKARD, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

CDR Fincke & FE-2 Magnus continued ARED (Advanced Resistive Exercise Device" installation on "overtime", after encountering a snag yesterday with a stuck launch restraint bolt. ACO (Activation & Checkout) Part 1 has been moved to tomorrow since ground engineers need to look over the final ARED installation photos before giving a Go. *[For today's removal of the stuck launch restraint bolt in the left cylinder flywheel, ground teams overnight developed two troubleshooting plans for slipping the flywheel restraint off, one involving trimming the stuck bolt's ends (i.e., shorten it with a hacksaw), the other drilling into the bolts to destroy its protruding tips. Both options will require cleaning up any remaining protrusion with a file.]*

In the SM (Service Module), FE-1 Lonchakov performed troubleshooting on the new EXPOSE-R payload installation which showed no telemetry indication of mated

connectors in the unit's power circuitry. *[Troubleshooting, with ground support tagup, consisted of a thorough visual inspection of the electrical connectors and a test of the BKS onboard cable network by measuring electrical resistances between connector terminals.]*

The FE-2 conducted the T+2d inflight microbiology analyses for the samples collected on 12/29 from the PWD (Potable Water Dispenser) Ambient plus SVO-ZV and SRV-K Warm taps. *[Sandy reported "yellow" for Coliform (= Negative), "no purple dots" on the MCD (Microbial Capture Device) and a (nominal) incubation bag temperature of 80 degC.]*

Lonchakov set up new Bubble dosimeters for recording radiation traces as an additional component of the RS (Russian Segment) radiation payload suite "Matryoshka-R" (RBO-3-2), initializing and deploying the detectors. Proper function of the setup was later verified with the LULIN-5 electronics box. *[A total of eight Bubble dosimeter detectors (A01-A08) were initialized in the Bubble dosimeter reader in the SM and positioned at their exposure locations, three in the spherical "Phantom" unit on the DC1 panel and five in the SM (two in starboard crew cabin on both sides of the MOSFET (metal oxide semiconductor field-effect transistor) dosimeter detector unit, two under the work table, and one at panel 410). The setup was photo-documented with the NIKON D2X camera and also reported to TsUP via log sheet via OCA. The complex Matryoshka payload suite is designed for sophisticated radiation studies. Note: Matryoshka is the name for the traditional Russian set of nested dolls.]*

Yuri also performed more troubleshooting in the FGB to investigate an unexplained "smoke" indication light on the PSS Caution & Warning status panel, today checking connectors behind panel (PPS) 339 and associated instruments. *[A check behind panel 306 on 12/17 failed to clear the issue.]*

After setting up the SHERE (Shear History Extensional Rheology Experiment) payload equipment over the weekend, Mike Fincke had two experiment runs on his schedule for today, with the second run depending on the continuing work on ARED. Planned SHERE activities for today were –

- Activating the MSG (Microgravity Science Glovebox) from the A31p laptop,
- Powering on the SHERE hardware,
- Accessing the CGBA (Commercial Generic Bioprocessing Apparatus) to install the SHERE FM (Fluid Module) #32;
- Supporting the first SHERE experiment run (Test Point 29);
- Transferring the module with the fluid sample,
- Installing FM #36 for the second experiment run (Test Point 30);
- Removing the FM from the CGBA, followed by SHERE data transfer;
- Turning off the SHERE/CGBA equipment;

- Transferring the data files to the MSG laptop for subsequent downlink, and
- Powering down the MSG.

[Mike has 25 new Fluid Modules available that were delivered on STS-126, of a new-and-improved design that should be easier to deploy & close than the ones Greg Chamitoff used. Background: Rheology is the study of the deformation and flow of matter under the influence of an applied stress ("preshearing" = rotation) which might be, for example, a shear stress or extensional stress. In practice, rheology is principally concerned with extending the "classical" disciplines of elasticity and (Newtonian) fluid mechanics to materials whose mechanical behavior cannot be described with the classical theories. SHERE is designed to study the effect of preshear (rotation) on the transient evolution of the microstructure and viscoelastic tensile stresses for solutions with long chains of monodisperse dilute polymer molecules in the MSG. Collectively referred to as "Boger fluids," these polymer solutions have become a popular choice for rheological studies of non-Newtonian fluids and are the non-Newtonian fluid used in this experiment. The SHERE hardware consists of the Rheometer, Camera Arm, Interface Box, Cabling, Keyboard, Tool Box, Fluid Modules, and Stowage Tray.]

The FE-1 performed another collection of the periodic readings of potentially harmful atmospheric contaminants in the SM, using the CMS (Countermeasure System), a component of the SKDS GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, today using preprogrammed microchips to measure for o-Xylol (1,2-Dimethylbenzol, C_8H_{10}) and Methyl-Mercaptan (Methanethiol, CH_4S).

Sandy Magnus used the vacuum cleaner/brush plus other tools to perform the periodic 3:15h USOS hatch seal inspection (Node-1 Forward, Aft & Starboard, Lab Aft & Forward, Node-2 Aft, Starboard & Port, Airlock, Columbus, Kibo JPM Zenith & Starboard, Kibo JLP Nadir) in support of ACS (Atmospheric Control System) maintenance.

With TsUP/Moscow approval, Magnus set up an IWIS RSU (Internal Wireless Instrumentation System/Remote Sensor Unit) in the SM (from power outlet A331), completing IWIS network setup for data taking during the initial ARED exercise.

Sandy also conducted the weekly 10-min. CWC (Contingency Water Container) inventory as part of on-going WRM (Water Recovery & Management) assessment of onboard water supplies. Updated "cue cards" based on the crew's water calldowns are sent up every other week. *[The new card (18-0006H) lists 39 CWCs (~1,250.9 L total) for the four types of water identified on board: technical water (673.8 L, for Elektron electrolysis), potable water (530.4 L, incl. 174.6 L currently off-limit because of Wautersia bacteria), condensate water (0.0 L), waste/EMU dump and other (46.7 L). Wautersia bacteria are typical water-borne microorganisms that*

have been seen previously in ISS water sources. These isolates pose no threat to human health.]

As part of Progress M-01M/31P unloading, Yuri transferred the new BIO-2/BIORISK-MSV container #12 from the cargo ship and set it up for exposure in the SM in the conical section of the PkhO Transfer Compartment. *[BIORISK entails a series of experiments designed to expose samples of materials to study adaptation and changes of bacteria & fungi within the typical micro biota residing on structural materials of space-flown equipment. Early data from these experiments already point to significant effects of space flight on growth, reproduction, and biological properties of test microbes and fungi. BIORISK-KM experiments deal with "passive" materials, BIORISK-MSV with microorganisms-materials within the SM and BIORISK-MSN with microorganisms-materials outside the ISS.]*

Lonchakov started another round of the monthly preventive maintenance of RS (Russian segment) ventilation systems, today working 1:50h in the SM, cleaning airducts, ventilator fans and grilles.

Working from his discretionary "time permitting" task list, Yuri also was to conduct the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the passageways PrK (SM Transfer Compartment)–PrK–RO (SM Working Compartment), PkhO (SM Transfer Compartment)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1.

Also on Lonchakov's voluntary list was the frequent status check on the Russian BIO-5 Rasteniya-1 ("Plants-1") experiment, verifying proper operation of the BU Control Unit and MIS-LADA Module fans (testing their air flow by hand). *[Rasteniya-1 researches growth and development of plants under spaceflight conditions in the LADA-14 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP).]*

Sandy performed the daily IMS maintenance, consisting of updating/editing of its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

At ~2:55am EST, the crew held a 20-min. TV conference with Russian top management of RSC Energia, IBMP, GCTC (Gagarin Cosmonaut Training Center) and TsUP, postponed from yesterday.

At ~3:15am EST, the crew joined for a PAO TV Symbolic Activity downlink for the European Space Agency (ESA) for the New Year, presenting two unstowed placards expressing a Declaration of Human Rights in the COL (Columbus Orbital

Laboratory) where they also took a series of photos showing crewmembers with the placards in various scenes.

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (FE-1).

VolSci Program Preview: For the weekend of 1/10 & 1/11, Mike and Sandy were offered three choices for the Voluntary Weekend Science program: (1) SHERE (Shear History Extensional Rheology Experiment) runs for Mike; (2) EPO (Education Payload Operations) Renovation Demo, for Mike & Sandy, to create an educational video demonstration discussing the recent renovations that have occurred on the ISS, for producing an educational product to enhance existing education resources for students in grades K-12; and (3) LOCAD-PTS (Lab-On-A-Chip Application Development – Portable Test System (PTS) for Mike, to perform a Phase 2 Surface Sampling Session in COL using the Glucan LAL Cartridges that will target fungus on ISS surfaces.

CEO (Crew Earth Observations) photo target uplinked for today was **Betsiboka River Delta, Madagascar** *(looking left of track for the major Betsiboka estuary, one of two on the northwest Madagascan coast. Since 1945 deforestation inland increased rapidly. Consequent soil erosion and delivery of sediment to the Betsiboka River and estuary resulted. The estuary is now more than 80% filled by delta islands. Growth of islands has been documented since the first Shuttle flights, and imagery of the present status is requested).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 8:25am EST [= epoch]):
Mean altitude -- 353.4 km
Apogee height -- 358.4 km
Perigee height -- 348.4 km
Period -- 91.61 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007443
Solar Beta Angle -- -3.7 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 61 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57958

Significant Events Ahead (all dates Eastern Time, some changes possible!):
01/14/09 -- ISS reboost w/SM thrusters
02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/12/09 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
08/06/09 -- STS-128/Discovery/17A – MPLM (P), LMC, last crew rotation
08/XX/09 -- Soyuz 5R/MRM2 (Russian Mini Research Module, MIM2) on Soyuz
09/XX/09 -- H-IIB (JAXA HTV-1)
11/12/09 -- STS-129/Atlantis/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P), LMC
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4
12/XX/11-- Proton 3R/MLM w/ERA.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/30/08
Date:	Tuesday, December 30, 2008 12:12:22 PM
Attachments:	image001.gif image002.gif

ISS On-Orbit Status 12/30/08

All ISS systems continue to function nominally, except those noted previously or below.

Before breakfast and exercise, all crewmembers completed a 10-min session with the periodic Russian MedOps test "Hematokrit" (MO-10), which measures the red cell count of the blood, with CDR Fincke acting as CMO (Crew Medical Officer, Russian: “Examiner”). It was the first session for Fincke, Lonchakov & Magnus. *[The blood samples were drawn from a finger with a perforator lancet, then centrifuged in two microcapillary tubes in the M-1100 kit's minicentrifuge, and its hematocrit value was read off the tubes with a magnifying glass. It is a well-known phenomenon of space flight that red blood cell count (normal range: 30-45%) tends to go down over time. After the exam, the data were saved in the IFEP software (In-Flight Examination Program) on the MEC (Medical Equipment Computer), and Lonchakov stowed the equipment.]*

Mike Fincke & Sandy Magnus worked Part 2 of the two-day installation of the new ARED (Advanced Resistive Exercise Device) on the “ceiling” of Node-1. *[Individual installation steps included removing launch restraints with the “Makita” drill tool, installing both exercise rope and cable arm ropes, installing the cylinder flywheels, then the main arm, upper stop cables, liftbar, ARED display and all ARED cables. After installation completion and analysis of all documentary photographs by ground specialists, the crew will be given the Go for ACO (Activation & Checkout) which requires two more days.]*

FE-1 Lonchakov meanwhile had 90 min. reserved for configuring the GFI-11/ OBSTANOVKA (Environment) equipment in the DC1 Docking Compartment and performing the first electric field measurements with the Langmuir Probe on the external hull of the SM (Service Module). *[Field voltages (mV) were scanned cell by cell with the Fluke 105B ScopeMeter oscilloscope, and the oscillograms on the screen recorded by photographing, plus the scanning values were logged in a*

table. The performance of the ScopeMeter was checked with the Elektronika MMTs-01 MultiMeter. All photographic records were then downlinked via OCA.]

Afterwards, the FE-1 had a brief teleconference with TsUP to discuss some questions in regards to a RBO-3-3/MATRYOSHKA-M radiation kit returned to Earth on ULF2.

Magnus used the MAS (Microbial Air Sampler) kit to obtain the periodic microbiology air samples from specific sampling locations including from Kibo JPM (JEM Pressurized Module) mid-module, and the SSK (Surface Sample Kit) to collect/incubate microbiology samples from two prime surface sites for return to ground.

With the Orlan EVA-21 completed last week (12/22) and the DC1 no longer required as an airlock, the Progress M-01M/31P cargo ship currently docked to the DC1 its nadir port can be accessed again. To this end, Yuri Lonchakov –

- Performed the usual one-hour leak check on both DC1-SU & SU-31P hatches,
- Opened the hatches (with RS thrusters inhibited during the opening activities),
- Installed the quick-release screw clamps which rigidize the docking joint,
- Installed the air heater/fan unit & air duct in the passageway, and
- Deactivated the Progress (i.e., SUBA/Onboard Equipment Control System & SOTR/Thermal Control System).

At 10:35am, Sandy conducted the periodic VHF-1 emergency communications check over NASA's VHF (Very High Frequency) stations, today at the Dryden (10:42am–10:47am) and White Sands (10:43am–10:50am) stations, talking with Houston/Capcom, MSFC/PAYCOM (Payload Operation & Integration Center Communicator), Moscow/GLAVNI (TsUP Capcom), EUROCOM/Munich and JCOM/Tsukuba in the normal fashion via VHF radio from a handheld microphone and any of the USOS ATUs (Audio Terminal Units). *[Purpose of the test is to verify signal reception and link integrity, improve crew proficiency, and ensure minimum required link margin during emergency (no TDRS) and special events (such as a Soyuz relocation).]*

Yuri completed the periodic (about twice a month) replenishing of the Elektron oxygen generator's water supply for electrolysis, filling the KOV EDV container with water collected in CWC (Contingency Water Container) #1050 from the Lab CCAA (Common Cabin Air Assembly) dehumidifier. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron shutdown.]*

In the SM, the FE-1 performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

The FE-2 conducted the periodic status check on the running payloads CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) and ENose (Electronic Nose), both located in the ER-2 (EXPRESS Rack 2).

The crew had their periodic PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Sandy at ~9:15am, Yuri at ~11:50am, Mike at ~2:10pm EST.

At ~4:20pm, just before sleep time, Yuri will set up the Russian MBI-12 SONOKARD (Sonocard) payload and start his fifth experiment session, using a sports shirt from the SONOKARD kit with a special device in the pocket for testing a new method for acquiring physiological data without using direct contact on the skin. Measurements are recorded on a data card for return to Earth. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR/2.5), TVIS treadmill (FE-1, FE-2/2.5), and VELO bike with bungee cord load trainer (FE-1).

At ~3:40am EST, the crew held a 20-min. TV conference with Russian top management of RSC Energia, IBMP, GCTC (Gagarin Cosmonaut Training Center) and TsUP.

Conjunction Update: Hourly tracking updates of the recurring Cosmos 2421 debris, with predictions quickly stabilizing (i.e., becoming more credible), showed its conjunction with ISS moving from inside the oblong Red zone to the Yellow and then to the Green tolerance box, with Pc (Probability of Collision) going to zero. The DAM (Debris Avoidance Maneuver) was called off before getting to the Flight Rule imposed cutoff of "no later than 2 orbits" prior to the selected time of ignition (TIG, 3:22am EST, with 0.5 m/s delta-V).

Ded Moros Update: Yesterday's New Year's event at TsUP/Moscow with Ded Moros (Grandfather Frost) also featured the winner of the insignia contest for the Soyuz TMA-14 crew in April, a 12-year old girl from Moscow, The picture below shows the press conference with Roskosmos Head Perminov presenting the winning patch design (on left: NASA Representative Joel Montalbano). In the second picture, the winner is talking to the ISS crew.

CEO (Crew Earth Observations) photo target uplinked for today was **Toshka Lakes, Egypt** *(looking left for general oblique views and detailed overlapping frames of lake shorelines. The lakes appear between the line of track and the prominent line of the Nile River)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

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12/XX/11-- Proton 3R/MLM w/ERA.

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A.N. Perminov presenting winning TMA-14 insignia (12/29/08)

Winner of the TMA-14 insignia contest speaking to the ISS crew

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/29/08
Date:	Monday, December 29, 2008 2:53:05 PM
Attachments:	

ISS On-Orbit Status 12/29/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 10 of Increment 18.*

FE-1 Lonchakov worked several hours on the SM (Service Module)'s fire warning system, removing and replacing all ten SIGNAL-VM DS-7A smoke detectors (which were expired). The SIGNAL-VM system was deactivated from the ground beforehand and later turned on again, as was the VD-SU telemetry control mode. *[The ten DS-7A units were replaced last by Yuri Malenchenko on 11/27/07 on Expedition 16.]*

As a relatively new regular activity after deactivation/reactivation of the BITS1-12 and VD-SU control mode, the FE-1 then checked the BRI Smart Switch Router computer and its new Ethernet connection to assess any impact of these activities on Ethernet comm, followed by dumping BRI log files from the RSS1 laptop for downlinking to the ground. *[BRI is part of the RS OpsLAN (Russian Segment/ Operations Local Area Network), with connections to the three SSC clients, the Ethernet tie-in with the US network, and a network printer in the RS.]*

After FE-2 Magnus set up the video equipment in Node-1 for live monitoring of activities by the ground, Sandy & Mike Fincke conducted Part 1 of the 2-day job of replacing the RED (Resistive Exercise Device) with the new Advanced RED (ARED). *[First task for Mike was to remove the RED from the "ceiling" of Node-1 and stow it in the Kibo JPL (JEM Pressurized Logistics Segment), where he had made room for it on 12/26. Next steps were: Retrieving ARED components, installing the VIS (Vibration Isolation Stabilization) parts and the launch stack, checking yoke beam alignment, removing VIS launch restraints, position ARED launch stack (with Sandy's help), and checking the VIS for unobstructed operation. Part 2 will finish the installation tomorrow, followed by extensive ACO (Activation & Checkout) ops.]*

For station structural dynamics measurements of the first ARED use, Magnus

retrieved the IWIS (Internal Wireless Instrumentation System) accelerometer and interface plate from the WRS-2 (Water Recovery System 2) rack and set up the IWIS network of RSUs (Remote Sensor Units) and NCU (Network Control Unit) in the SM, FGB, Lab, Node-1 and Node-2.

With the OBSTANOVKA (Environment) equipment moved from stowage to the DC1 Docking Compartment yesterday as a discretionary task, Yuri Lonchakov today prepared the Fluke 105B scopemeter by connecting accessories and installing alkaline batteries, then worked with the instrument in oscilloscope mode for checkout and familiarization for the upcoming Langmuir Probe experiment ops, supported by ground specialist tagup. *[The GFI-11/OBSTANOVKA payload, along with the IMPULSE experiment, will use ionosphere probes and a pulsed plasma source to make scientific measurements of ionosphere parameters and plasma-wave characteristics.]*

Sandy Magnus performed the regular periodic US WRS (Water Recovery System) sampling. The planned sample run with the TOCA (Total Organic Carbon Analyzer) could not be completed due to another TOCA abort. Data and log files were downlinked for engineering analysis. *[Magnus collected samples from the PWD (Potable Water Dispenser) Hot needle outlet for subsequent inflight processing using the WMK (Water Microbiology Kit) with MCD (Microbial Capture Device) and CDB (Coliform Detection Bag). The usual water reclamation from the sample bags via an absorbing towel (to be dried by airing) and data recording after the analyses concluded the activities.]*

The FE-2 also performed the standard sensor calibration on the CSA-O_2 (Compound Specific Analyzer-Oxygen) units #1043 & #1059, delivered on 1J, using a new calibration adapter (#1001), brought up by 30P. *[Sandy reported an initial gas pressure of 1400 psi and final gas pressure of slightly less than 1400 psi. Flow rate: >10 fps. For #1059, peak reading was 25.8% O_2 and the final (post-calibration) cabin value was 22.1%; for #1043, peak: 25.2%, final cabin value: 22%.]*

On the Russian Matryoshka-R (RBO-3-2) radiation payload in the DC-1, the FE-1 deactivated the AST Spectrometer, removed its ALC-957 PCMCIA (Portable Computer Memory Card International Adapter) and checked out its contents on the RSK-1 laptop before stowing it in its kit (#7). AST remains off.

Lonchakov also unstowed and installed the equipment for the periodic Russian PZE-MO-10 "Hematokrit" testing which is scheduled for his post-sleep use tomorrow. *[MO-10 measures the hematocrit (red blood cell mass) value of the blood (it is a well-known phenomenon of space flight that red blood cell mass {normal range: 30-45%} tends to go down over time).]*

At ~3:15am EST, the crew supported a 20-min PAO TV downlink for a major press conference with Russian officials at TsUP/Moscow in observance of New Year. The participants at TsUP, headed by Anatoly Perminov (Head of the Russian Space Agency Roskosmos), included rocket & space industry leaders, cosmonauts (Solovyev, Padalka, Gidzenko), local & state government representatives, politicians, NASA delegates, and – most of all – Ded Moroz ("Grandfather Frost" of all Russia). Reportedly, the press conference "was fun!"

At ~6:35am, Yuri Lonchakov had a 15-min TV conference with Hegumen Iov of the Eastern Church. *[The Hegumen is the Abbott or Superior of a Monastery.]*

At ~10:25am, the crew downlinked a special New Year's message (being aired on NASA TV) expressing their year-end thoughts on the significance of the international outpost and their New Year's wish for the complex in 2009. The crew also extended "Peace" wishes to all countries partnering in the ISS, in their languages: English (Peace), Russian (Mir), Japanese (Heiwa), French (Paix), Dutch (Vrede), German (Friede), Danish/Norwegian/Swedish (Fred), Italian (Pace), Spanish (Paz).

In the SM, the FE-1 completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

The daily IMS maintenance was performed by Yuri from his discretionary "time permitting" task list, i.e., updating/editing of its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Also on Lonchakov's discretionary list was the frequent status check on the Russian BIO-5 Rasteniya-1 ("Plants-1") experiment, verifying proper operation of the BU Control Unit and MIS-LADA Module fans (testing their air flow by hand). *[Rasteniya-1 researches growth and development of plants under spaceflight conditions in the LADA-14 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP)],*

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Conjunction Advisory: A new conjunction with the recurring Cosmos 2421 debris is being tracked, for a TCA (Time of Closest Approach) tomorrow morning (12/30) at 5:39am EST. Latest data show a total miss distance of 11.7 km (0.13 x 6.1 x -10.0 km) which puts the conjunction into the Red zone, an imaginary oblong box around the ISS (probability of collision Pc = 0.00076). MCC-Houston is working with Russian Ballistic experts on avoidance maneuver options. Two prime options are tomorrow at 3:22am, one of 0.5 m/s, the other of 1.0 m/s delta-V. Analysts are looking at which one is preferable for downstream Progress 32P launch phasing.

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 8:40am EST [= epoch]):
Mean altitude -- 353.5 km
Apogee height -- 358.6 km
Perigee height -- 348.5 km
Period -- 91.61 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.000757
Solar Beta Angle -- -12.8 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 57 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57927

Significant Events Ahead (all dates Eastern Time, some changes possible!):
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Six-person crew on ISS

08/06/09 -- STS-128/Discovery/17A – MPLM (P), LMC, last crew rotation
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12/XX/11-- Proton 3R/MLM w/ERA.

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/28/08
Date:	Sunday, December 28, 2008 11:36:14 AM
Attachments:	

ISS On-Orbit Status 12/28/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – off-duty day for CDR Fincke, FE-1 Lonchakov & FE-2 Magnus. Ahead: Week 10 of Increment 18.*

Mike Fincke & Sandra Magnus started their day with another download of last night's data of the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment from their Actiwatches to the HRF-1 (Human Research Facility 1) laptop as part of the week-long session with SLEEP. *[To monitor the crewmember's sleep/wake patterns and light exposure, Mike & Sandy wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition and use the payload software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list. It was the second session for Mike, the first for Sandra.]*

Mike serviced the US WRS (Water Recovery System) by refilling the WSTA (Water Storage Tank Assembly) with pretreated urine from EDV-U container (#810, then #882) for processing by the UPA (Urine Processing Assembly). *[The WSTA should be filled to no more than 75%. Recycled water from the PWD may now be used by the crew for non-oral hygiene purposes.]*

Yuri Lonchakov performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. Additionally, the FE-1 today checked up on the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem, gathering weekly data on total operating time & "On" durations for reporting to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO*

& KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]

The FE-1 had a number of discretionary tasks on his “time permitting” job list for today –

- Conducting the frequent status check on the Russian BIO-5 Rasteniya-1 ("Plants-1") experiment, verifying proper operation of the BU Control Unit and MIS-LADA Module fans (testing their air flow by hand). *[Rasteniya-1 researches growth and development of plants under spaceflight conditions in the LADA-14 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP)],*
- Running a session of the DZZ-2 "Diatomeya" ocean observations program, using an HDV camcorder for nocturnal observations of the ocean to detect and record bio-luminescent glows in high production water areas. According to available data, the glow may be visible as light greenish spots of low intensity. *[Target zones in the Pacific Ocean were New Zealand’s North-Eastern offshore areas & the California peninsula, the Gulf of Carpentaria (Australia) and Queen Charlotte Bay), in the Indian & Pacific Oceans geological location north of Kerguelen Island and south of Aleutian Islands, in the Indian & Pacific Oceans the west of Australia to the east of New Zealand, and from south of the Madagascar Island to the north of New Zealand],*
- Another ECON KPT-3 session, making observations and taking aerial photography for Russia's Environmental Safety Agency (ECON) using the D2X with SIGMA 300-800mm telephoto lens, and
- Searching for and collecting hardware required for the externally installed OBSTANOVKA (Environment) experiment, including the Fluke 105B scopemeter with accessories, eight alkaline batteries for the scopemeter and the Elektronika-MMTs-1 Multimeter instrument. Four batteries were to be installed and both Fluke and MMTs-01 checked out. After a Langmuir Probe hardware familiarization review tomorrow (12/29), the first measurements of the plasma environment near the docked Soyuz spacecraft will be taken on 12/30 as part of the OBSTANOVKA experiment Part 1. *[The GFI-11/ OBSTANOVKA payload, along with the IMPULSE experiment, will use ionosphere probes and a pulsed plasma source to make scientific measurements of ionosphere parameters and plasma-wave characteristics.]*

Mike & Sandy’s “job jar” task list for today had three voluntary work suggestions –

- Removing IWIS (Internal Wireless Instrumentation System) hardware (accelerometer & interface plate) from the WRS-2 rack to allow access for door opening, and later reinstalling the equipment in front of the rack,
- Loading the TOCA (Total Organic Carbon Analyzer) software update from

the TOCA USB drive on the SSC-7 (Station Support Computer 7) laptop. *[The update was written in response to the aborted TOCA run on 12/24.]*, and

- For Mike to fill out the regular FFQ (Food Frequency Questionnaire) for the fourth time on the MEC (Medical Equipment Computer).

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Fincke & Lonchakov talked with their families on scheduled PFCs (Private Family Conferences) via S-band/audio & Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Yuri at ~6:10am, Mike at ~3:45pm EST.

VolSci Update: For yesterday's Voluntary Weekend Science program, Mike received kudos from the Payload team: "Excellent job on SHERE's Dry Run yesterday! You are definitely ready for Wednesday's science runs, and we are eagerly looking forward to running them with you. Thank you very much for offering to do an additional science run, but we were just not ready to support it thermally in either the MSG or CGBA… We also appreciate the extra camera views you have been giving us in Columbus. It greatly helps the team's situational awareness, and it's almost like being there. Wish we were there!"

No CEO (Crew Earth Observations) photo targets uplinked for today.

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/27/08
Date:	Saturday, December 27, 2008 2:49:04 PM
Attachments:	

ISS On-Orbit Status 12/27/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – rest day for CDR Fincke, FE-1 Lonchakov & FE-2 Magnus.*

CDR Fincke & FE-2 Magnus started their day with another download of last night's data of the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment from their Actiwatches to the HRF-1 (Human Research Facility 1) laptop as part of the week-long session with SLEEP. *[To monitor the crewmember's sleep/wake patterns and light exposure, Mike & Sandy wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition and use the payload software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list. It was the second session for Mike, the first for Sandra.]*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the SM (Service Module) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

As part of the house cleaning, Yuri Lonchakov conducted regular maintenance inspection & cleaning of fan screens in the FGB (TsV2), DC-1 (V3, VD1) and SM (VPkhO, VPO7, VGZhT2, VPrK, FS5, FS6, FS9 & FS14).

Later, when performing the routine daily servicing of the SOZh system (ECLSS/ Environment Control & Life Support System) in the SM, Yuri also temporarily powered down the Russian POTOK-150MK (150 micron) air filter unit of the SM's

SOGS air revitalization subsystem for the periodic cleaning of its pre-filter, using the vacuum cleaner with narrow-slit nozzle attachment. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

CDR Fincke serviced the US WRS (Water Recovery System) by refilling the WSTA (Water Storage Tank Assembly) with pretreated urine from EDV-U container for processing by the UPA (Urine Processing Assembly). *[The WSTA should be filled to no more than 75%. Recycled water from the PWD may now be used by the crew for non-oral hygiene purposes.]*

At ~9:00am EST, the crewmembers conducted their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-Houston and TsUP-Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

For his selected VolSci (Voluntary Weekend Science) program featuring a dry run with SHERE (Shear History Extensional Rheology Experiment), CDR Fincke –

- Reviewed SHERE experiment procedures for familiarization,
- Activated the MSG (Microgravity Science Glovebox),
- Powered up the SHERE hardware,
- Accessed the CGBA (Commercial Generic Bioprocessing Apparatus) to install the SHERE FM (Fluid Module) #46,
- Conducted a SHERE dry run using the test (dry) FM,
- Removed the FM from the CGBA, followed by SHERE data transfer,
- Turned off the SHERE/CGBA equipment,
- Transferred the data files to the MSG laptop, and
- Powered down the MSG.

FE-2 Magnus completed the regular bi-monthly reboots of the OCA Router and File Server SSC (Station Support Computer) laptops.

For her own VolSci today, Sandy Magnus had chosen a Space Careers Demo EPO (Education Payload Operations), creating an educational video discussing different careers found at NASA, to be used to produce an educational product to enhance existing education resources for students in grades 9-12. Afterwards, the video hardware was stowed again. *[For the Demo, Sandy reviewed procedures, set up the SONY PD100 camcorder (without tape) and conducted the demo which was downlinked via Ku-band & S-band and recorded on the ground, discussing personal career paths, NASA-related careers, and other careers affiliated with equipment*

and experiments on ISS.]

The FE-2 performed periodic service on the WPA (Water Processing Assembly) by filling two CWC-Is (Iodinated Contingency Water Containers, #1010 & #1008) with iodinated water from the PWD (Potable Water Dispenser) auxiliary port.

Working from his discretionary “as time permits” task list, FE-1 Lonchakov performed a session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program, using the NIKON D2X digital camera to take telephotos. *[Uplinked target zones were the Kilimanjaro Volcano, the Nicaragua Pacific Coastline, noteworthy scenes of the Andes, and Patagonia Ice Field Glaciers.]*

Yuri’s voluntary task list also suggested another ECON KPT-3 session, making observations and taking aerial photography of Pacific Ocean surface contaminations for Russia's Environmental Safety Agency (ECON) using the D2X with SIGMA 300-800mm telephoto lens.

A third item on the “time permitting” task list for the FE-1 was to search for and collect hardware required for the externally installed OBSTANOVKA (Environment) experiment, including the Fluke 105B scopemeter with accessories, eight alkaline batteries for the scopemeter and the Elektronika-MMTs-1 Multimeter instrument. Four batteries were to be installed and both Fluke and MMTs-01 checked out. After a Langmuir Probe hardware familiarization review on 12/29, the first measurements of the plasma environment near the docked Soyuz spacecraft will be taken on 12/30 as part of the OBSTANOVKA experiment Part 1. *[The GFI-11/OBSTANOVKA payload, along with the IMPULSE experiment, will use ionosphere probes and a pulsed plasma source to make scientific measurements of ionosphere parameters and plasma-wave characteristics.]*

At ~1:40pm, Sandy had for a PFC (Private Family Conference), via S-band/audio and Ku-and/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

TOCA Software Update: Based on the aborted TOCA (Total Organic Carbon Analyzer) run on 12/24, an update to the TOCA software has been uplinked to the TOCA USB drive connected to the SSC-7 (Station Support Computer 7) laptop. Performing the software upgrade this weekend was added to Mike Fincke’s discretionary “job jar” task list. *[Although the upgrade is not mandatory for*

Monday's activities, it is highly desired as it will significantly increase the chances for a successful run.]

Weekly Science Update *(Expedition Eighteen -- Week 9)*

3-D SPACE: Complete.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Complete.

BCAT-3/4 (Binary Colloidal Alloy Test 3/4): Planned/Reserve.

BIO-4: Complete.

BIOLAB: Planned.

CARDIOCOG-2: Complete.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): In progress.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-3/CGBA-5 (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus 5): Ongoing.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

EDR (European Drawer Rack): On 12/23, additional check-out tests of the PCDF EU (Protein Crystallization Diagnostic Facility Electronic Unit) have been successfully performed. These tests included command scripts uplinked to EDR. The whole ground segment infrastructure is okay and is awaiting the launch of the PCDF PU (Process Unit) on 15A.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

ENose (Electronic Nose): "ENose is operating normally. As of 12/23/08, we have

downloaded data files twice. We have analyzed 2 weeks of data, and have found nothing unexpected in the breathing air."

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): Science acquisition for DEBIE-2, DOSTEL, EXPOSE, FIPEX, MEDET. On-ground troubleshooting for TRIBOLAB.

FSL (Fluid Science Laboratory): FSL is nominal.

GEOFLOW: For run#7, a higher corruption level of the downlinked data has been encountered, forcing the ground teams to postpone run#8 execution as scheduled on 12/22. In fact, the whole run#7 data set has been downlinked again on 12/22, still leading to some corrupted data but at different locations in the data stream. By merging the two downlinked data sets, the USOC teams have re-consolidated the run#7 in an acceptable way for the science teams. GEOFLOW science runs will be continued during the next weeks.

HDTV System Test DL (JAXA): Complete.

ICE CRYSTAL (JAXA): Ice Crystal experiment is going on. "This week, we have conducted 5 experiments during three nights from 12/23-12/24. Next run will be in next year, 1/5".

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Reserve.

Marangoni Experiment for ISS in JAXA FPEF (Fluid Physics Experiment Facility): In progress.

Micro-G Clay (JAXA EPO): Complete.

MISSE (Materials ISS Experiment): Ongoing.

Moon Photography from ISS (JAXA EPO): Complete.

MSG-SAME (Microgravity Science Glovebox): Complete.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

NOA-1/-2 (Nitric Oxide Analyzer, ESA): Complete.

NUTRITION w/REPOSITORY: In progress.

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PCRF (Protein Crystallization Research Facility) Reconfiguration (JAXA): Complete.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): “SHERE is looking forward to the VolSci experiment familiarization and Dry Run with you on Saturday, Mike!”

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): In progress.

SOLAR (Solar Monitoring Observatory): The next Sun observation window is planned to start around 12/26.

SOLO (Sodium Loading in Microgravity): Complete.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): Reserve.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1/#2 (Waving and Coiling of Arabidopsis Roots at Different g-levels): Complete/Planned.

CEO (Crew Earth Observations): Ongoing.

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/26/08
Date:	Friday, December 26, 2008 12:11:02 PM
Attachments:	

ISS On-Orbit Status 12/26/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Fincke & FE-2 Magnus started their day with another download of last night's data of the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment from their Actiwatches to the HRF-1 (Human Research Facility 1) laptop as part of the week-long session with SLEEP. *[To monitor the crewmember's sleep/wake patterns and light exposure, Mike & Sandy wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition and use the payload software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list. It was the second session for Mike, the first for Sandra.]*

In the DC1 Docking Compartment, FE-1 Lonchakov terminated the discharge cycle of the second 825M3 Orlan battery pack and removed it from the charger.

The FE-1 also finished stowing the tools taken out on the EVA-21 spacewalk and updated the IMS (Inventory Management System). CDR Fincke took care of the US equipment used for the EVA, putting it back in stowage in the US Airlock.

Later, Lonchakov & Fincke closed out the SM PkhO (Service Module Transfer Compartment) and DC1, restoring the compartments to their initial state.

The FE-1 then re-installed the MATRYOSHKA-R (RBO-3-2) radiation suite's LULIN-5 electronics box and the associated antroph-amorphous (human torso) "Phantom" unit in the DC1, followed by a brief checkout. *[The equipment had been temporarily stowed in the FGB. Data being accumulated by LULIN comprise measurement date, time, mode, three-directional flux data (per sq.cm per sec.), and three-directional dose rate.]*

Yuri also collected about an hour's worth of data of the Russian BIO-5 Rasteniya-1 ("Plants-1") experiment, with its BU Control Unit, for subsequent downlink to Earth as a checkout. *[Rasteniya-1 researches growth and development of plants under spaceflight conditions in the LADA-14 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP).]*

FE-2 Magnus printed out the instructions for the upcoming installation and subsequent activation & checkout (ACO) of the CMS ARED (Countermeasures System/ Advanced Resistive Exercise Device). Meanwhile, CDR Fincke transferred ARED components (6 bags, 3 items) from JAXA JLP (JEM Logistics Pressurized Segment) for temporary stowage in Node-1 to make room for the currently used IRED (Interim Resistive Exercise Device) in JLP.

Afterwards, Fincke & Magnus had an hour set aside for reviewing ARED installation and ACO procedures, followed by a 30 min. tagup with ground specialist via S-band/ audio & Ku-band/video to discuss the assembly activities next week.

Also in preparation of ARED installation Sandy set up two power tool batteries for the driver drill in the Lab for charging.

On ER2 (EXPRESS Rack 2), Magnus turned off the ENose (Electronic Nose) payload and relocated it to be independently powered from a Lab UOP (Utility Outlet Panel). *[ENose monitors the station's interior for harmful chemicals such as ammonia, mercury, methanol and formaldehyde, running continuously and autonomously. It is the first instrument aboard ISS which can detect and quantify chemical leaks or spills as they happen. If successful, ENose might be used in future space missions as part of an automated system to monitor and control astronauts' in-space environments. The shoebox-sized ENose contains an array of 32 sensors that can identify and quantify several organic and inorganic chemicals, including organic solvents and marker chemicals that signal the start of electrical fires. The sensors are polymer films that change their electrical conductivity in response to different chemicals, where the pattern of the sensor array's response depends on the particular chemical types present in the air. The instrument can analyze volatile aerosols and vapors, help monitor cleanup of chemical spills or leaks, and enable more intensive chemical analysis by collecting raw data and streaming it to a computer at JPL's ENose laboratory. The instrument, weighing less than nine pounds and requiring only 20 watts of power, has a wide range of chemical sensitivity, from fractional parts per million to 10,000 parts per million. Its data-analysis software can identify and quantify the release of chemicals within 40 minutes of detection. While ENose will look for 10 chemical types in this six-month experiment, it can be "trained" to detect many others.]*

The FE-2 then undertook another periodic relocation of the TEPC (Tissue Equivalent Proportional Counter) detector assembly, the primary radiation measurement tool in the ISS, today from the SM Panel 327 back to Node-2 inside the new portside CQ (Crew Quarters), utilizing UOP-3. *[TEPC had been moved to the SM by Fincke on 11/27, after having been in the Node-2 from 11/10.]*

In the Kibo JPM (JEM Pressurized Module), the CDR meanwhile performed Part 6 of the continuing troubleshooting of the CGSE (Common Gas Support Equipment), reconnecting the GBU (Gas Bottle Units) high-pressure QD (quick disconnect) for cycling, with CO_2 resupplied from the lower CGSE GBU, verifying proper line pressures via both lower and upper GBU pressure gauges to find the location of the suspected line blockage.

Sandy Magnus filled out the regular FFQ (Food Frequency Questionnaire), her fifth, on the MEC (Medical Equipment Computer). Mike Fincke's fourth FFQ activity is still on his "job jar" task list. *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

Afterwards, Sandy worked on the periodic inspection & cleaning of the FDS (Fire Detection & Suppression) system's SDs (smoke detectors) and bacterial filters in the US Airlock, Node-1, Node-2 and Lab. *[This activity, hard-scheduled for today, was listed yesterday among the "job jar" tasks as a discretionary item.]*

FE-1 Lonchakov collected the periodic readings of potentially harmful atmospheric contaminants in the SM, using the CMS (Countermeasure System), a component of the SKDS GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, today using preprogrammed microchips to measure for o-Xylol (1,2-Dimethylbenzol, C_8H_{10}) and Methyl-Mercaptan (Methanethiol, CH_4S).

Yuri also took the periodic readings with the Russian AOK GANK-4M instrument and calibrated the unit. *[AOK GANK-4M tests for Methane (CH_4), Ammonia (NH_3), Carbon Monoxide (CO), Formaldehyde (HCHO), Nitrogen Oxides (NO, NO_2), Hydrogen Chloride (HCl), Hydrogen Fluoride (HF), and Hydrogen Cyanide (HCN).]*

The FE-2 conducted the T+2d inflight microbiology analyses for the samples collected on 12/24 from the PWD (Potable Water Dispenser) Ambient plus SVO-ZV and SRV-K Warm taps. *[Sandy reported "yellow" for Coliform (= Negative), "130-ish purple dots" on the MCD (Microbial Capture Device) and a (nominal) incubation bag temperature of 80 degC. Photos were taken for return to Earth.]*

In the SM, the FE-1 completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

The daily IMS maintenance was performed by Sandy, consisting of updating/editing of its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

At ~3:15am EST, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~2:00pm, the ISS crew will have their regular weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC (Station Support Computer).]*

At ~4:30pm, Mike is scheduled for a PFC (Private Family Conference), via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 7:30am EST [= epoch]):

Mean altitude -- 353.7 km
Apogee height -- 358.9 km
Perigee height -- 348.6 km
Period -- 91.61 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.000768
Solar Beta Angle -- -27.0 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 74 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57879

Significant Events Ahead (all dates Eastern Time, some changes possible!):
01/14/09 -- ISS reboost w/SM thrusters
02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/12/09 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
08/06/09 -- STS-128/Discovery/17A – MPLM (P), LMC, last crew rotation
08/XX/09 -- Soyuz 5R/MRM2 (Russian Mini Research Module, MIM2) on Soyuz
09/XX/09 -- H-IIB (JAXA HTV-1)
11/12/09 -- STS-129/Atlantis/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P), LMC
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4
12/XX/11-- Proton 3R/MLM w/ERA.

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http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/25/08
Date:	Thursday, December 25, 2008 12:58:53 PM
Attachments:	

ISS On-Orbit Status 12/25/08

All ISS systems continue to function nominally, except those noted previously or below.

Merry Christmas!

CDR Fincke & FE-2 Magnus started their day with another download of last night's data of the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment from their Actiwatches to the HRF-1 (Human Research Facility 1) laptop as part of the week-long session with SLEEP. *[To monitor the crewmember's sleep/wake patterns and light exposure, Mike & Sandy wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition and use the payload software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list. It was the second session for Mike, the first for Sandra.]*

FE-1 Lonchakov performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM (Service Module), including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Yuri also completed the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the passageways PrK (SM Transfer Compartment)–PrK–RO (SM Working Compartment), PkhO (SM Transfer Compartment)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1.

In the DC1 Docking Compartment, the FE-1 terminated the discharge process on the first 825M3 Orlan battery pack in the ZU-S recharge unit and started it on the second set.

A newly added voluntary task for Mike Fincke & Sandy Magnus on their discretionary task list for today were the periodic inspection & cleaning of the FDS (Fire Detection & Suppression) system's SDs (smoke detectors) and bacteria filters in the US Airlock, Node-1, Node-2 and Lab.

As a second suggested task at her discretion, Sandy was to tear down and stow the BCAT-4 (Binary Colloid Alloy Test 4) hardware, including the 28V DC equipment and DCS-760 EarthKAM camera gear, which has been running in Node-2 since 12/20 as a VolSci (Voluntary Science) activity.

Filling out the regular FFQ (Food Frequency Questionnaire) for the fourth time on the MEC (Medical Equipment Computer) remains on Mike Fincke's "job jar" task list.

For talking with their families on the Christmas holiday, the CDR & FE-2 were scheduled for PFCs (Private Family Conferences), via S-band/audio and Ku-band/ MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Mike at ~12:40pm, Sandy at ~2:20pm EST.

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
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ISS Orbit (as of this morning, 8:38am EST [= epoch]):
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Apogee height -- 358.9 km
Perigee height -- 348.7 km
Period -- 91.62 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.000756
Solar Beta Angle -- -31.9 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 80 m

Revolutions since FGB/Zarya launch (Nov. 98) -- 57864

Significant Events Ahead (all dates Eastern Time, some changes possible!):
01/14/09 -- ISS reboost w/SM thrusters
02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/12/09 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
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Six-person crew on ISS
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12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P), LMC
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4
12/XX/11-- Proton 3R/MLM w/ERA.

Note: The daily ISS On-Orbit Status reports can also be found at
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/24/08
Date:	Wednesday, December 24, 2008 11:28:06 AM
Attachments:	

ISS On-Orbit Status 12/24/08

All ISS systems continue to function nominally, except those noted previously or below. ***Christmas Eve.*** *>>>Time seemed to stand still for a moment when 40 years ago today at ~5:00am ET in the morning, the crew of Apollo 8, Frank Borman, Jim Lovell and Bill Anders, fired the Service Module Propulsion System for 4 min 6.5 sec behind the Moon (i.e., out of our sight), beginning the first orbit (a 312 x 112 km ellipse) of their historical 10-orbit circumlunar exploration, humanity's greatest adventure of modern times. At 9:31pm in the evening (85h 40min Mission Elapsed Time), the crew took turns in reading opening passages from Genesis: "In the beginning God created heavens and the earth.....and God saw that it was good."<<<<*

CDR Fincke and FE-2 Magnus started their day by downloading the accumulated data of the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment from their Actiwatches to the HRF-1 (Human Research Facility 1) laptop as part of the week-long session with SLEEP. *[To monitor the crewmember's sleep/wake patterns and light exposure, Mike & Sandy wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition and use the payload software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list. It was the second session for Mike, the first for Sandra.]*

Fincke completed the standard 10-min post-EVA session of the medical PHS (Periodic Health Status) protocol, with Magnus assisting as CMO (Crew Medical Officer). *[The assessment is guided by the special IFEP software (In-Flight Examination Program) on the MEC (Medical Equipment Computer) laptop which also stores the data.]*

After wakeup, FE-1 Lonchakov's first task was to switch on the Russian POTOK-

150MK (150 micron) purification filter unit of the SOGS air revitalization subsystem in the SM (Service Module).

Fincke & Lonchakov cleaned up after the EVA-21 spacewalk. Specifically, they –

- Removed the BK-3 portable oxygen repressurization tanks (primary & backup) from the DC1 BSS (Orlan Interface Unit),
- Removed the BNP portable repress tank from the SM Work Compartment (RO) and stowed it,
- Removed the Orlan BRTA radio/telemetry unit batteries,
- Took post-EVA radiation readings of the “Pille-MKS” dosimeters carried by the spacewalkers in their Orlan suits,
- Put the EVA medical kits back in storage,
- Downlinked EVA-21 digital photography,
- Set up the first 825M3 Orlan battery for complete discharge/recharge,
- Removed the US EMU (Extravehicular Mobility Unit) lights & video camera from Yuri’s Orlan #26, and
- Configured the Orlan-M suits for drying out.

Later today, the Orlans and the BSS gear will be packed up and placed back in storage.

In the US Lab, Magnus took down the UOP DCP (Utility Outlet Panel/Display & Control Panel) bypass power cable to the VTR (Video Tape Recorder) at the Lab RWS (Robotics Work Station), used during the spacewalk with the SSRMS (Space Station Remote Manipulator System) TV cameras.

Afterwards, Sandy performed the regular periodic US WRS (Water Recovery System) sampling. *[After first setting up the TOCA (Total Organic Carbon Analyzer) by connecting its power cable to the UOP1 J3 outlet panel and hooking up its primed WPA (Water Processing Assembly) water sample hose to the WRS Rack 1, the FE-2 collected samples from the PWD (Potable Water Dispenser) Hot needle outlet for subsequent inflight processing with the TOCA plus WMK (Water Microbiology Kit) with MCD (Microbial Capture Device) and CDB (Coliform Detection Bag). After the analyses, the usual water reclamation from the sample bags via an absorbing towel (to be dried by airing) and data recording (from TOCA USB drive into the SSC7 laptop) concluded the activities. WRS sampling & checkouts are being conducted for 90 days, i.e., every 4 days: WRS water hose (TOCA inflight analysis) & microbial bag sample (inflight bacterial visual enumeration plus archival for return on 15A), every 8 days: an archival water sample (return on 15A), and monthly: a TOCA bag sample from PWD (tested inflight).]*

A new activity for Magnus today was the flushing of the WHC (Waste & Hygiene

Compartment) urine tank with a drink-bag full of non-iodinated water from the PWD. *[This activity will be performed every 10 days or so while the toilet is not in use. This will keep the WHC in good working order until it is used in January when KABIN (its privacy enclosure) is installed.]*

The FE-2 also completed the periodic status check on the running payloads CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) and ENose (Electronic Nose), both located in the ER-2 (EXPRESS Rack 2). *[ENose monitors the station's interior for harmful chemicals such as ammonia, mercury, methanol and formaldehyde, running continuously and autonomously. It is the first instrument aboard ISS which can detect and quantify chemical leaks or spills as they happen. If successful, ENose might be used in future space missions as part of an automated system to monitor and control astronauts' in-space environments. The shoebox-sized ENose contains an array of 32 sensors that can identify and quantify several organic and inorganic chemicals, including organic solvents and marker chemicals that signal the start of electrical fires. The sensors are polymer films that change their electrical conductivity in response to different chemicals, where the pattern of the sensor array's response depends on the particular chemical types present in the air. The instrument can analyze volatile aerosols and vapors, help monitor cleanup of chemical spills or leaks, and enable more intensive chemical analysis by collecting raw data and streaming it to a computer at JPL's ENose laboratory. The instrument, weighing less than nine pounds and requiring only 20 watts of power, has a wide range of chemical sensitivity, from fractional parts per million to 10,000 parts per million. Its data-analysis software can identify and quantify the release of chemicals within 40 minutes of detection. While ENose will look for 10 chemical types in this six-month experiment, it can be "trained" to detect many others.]*

Starting a new round of the monthly preventive maintenance of RS (Russian segment) ventilation systems, Magnus performed a 1h 15m inspection and cleaning of Group A ventilator fans and grilles in the SM.

Later, the FE-2 completed the weekly 10-min. CWC (Contingency Water Container) inventory as part of on-going WRM (Water Recovery & Management) assessment of onboard water supplies. Updated "cue cards" based on the crew's water calldowns are sent up every other week. *[The current card (18-0006H), to be updated, lists 39 CWCs (~1,250.9 L total) for the four types of water identified on board: technical water (673.8 L, for Elektron electrolysis), potable water (530.4 L, incl. 174.6 L currently off-limit because of* Wautersia *bacteria), condensate water (0.0 L), waste/EMU dump and other (46.7 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

Sandy also completed the routine daily servicing of the SM's SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

The daily IMS (Inventory Management System) maintenance was on Sandy's voluntary "job jar" task list for today, consisting of updating/editing of its standard "delta file" including stowage locations, for the regular weekly automated export/ import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew had their periodic PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Mike at ~11:00am, Yuri at ~11:20am, Sandy at ~11:40am EST.

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Working from his discretionary "time permitting" job list, Lonchakov conducted the frequent status check on the Russian BIO-5 Rasteniya-1 ("Plants-1") experiment, verifying proper operation of the BU Control Unit and MIS-LADA Module fans (testing their air flow by hand). *[Rasteniya-1 researches growth and development of plants under spaceflight conditions in the LADA-14 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP).]*

At ~10:30am EST, the ISS crew held their weekly teleconference with ISS Program Management at JSC/Houston via Ku-band/video & S-band/audio.

At ~2:30pm, CDR Fincke is scheduled for another 20-min. teleconference with Lee Archambault, CDR of the next Shuttle mission, STS-119/Endeavour-15A, in February.

CEO (Crew Earth Observations) photo targets uplinked for today were **Lake Nasser, Toshka Lakes, Egypt** *(aiming to the right of track for these lakes located in southern Egypt. Overlapping frames of both Lake Nasser and the smaller Toshka Lakes to the west were requested to track water levels and shoreline change),* and **Volcan Colima, Mexico** *(weather was predicted to be mostly clear over the Colima volcanic complex. Two large cones, Nevado de Colima and Volcan de Colima, are the most prominent features; small cinder cones are located on the valley floor to the west and east. Overlapping nadir frames of the two cones and adjacent valley floor were requested. Gray or white plumes may be observed from*

Volcan de Colima).

CEO photography can be studied at this “Gateway” website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

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Perigee height -- 348.8 km
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Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007539
Solar Beta Angle -- -36.8 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 78 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57848

Significant Events Ahead (all dates Eastern Time, some changes possible!):
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02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
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05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
08/06/09 -- STS-128/Discovery/17A – MPLM (P), LMC, last crew rotation
08/XX/09 -- Soyuz 5R/MRM2 (Russian Mini Research Module, MIM2) on Soyuz
09/XX/09 -- H-IIB (JAXA HTV-1)
11/12/09 -- STS-129/Atlantis/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P), LMC
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4

12/XX/11-- Proton 3R/MLM w/ERA.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/23/08
Date:	Tuesday, December 23, 2008 12:29:04 PM
Attachments:	

ISS On-Orbit Status 12/23/08

All ISS systems continue to function nominally, except those noted previously or below. *Crew rest day after the spacewalk. Crew sleep started this morning at 6:30am EST & ends tomorrow at 1:00am, returning the wake/sleep schedule back to normal.*

CDR Fincke & FE-1 Lonchakov's Orlan EVA-21 from the DC1 (Docking Compartment) airlock last night lasted 5 hrs 38 min. It was partially successful; some objectives were not achieved. The spacewalkers –

- Installed the Langmuir probe on the DC1 Docking Compartment (to measure electrical/plasma fields close to the docked Soyuz TMA-13 in support of the ongoing pyro bolt anomaly investigation);
- Removed/returned the BIORISK-MSN payload container #2 from the DC1;
- Installed & connected the IPI-SM monobloc unit of the Russian IMPULSE space experiment on the Service Module (large diameter), and
- Made a photographic survey of the ISS RS exterior & structure components ("Panorama-2008" DTO).

Mike & Yuri also installed the European EXPOSE-R payload on the SM shell (large diameter) but had to remove it again for return inside the ISS when it failed to activate and transmit telemetry on ground command.

The following tasks were then deferred for lack of time:

- Inspection & photography of the Progress 31P ASF1-M-VKA #2 antenna;
- Removing fasteners (Aramide straps) near docking target and AR-VKA & 2AR-VKA antenna areas on DC1;
- Closing MLI (Multi-Layer Insulation) flap on SM FP-10 connector patch panel, and
- Repositioning the SKK #9 removable cassette container to nominal position.

The spacewalk began at 7:51pm EST, 36 minutes late due to the pressure equalization valve (PEV; Russian: KVD) in the hatch between the spherical SM

PkhO (Transfer Compartment) and the DC1 SU (Transfer Vestibule) not opening on electric command (requiring FE-2 Magnus to enter the PkhO for manual cycling of the valve). The EVA ended at 1:29am. Subsequent repressurization of the DC1 from the SM PkhO failed when the KVD valve remained closed, even on an attempt by Sandy Magnus to open it manually from inside. The spacewalkers had to repressurize the DC1 from one of the backup BPN tanks (#7). The hatch could then be opened. The KVD valve suddenly became electrically functional again shortly before hatch opening (the second vestibule hatch, between the SU and the DC1 SO interior, could be opened OK during equalization).
[It was the 119th spacewalk for ISS assembly & maintenance and the 91st from the station (66 from Quest, 25 from Pirs, plus 28 from Shuttle) totaling 562h 44m; it was also the 19th this year. After today's EVA, a total of 159 spacewalkers (122 NASA astronauts, 26 Russians, and 11 astronauts representing Japan-1, Canada-4, France-1, Germany-2 and Sweden-3) have logged 751h 06min outside the station on building, outfitting & servicing. It was the 139th spacewalk involving U.S. astronauts.]

During EVA-21, FE-2 Magnus worked in Node-1, clearing out and transferring stowed equipment, relocating the SSC-6 (Station Support Computer 6) laptop and reconfiguring Node-1 UOP-2 (Utility Outlet Panel 2), all in preparation for next week's planned installation of the ARED (Advanced Resistive Exercise Device) which will block access to the NOD1P2 location.

Afterwards, Sandy replaced failed GLAs (General Luminaire Assemblies) in the JAXA Kibo modules, installing three BBAs (Baseplate Ballast Assemblies) & LHAs (Lamp Housing Assemblies) in the JLP (JEM Pressurized Logistics Segment) at locations FP1, FP2, PA2, and one BBA & LHA in the JPM (JEM Pressurized Module) at OF2.

After their return from the EVA this morning, Fincke & Lonchakov completed another session of the standard Russian crew health-monitoring program's medical assessment MO-9/Biochemical Urinalysis, after which Yuri restowed the Urolux equipment. *[MO-9 is conducted every 30 days (and also before and after EVAs) and is one of five nominal Russian medical tests adopted by NASA for U.S. crewmembers for IMG PHS (Integrated Medical Group/Periodic Health Status) evaluation as part of the "PHS/Without Blood Labs" exam. The analysis uses the sophisticated in-vitro diagnostic apparatus Urolux developed originally for the Mir program. Afterwards, the data are entered in the MEC (Medical Equipment Computer)'s special IFEP software (In-Flight Examination Program).]*

Later, Mike, Yuri & Sandy reset communications, conducted ISS activation operations and restored systems configurations in the DC1 & other RS modules to pre-EVA conditions, then installed DC1 and SM air ducts and activated the Vozdukh

CO_2 scrubber and Sputnik-SM amateur radio.

Cleaning up after the spacewalk, the CDR & FE-1 also –

- Secured the returned BIORISK-MSN payload container in a stowage bag for return to Earth,
- Removed the Orlan BRTA radio/telemetry unit batteries,
- Took post-EVA radiation readings of the "Pille-MKS" dosimeters carried by the spacewalkers in their Orlan suits,
- Deactivated the ASU toilet in the Soyuz spacecraft,
- Set up the Orlans for drying of their heat exchanger water supply lines, and
- Downlinked EVA-21 digital photography,

Bedtime began at 6:30am EST.

CEO (Crew Earth Observations) photo targets uplinked for today were **Johnston Island reef, central Pacific** *(ISS had a near-nadir pass over Johnston Island. Aiming slightly to the right of track for the island and adjacent reefs. Detailed imagery will add to the existing time series of information on the island-reef system, specifically change to shorelines and reef extent),* **American Samoa** *(weather was predicted to be mostly clear over the eastern Samoan archipelago - this portion of the island chain is not well-documented with imagery. Looking for several irregular and widely spaced-islands; the "lazy S" shaped island of Tutuila marks the western extent of American Samoa. Overlapping frames of the islands and fringing reefs were requested in order to track morphological changes over time),* and **Arkenu 1 and Arkenu 2 Impact Craters, Libya** *(the two Arkenu impact structures are located within approximately 6 km of each other and are thought to result from fragments of the same meteor. Both structures appear as dark, elliptical features surrounded by bright dune sands. ISS had a nadir pass over the craters; overlapping frames, taken along track as the station approached and then departed the target were recommended).*

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 7:44am EST [= epoch]):
Mean altitude -- 354.0 km
Apogee height -- 359.1 km
Perigee height -- 348.8 km
Period -- 91.62 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.000766

Solar Beta Angle -- -41.7 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 54 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57832

Significant Events Ahead (all dates Eastern Time, some changes possible!):
02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/12/09 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
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12/XX/11-- Proton 3R/MLM w/ERA.

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/22/08
Date:	Monday, December 22, 2008 12:19:20 PM
Attachments:	

ISS On-Orbit Status 12/22/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 9 of Increment 18. Today's crew activities are centered mostly on tonight's Orlan EVA-21.*

Crew Sleep Cycle: Wakeup this morning: 10:45am EST; sleep: 6:30am tomorrow morning (until 12/24/Wednesday, 1:00am, i.e., back to normal).

FE-2 Magnus & CDR Fincke started their day again with the week-long SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment, using the payload software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop. *[To monitor the crewmember's sleep/wake patterns and light exposure, the crewmembers wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition and use the payload software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list. It was the second session for Mike, the first for Sandra.]*

After morning inspection, all pre-EVA activities proceeded smoothly and on schedule, starting out with Fincke & Lonchakov taking another MO-9 "Urolux" urine biochemistry test before breakfast. *[A second session with the Urolux equipment will be conducted by both crewmembers tomorrow morning (~2:30am) immediately after post-EVA station repress.]*

Pre-EVA preparations by the crew included –

- Closing the external shutters on the Lab and JPM (JEM Pressurized Module) science windows,
- Verifying that windows 6, 8, 9 of the SM RO (Service Module Work Compartment) and 12, 13, 14 of the SM PkhO (Transfer Compartment) are

closed,

- Deactivating the Kenwood-D700/Sputnik-SM amateur radio equipment in the FGB to prevent RF interference with the Orlans' wireless in-suit Tranzit-B radio telemetry system,
- Changing the settings of the DSP pressure alarm sensors in the RS (Russian Segment),
- Deactivating the DS-7A Smoke Detector #1 in the SM PkhO,
- Setting up the PSS Caution & Warning System in the FGB,
- Deactivating the Vozdukh carbon dioxide (CO_2) removal system and the SKV air conditioner,
- Removing SM air ducts to enable RO-PkhO hatch closure,
- Deactivating VN1 & VN2 air heaters,
- Powering down ventilation fans in the SM (VK1, VK2, VK3, VK4, VKYu1, VKYu2),
- Turning off the SRVK-2M condensate water processor, and
- Powering off the electrical food heaters in the SM galley.

Mike Fincke & Yuri Lonchakov had about an hour reserved to complete setting up DC1 and PkhO systems for pre-EVA mode.

Next steps by Yuri & Mike were to –

- Check out the Orlan-M spacesuits and their systems as well as the suit interface control panels (BSS) in DC1 & PkhO,
- Retest the BK-3 primary & backup oxygen (O_2) tanks of the Orlans and DC1 (four total),
- Disassemble the DC1 air duct, but leaving the V3 fan in place, and
- Set up the STTS communications/telemetry links necessary for the spacewalk from the DC1. *[Most activities were paced by RGS (Russian ground site) comm window passes.]*

The CDR also test-"fired" the two D2X digital cameras and readied them in the DC1 for the spacewalk.

As a late-added activity, FE-2 Magnus reconfigured the WRS WPA (Water Recovery System/Water Processor Assembly) tank connection in the Lab, switching the waste/condensate water bus from the WRS tank to the Lab condensate tank. *[This reconfiguration became necessary when the WPA tank quantity yesterday exceeded an upper limit of 91%. A max filling of 95% will cause an overfill fault and shutdown of the WPA due of insufficient ullage. Since the deactivation of the Russian SKV air conditioner for the EVA is accelerating the filling rate, switching to the Lab condensate tank today became a necessary workaround. The UPA (Urine Processor Assembly) is currently shut down.]*

Also currently deactivated, by ground commanding at ~11:00am, is the CDRA (Carbon Dioxide Removal Assembly) in the Lab.

After a midday “snack” (3:10-3:50pm), the spacewalkers, assisted by FE-2 Magnus, will conduct final inspections of the Orlan-M suits, BSS interface units & biomedical parameter telemetry to RGS (Russian Groundsite), including VHF/voice & biomedical electrode belt and telemetry hookups via the BSS (later by the wireless in-suit Tranzit-B radio telemetry system) for vital signs and equipment monitoring.

Magnus will configure the ISS for pre-EVA condition and support the spacewalkers in their preparations.

At ~5:00pm, in the DC1 & PkhO, after the Orlan & BSS systems checkouts Lonchakov & Fincke will be donning spacesuits and ancillary gear, assisting each other, then – with Sandy in the PkhO – close the hatchways between SM RO/PkhO and PkhO/SU (DC1 Transfer Vestibule) at ~5:35pm.

Magnus retreats into the FGB at ~6:20pm and closes the hatch to the SM, which now serves as a backup airlock to the DC1.

At ~4:50pm, ISS attitude control authority will be handed over to RS MCS (Motion Control System) to keep attitude stable during the (reactive) DC1 airlock depressurization. Then, the ISS will maneuver to a new EVA TEA (Torque Equilibrium Attitude), required due to the Port SARJ (Solar Alpha Rotary Joint) being moded from Autotrack to Parked position for the EVA. At 7:55pm, control will be returned to US Momentum Management to allow inhibiting Russian thrusters for safe work on the SM large diameter section. Thrusters will then be re-enabled (~12:32am). The US CMGs (Control Moment Gyroscopes) will be back in business tomorrow for the transition of the Port SARJ back to Autotrack (~10:40am).

The spacewalkers are scheduled to seal the Orlan backpacks at ~5:30pm, followed by Orlan & BSS controls checks. Final checkout of suits and their controls include checking for leaks during successive stages of depressurization. *[Pressure inside the Orlans will be reduced to 0.42 at (6.2 psi). After suit purge, the spacewalkers have a 30-minute oxygen prebreathe period, as pressures between DC-1 and the PkhO are equalized and then reduced further.]*

The spacewalk will begin after a final leak check on the four BK-3 O_2 tanks. At end of prebreathe, DC1 pressure will be down to 15 mmHg (Torr), holding for 5 min for a final cabin leak check, followed by switching the Orlans to autonomous (battery) suit power (~7:12pm) and opening of EV hatch #1 at ~7:15pm.

During the EVA-21, Sandy Magnus is scheduled for a 2.5-hour activity in Node-1, clearing out and transferring stowed equipment as well as relocating Node-1 UOP (Utility Outlet Panel) plug-ins in preparation for next week's planned installation of the ARED (Advanced Resistive Exercise Device).

Afterwards, Sandy will work in the Kibo modules and install three BBAs (Baseplate Ballast Assemblies) & LHAs (Lamp Housing Assemblies) in the JLP (JEM Pressurized Logistics Segment) at locations FP1, FP2, PA2, and one BBA & LHA in the JPM (JEM Pressurized Module) at OF2.

After Mike & Yuri's return and ingress from the EVA, expected tomorrow morning at around 1:25am, the DC1 airlock will be repressurized from SM cabin air, the hatches opened and the SM re-entered at around 2:05am.

Later, Fincke, Lonchakov and Magnus will reset communications, conduct ISS activation operations and restore systems configurations in the DC1 and other RS modules to pre-EVA conditions, then install DC1 and SM air ducts and activate the Vozdukh CO_2 scrubber and Sputnik-SM amateur radio.

Cleaning up after the spacewalk, the CDR & FE-1 will –

- Secure the returned BIORISK-MSN payload container in a stowage bag for return to Earth,
- Remove the Orlan BRTA radio/telemetry unit batteries,
- Take post-EVA radiation readings of the "Pille-MKS" dosimeters carried by the spacewalkers in their Orlan suits,
- Deactivate the ASU toilet in the Soyuz spacecraft,
- Set up the Orlans for drying of their heat exchanger water supply lines, and
- Downlink EVA-21 digital photography,

Sandy Magnus is timelined for her regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer and RED resistive exercise device.

EVA-21 Timeline Preview: The EVA-21 by Lonchakov (EV1/blue stripe) & Fincke (EV2/red stripe) today is scheduled to begin at ~7:15pm EST (DC1 EV hatch open), to last an estimated 6 hrs 10 min, i.e., concluding at approximately 1:25am. Russian attitude thrusters will be inhibited by TsUP ground commanding at specific times when the spacewalkers work on the SM RO large diameter (l.d.) and SM AO (Assembly Compartment). Main objectives of the EVA are to –

- *Install a Langmuir Probe on the DC1 Docking Compartment (to measure plasma fields close to Soyuz in support of the ongoing pyro bolt anomaly*

investigation);

- *Install & connect the EXPOSE-R monobloc unit on the SM RO l.d.;*
- *Install & connect the IPI-SM monobloc unit of the IMPULSE space experiment on the RO l.d.;*
- *Remove/return the BIORISK-MSN payload container #2 from the DC1;*
- *Conduct "SWG" Omega watch experiment operations;*
- *Inspect & photograph Progress 31P ASF1-M-VKA #2 antenna;*
- *Remove fasteners (Aramide straps) near docking target and AR-VKA & 2AR-VKA antenna areas on DC1(if time permits);*
- *Close MLI (Multi-Layer Insulation) flap on SM FP-10 connector patch (if time permits);*
- *Re-install SKK #9 removable cassette container in nominal position (if time permits); and*
- *Monitor conditions ISS RS exterior and structure components ("Panorama-2008" DTO, if time permits).*

Correction: Due to EVA-caused timeline constraints, the crew had to cancel the planned multi-language Christmas Day Message announced here yesterday. However, the 40-year Apollo 8 Anniversary on 12/24 will be commemorated with a previously recorded message.

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 8:39am EST [= epoch]):
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Perigee height -- 348.8 km
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Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007788
Solar Beta Angle -- -46.5 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 41 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57817

Significant Events Ahead (all dates Eastern Time, some changes possible!):
12/22/08 -- Russian EVA-21 (hatch opening ~7:15pm; ingress 1:25am);
02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch

02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/12/09 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch

Six-person crew on ISS

08/06/09 -- STS-128/Discovery/17A – MPLM (P), LMC, last crew rotation
08/XX/09 -- Soyuz 5R/MRM2 (Russian Mini Research Module, MIM2) on Soyuz
09/XX/09 -- H-IIB (JAXA HTV-1)
11/12/09 -- STS-129/Atlantis/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P), LMC
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4
12/XX/11-- Proton 3R/MLM w/ERA.

Note: The daily ISS On-Orbit Status reports can also be found at
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/21/08
Date:	Sunday, December 21, 2008 1:14:18 PM
Attachments:	

ISS On-Orbit Status 12/21/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – pre-EVA rest day for CDR Fincke, FE-1 Lonchakov & FE-2 Magnus. Ahead: Week 9 of Increment 18.*

>>>This morning at 7:04am EST, Winter began officially.

*>>>Today 40 years ago, humankind broke the taboo of Earth constraints and fulfilled a millennia-old dream when, at 7:51am EST, Frank Borman, Jim Lovell and Bill Anders launched at KSC to break away from Earth in **Apollo 8** and head for the Moon. "This is not the end but the beginning…" said NASA Administrator Dr. Thomas Paine (act.).*

CDR Fincke & FE-2 Magnus started their day by downloading the accumulated data of the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment from their Actiwatches to the HRF-1 (Human Research Facility 1) laptop as part of the week-long session with SLEEP. *[To monitor the crewmember's sleep/wake patterns and light exposure, the crewmembers wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition and use the payload software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list. It was the second session for Mike, the first for Sandra.]*

After wakeup, before breakfast & first exercise, Mike Fincke, with Sandy Magnus assisting as CMO (Crew Medical Officer), completed a pre-EVA session with the Russian crew health-monitoring program's medical assessment MO-9/Biochemical Urinalysis. *[MO-9 is conducted every 30 days (and also before and after EVAs) and is one of five nominal Russian medical tests adopted by NASA for U.S. crewmembers for IMG PHS (Integrated Medical Group/Periodic Health Status)*

evaluation as part of the "PHS/Without Blood Labs" exam. The analysis uses the sophisticated in-vitro diagnostic apparatus Urolux developed originally for the Mir program. Afterwards, the data are entered in the MEC (Medical Equipment Computer)'s special IFEP software (In-Flight Examination Program).]

Afterwards, the CDR –

- Set up the batteries of the D2X cameras for tomorrow's Orlan EVA-21 in the US Airlock for charging and later terminated the process after a minimum of 3 hours charging, and
- Filled the DIDBs (Disposable In-suit Drink Bags) and installed them in the Orlan-M suits.

Also in preparation for the Russian spacewalk, FE-1 Lonchakov –

- Functionally tested the hatch KVDs (pressure equalization valves, U.S.: PEVs) in the DC1 and Service Module Transfer Compartment (SM PkhO) from their EVA support panels (POV);
- Configured the CCPK (Crew Contamination Protection Kit, Russian: PNST) in the DC1, for protecting the spacewalkers from FORP (Fuel/Oxidizer Reaction Products, e.g., N-nitrosodimethylamine, NDMA), i.e., incompletely-burnt fuel residue on the SM hull from yaw/pitch thruster plumes *[the protective gear kits for use during and after the EVA in case the Orlans are inadvertently contaminated, are extensively equipped with wet wipes, dry towels, goggles, IPK gas masks and half masks, latex gloves, high performance filters, trash containers, etc. Towels used for wiping gloves etc. will be thrown overboard in retrograde direction (i.e., against flight direction)],*
- Retrieved three "Pille-MKS" radiation dosimeters, recording their dosages and equipping each Orlan (in pocket on left calf) with a sensor unit (A0309 & A0310) *[a third sensor, A0308, remains on duty for SM background readings on the Pille Reader tray]*; and
- Activated the ASU toilet system in the Soyuz spacecraft (for use by the FE-2 during the SM lockout).

Lonchakov performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. Additionally, the FE-1 today checked up on the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem, gathering weekly data on total operating time & "On" durations for reporting to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

In preparation for the EVA, Yuri also supported the ground in powering down the Elektron-VM oxygen (O_2) generator, safety-purging its BZh Liquid Unit with nitrogen (N_2) at 0.65 kg/cm^2 via its KE3 and VN3 valves.

For the external video coverage of the spacewalk, FE-2 Magnus set up the SSRMS (Space Station Remote Manipulator System) video camera connection by hooking up the UOP DCP (Utility Outlet Panel/Display & Control Panel) power bypass cable at the Lab RWS (Cupola Robotic Work Station).

Sandy also recorded TOCA (Total Organic Carbon Analyzer) results and conducted the T+2d inflight microbiology analyses for the samples collected on 12/19 from the PWD (Potable Water Dispenser) Ambient plus SVO-ZV and SRV-K Warm taps. *[Sandy reported "yellow" for Coliform (= Negative), "no purple dots" on the MCD (Microbial Capture Device) and a (nominal) incubation bag temperature of 80 degC. "All was OK..."]*

Fincke & Lonchakov had their pre-EVA PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Mike at ~10:10am, Yuri at ~11:30am EST.

At ~12:25pm, Mike held his weekly PFC (Private Family Conference) via S-band/ audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Working from his discretionary "time permitting" job list, Yuri Lonchakov conducted the frequent status check on the Russian BIO-5 Rasteniya-1 ("Plants-1") experiment, verifying proper operation of the BU Control Unit and MIS-LADA Module fans (testing their air flow by hand). *[Rasteniya-1 researches growth and development of plants under spaceflight conditions in the LADA-14 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP).]*

EVA-21 Timeline Preview: The Orlan EVA-21 by Lonchakov (EV1/blue stripe) & Fincke (EV2/red stripe) tomorrow is scheduled to begin at ~7:15pm EST (DC1 EV hatch open), to last an estimated 6 hrs 10 min, i.e., concluding at approximately 1:25am. Russian attitude thrusters will be inhibited by TsUP ground commanding at specific times when the spacewalkers work on the SM RO (Working Compartment, l.d./large diameter) and SM AO (Assembly Compartment). Main

objectives of the EVA are to –

- *Install a Langmuir Probe on the DC1 Docking Compartment;*
- *Install & connect the EXPOSE-R monobloc unit on the SM RO l.d.;*
- *Install & connect the IPI-SM monobloc unit of the IMPULSE space experiment on the RO l.d.;*
- *Remove/return the BIORISK-MSN payload container #2 from the DC1;*
- *Conduct "SWG" Omega watch experiment operations;*
- *Inspect & photograph Progress 31P ASF1-M-VKA #2 antenna;*
- *Remove fasteners (Aramide straps) near docking target and AR-VKA & 2AR-VKA antenna areas on DC1(if time permits);*
- *Close MLI (Multi-Layer Insulation) flap on SM FP-10 connector patch (if time permits);*
- *Re-install SKK #9 removable cassette container in nominal position (if time permits); and*
- *Monitor conditions ISS RS exterior and structure components ("Panorama-2008" DTO, if time permits).*

Crew Sleep Cycle Shift (EST):

- Sleep tonight (12/21): -- 4:30pm
- Wake (12/22, Mon.) -- 10:45am
- Sleep (12/23, Tues.): -- 6:30am
- Wake (12/24, Wed.): -- 1:00am (nominal).

Christmas Day Message: On 12/24, the day when trailblazing Apollo 8 arrived in lunar orbit 40 years ago, the ISS crew will downlink a message commemorating the event and extending "Peace" wishes to all countries partnering in the ISS, in their languages:
English (Peace), Russian (Mir), Japanese (Heiwa), French (Paix), Dutch (Vrede), German (Friede), Danish/Norwegian/Swedish (Fred), Italian (Pace), Spanish (Paz).
Let your neighbors know!

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 8:25am EST [= epoch]):
Mean altitude -- 354.0 km
Apogee height -- 359.3 km
Perigee height -- 348.8 km
Period -- 91.62 min.
Inclination (to Equator) -- 51.64 deg

Eccentricity -- 0.0007782
Solar Beta Angle -- -51.4 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 49 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57801

Significant Events Ahead (all dates Eastern Time, some changes possible!):
12/22/08 -- Russian EVA-21 (hatch opening ~7:15pm; ingress 1:25am);
02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/12/09 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
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Six-person crew on ISS
08/06/09 -- STS-128/Discovery/17A – MPLM (P), LMC, last crew rotation
08/XX/09 -- Soyuz 5R/MRM2 (Russian Mini Research Module, MIM2) on Soyuz
09/XX/09 -- H-IIB (JAXA HTV-1)
11/12/09 -- STS-129/Atlantis/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P), LMC
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4
12/XX/11-- Proton 3R/MLM w/ERA.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/20/08
Date:	Saturday, December 20, 2008 3:52:37 PM
Attachments:	

ISS On-Orbit Status 12/20/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – rest day for CDR Fincke, FE-1 Lonchakov & FE-2 Magnus.*

The crew started out with a 2-hr. review of the updated timeline and procedures for the Orlan EVA-21 on 12/22 (Monday), including tagging up with ground specialists at TsUP-Moscow to discuss specifics based on uplinked instructional material on execution sequences of selected tasks. *(See timeline below).*

For her VolSci (Voluntary Science) program session today, FE-2 Magnus configured the BCAT-4 (Binary Colloid Alloy Test 4) payload in the Node-2, checked it out and started the experiment. *[After first familiarizing herself with payload hardware & operations, Sandy set up the experiment along with camcorder and still camera, taking video of herself performing homogenization on sample 2, the first crystal check of the session on sample 10, still imagery of any crystals found plus sample photography. The FE-2 then initiated the activity of automated photography of sample 2 with the Kodak DCS-760 digital still camera controlled by the EarthKAM software running on an SSC-13 (Station Support Computer 13).]*

At ~9:00am EST, the crewmembers conducted their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-Houston and TsUP-Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

Continuing the extended leak checking of the spare BZh Liquid Unit (#056) for the Elektron O_2 generator, FE-1 Lonchakov charged the unit once again with pressurized N_2 from the BPA Nitrogen Purge Unit (#23) to 1 atm (1 kg/cm^2). The last test pressurization to monitor for leakage was on 11/20. *[Objective of the monthly checkout of the BZh, which has been in stowage for about 2 years, is to check for leakage and good water passage through the feed line inside of the BZh*

(from ZL1 connector to the buffer tank) and to check the response of the Electronics Unit's micro switches (signaling "Buffer Tank is Empty" & "Buffer Tank is Full". During Elektron operation, the inert gas locked up in the BZh has the purpose to prevent dangerous O_2/H_2 mixing. A leaking BZh cannot be used.]

In the SM (Service Module), Yuri also completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Sandy Magnus filled out the regular FFQ (Food Frequency Questionnaire), her fourth, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

Port CQ Update: After the extensive deployment & checkout activities on the Portside Crew Quarters in Node-2 by CDR Fincke & FE-2 Magnus, the CQ has been determined to be habitable, and the crew was given permission to sleep in it. A few remaining tasks need to be completed, scheduled for the week of 1/5/09. Starboard CQ outfitting will be undertaken following the Port CQ completion.

VOA Update: After the recent VOA OMIs (Volatile Organics Analyzer/On-orbit Maintenance Items) spares changeout activities by Sandy Magnus, ground specialists are still investigating why they cannot get VOA back up and running. While an issue with the hard drive is being suspected, a complete troubleshooting plan is currently being put together.

EVA-21 Timeline Preview: The Orlan EVA-21 by Lonchakov (EV1/blue stripe) & Fincke (EV2/red stripe) on 12/22 is scheduled to begin at ~7:15pm EST (DC1 EV

hatch open), to last an estimated 6 hrs 10 min, i.e., concluding at approximately 1:25am. Russian attitude thrusters will be inhibited by TsUP ground commanding at specific times when the spacewalkers work on the SM RO (Working Compartment, l.d./large diameter) and SM AO (Assembly Compartment). Main objectives of the EVA are –

- *Install a Langmuir Probe on the DC1 Docking Compartment;*
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- *Install & connect the IPI-SM monobloc unit of the IMPULSE space experiment on the RO l.d.;*
- *Remove/return the BIORISK-MSN payload container #2 from the DC1;*
- *Conduct "SWG" project timer operations;*
- *Inspect & photograph Progress 31P ASF1-M-VKA #2 antenna;*
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- *Close MLI (Multi-Layer Insulation) flap on SM FP-10 connector patch (if time permits);*
- *Re-install SKK #9 removable cassette container in nominal position (if time permits); and*
- *Monitor conditions ISS RS exterior and structure components ("Panorama-2008" DTO, if time permits).*

Weekly Science Update *(Expedition Eighteen -- Week 8)*

3-D SPACE: Complete.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Complete.

BCAT-3/4 (Binary Colloidal Alloy Test 3/4): Planned/Reserve.

BIO-4: Complete.

BIOLAB: Planned.

CARDIOCOG-2: Complete.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): "Sandy, thanks for selecting and completing your first CCISS session as a Voluntary Science option. We appreciate your participation."

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-3/CGBA-5 (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus 5): Ongoing.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

EDR (European Drawer Rack): Planned.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): Science acquisition for DEBIE-2, DOSTEL, EXPOSE, FIPEX, MEDET. On-ground troubleshooting for TRIBOLAB.

FSL (Fluid Science Laboratory): FSL is nominal.

GEOFLOW: "Sandy, thanks for increasing the torque of the FSL Anti-Vibration Mount (AVM), so that it is not necessary to lock/unlock the FSL Facility Core Element (FCE) for ISS reboost events. Science run #5, run#6 and run#7 have been successfully performed on 12/11, 12/16 and 12/18 respectively. All data have been downlinked and new science runs are planned in the next weeks"

HDTV System Test DL (JAXA): Complete.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

ICE CRYSTAL (JAXA): The experiment is ongoing and nominal.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Reserve.

Marangoni Experiment for ISS in JAXA FPEF (Fluid Physics Experiment Facility): In progress.

Micro-G Clay (JAXA EPO): Complete.

MISSE (Materials ISS Experiment): Ongoing.

Moon Photography from ISS (JAXA EPO): Complete.

MSG-SAME (Microgravity Science Glovebox): Complete.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

NOA-1/-2 (Nitric Oxide Analyzer, ESA): Complete.

NUTRITION w/REPOSITORY: “Mike and Sandy, Thanks for the great work in completing your FD60 and FD30 sessions. The crew notes you both sent down were very helpful, and the Nutrition team appreciates the attention to detail!”

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PCRF (Protein Crystallization Research Facility) Reconfiguration (JAXA): Complete.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): Planned.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): “Sandy, thanks for donning your Actiwatch on the Shuttle. Your remaining Sleep Activities include monthly downloads of your Actiwatch, three weeks of sleep logging, and doffing the Actiwatch on the Shuttle on your way home. We are currently targeting

next week for your first week of Sleep logging. Any additional sleep logging is above and beyond and greatly appreciated by the PI.
Mike, thanks for downloading your and Sandy's Actiwatches as Voluntary Science. Choosing this option prevented a loss of data from Sandy's Actiwatch filling up and stopping recording. We are currently targeting next week for your first week of Sleep logging. In progress."

SOLAR (Solar Monitoring Observatory): The next Sun observation window is planned to start around 12/26.

SOLO (Sodium Loading in Microgravity): Complete.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): Reserve.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1/#2 (Waving and Coiling of Arabidopsis Roots at Different g-levels): Complete/Planned.

CEO (Crew Earth Observations): "Through 12/17 we have received a total of 5,608 frames of your CEO imagery for review and cataloging. Photos with times corresponding to our CEO target request times are reviewed first and since last week included: Aurora Australis – 28 frames in two sessions – no Aurora noted; and the Pilcomayo River & Megafan, Paraguay – 3 frames – target not acquired due to inadequate illumination (our bad). You acquired excellent imagery earlier of Mount Vesuvius (both with and without snow). You also acquired great contextual imagery of Lake Poopo (apparently bone dry – first time observed this decade). Recent aurora viewing conditions were poor, at best. Thanks for looking and trying. You did get some beautiful 400mm views of the Moon. You also recently acquired imagery of agricultural areas near the Rio Parapeti in Bolivia. A comparison of your image with one from STS-73 in 1995 will be published in NASA/GSFC's Earth Observatory website this weekend. The comparison illustrates the dramatic expansion of agricultural activity by the Bolivians into their rainforest region. Nice work!"

CEO photo targets uplinked for today were **South Tibesti Megafans, Africa** *(ISS had a nadir pass over the Ke River megafan, a large ancient river channel system south of the Tibesti Mts. Looking for a discontinuous, overlapping pattern of stream*

channels south of the mountains. While the area is now part of the arid Sahara of southern Libya/northern Chad, approximately 8000 years ago the climate was much wetter and active rivers flowed here. The South Tibesti megafans represent a potential analog to features observed on Mars), **Tenoumer Impact Crater, Mauritania** *(looking slightly to the right of track for this well-preserved, 2 km diameter impact crater. Looking for a dark circular structure to the east and north of two large dune fields with striking parallel dune sets. Overlapping frames taken slight to the right of track are suggested to capture the crater),* and **Popocatepetl Volcano, Mexico** *(weather was predicted to be clear over this large stratovolcano located 70 km to the southeast of Mexico City. Three major explosive eruptions have occurred in the very recent geologic past, producing pyroclastic flows and lahars that affected the basins surrounding the volcano. Mapping frames of the volcano and flanks are requested to capture current summit glacier extent and cone geomorphology. Gas and steam emissions may also be observed at the volcano).*

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

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02/10/09 -- Progress 32P launch
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02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
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04/07/09 -- Progress 32P undocking & deorbit
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Six-person crew on ISS

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05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4
12/XX/11-- Proton 3R/MLM w/ERA.

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/19/08
Date:	Friday, December 19, 2008 2:25:43 PM
Attachments:	

ISS On-Orbit Status 12/19/08

All ISS systems continue to function nominally, except those noted previously or below. *Crew sleep cycle today: Wake – 4:30am; sleep – 3:00pm EST. (Tomorrow: Wake – 1:00am; sleep – 4:30pm, i.e., back to normal).*

After yesterday's completion of all Orlan-M suit preparations, dry-run activities began today at ~1:25am EST with CDR Fincke tearing down and removing the air ducts between the SM PkhO (Service Module Transfer Compartment) and DC1 Docking Compartment/airlock (skipping ventilation fan V3) to make room for the subsequent suited exercise.

At the same time, FE-1 Lonchakov worked on configuring the communications systems in the DC1 for the exercise. *[The suited run requires wireless Tranzit-B suit radio telemetry on both semisets (activated: 2:56am) and temporary deactivation of the Russian VHF channel 1 (Very High Frequency, Russian: UKV1, for ultra-shortwave) to avoid interference from extraneous radio stations to the Orlans while over Russian ground stations (RGS, DO 3/4). All EVA preps were monitored by the ground via audio, the reason for the early morning time of the training run. Tranzit-B TM was turned off at ~3:10am EST.]*

After another functionality and leak checking of the Orlan-Ms, their equipment and their interface units (BSS) in the DC1 & PkhO, the crew began donning EVA gear at ~2:15am, including putting on personal gear bags, biomed harness, thermal underwear, LCG (liquid cooling garment), low-noise headset, gloves, etc.

After another checkout of comm hookups & biomedical parameter telemetry via the BSS Orlan interface system for vital signs & equipment monitoring, suiting up then culminated in ingress in the Orlans (~3:15am) through their "backdoors" and sealing off of the backpacks.

Next in line were –

- More functionality checkouts of the suits and their BSS controls (e.g.,

temperature control handling, water cooling system ops, preliminary Orlan & BSS leak checks),

- Preliminary dimensional suit fit checks at reduced suit pressure of 0.4 at/5.9 psi, and
- About an hour of testing/training of suited mobility & translation inside the DC1, beginning at ~3:55am.

[These "intramural" exercises included translation to all DC1 work stations with mated fluid umbilical, assessment of how the interior DC1 config impacts operations with various gear & accessories such as the POV (EVA support panel) and BSS, moving the BRT (Body Restraint Tether) with a CLB (Crew Lock Bag) and securing the BRT on a handrail, retrieving the Kodak 760 camera from the KPU tool carrier and stowing it temporarily on the OTA swing arm, turning helmet lights & Yuri's WVS (Wireless Video System) camera on and off, etc.]

FE-2 Magnus participated in part of the exercise by checking out her comm links.

Egress from the Orlans was at about 5:00am, followed by a one-hour lunch break.

Afterwards, Lonchakov & Fincke restored communications settings in DC1 to nominal ops and performed post-training close-out activities, including air duct assembly. Later, after the Orlans were confirmed to be dry, they were re-equipped by Mike & Yuri with fresh consumables/replaceable elements for the spacewalk on Monday.

Meanwhile, Sandra Magnus spent more time with the periodic US WRS (Water Recovery System) sample analyses. *[After first setting up the TOCA (Total Organic Carbon Analyzer) by connecting its power cable to the UOP1 J3 outlet panel and hooking up its primed WPA (Water Processing Assembly) water sample hose to the WRS Rack 1, the FE-2 collected samples from the PWD (Potable Water Dispenser) Hot needle outlet for subsequent inflight processing with the TOCA plus WMK (Water Microbiology Kit) with MCD (Microbial Capture Device) and CDB (Coliform Detection Bag). A PWD post-flight analysis sample was archived for return on 15A. After the analyses, the usual water reclamation from the sample bags via an absorbing towel (to be dried by airing) and data recording (from TOCA USB drive into the SSC7 laptop) concluded the activities.]*

Magnus also offloaded accumulated urine from a Russian EDV-U container (#851) into the UPA. *[EDV-U #851, approaching expiration, is being replaced by #810.]*

In JAXA's Kibo JPM (JEM Pressurized Module), the FE-2 supported SSIPC (Space Station Integration & Promotion Center) at Tsukuba/Japan in troubleshooting the MMA (Microgravity Measurement Apparatus) by activating the UDC (Utility DC/DC Converter) and MMA components at the Ryutai Rack and standing by for

power-cycling the NCU (Network Control Unit) if required. About 7.5 hrs later, Sandy deactivated the MMA again (~12:40pm EST).

Also in Kibo, Magnus performed troubleshooting on the JEM CGSE (Common Gas Support Equipment) by connecting the upper & lower CO_2 supply lines from the GBUs (Gas Bottle Units) and checking pressure readings to track down a suspected blockage.

For the Japanese ICE CRYSTAL (Study of Microgravity Effect for Pattern Formation of Dendritic Crystal by a Method of in-situ Observation) experiment which resulted in the first, headline-making images of space-grown (zero-G) ice crystals (snow flakes), the FE-2 installed a new pass-through plate ("C) on the SCOF (Solution Crystallization Observation Facility), stowing the previous plate ("B") in a bag for return to Earth.

Afterwards, Sandy performed routine maintenance on the CSA-CP (Compound Specific Analyzer-Combustion Products) units, first replacing the battery of the prime CSA-CP unit with a fresh spare (#1101), then zero-calibrating all units. *[The CSA-CP is a passive cabin atmosphere monitor that provides quick response capability during a combustion event (fire). Its collected data are stored on a logger. Following zero calibration, the backup units were stowed in the Node-1, along with the sampling pump, while the prime unit was deployed at the SM Central Post.]*

The FE-2 had another 2h 45m on her timeline for Part 2 of deploying & checking out the first Crew Quarter (CQ) rack in Node-2, at portside (NOD2P5), readying it for occupancy by Mike Fincke. *[Setting up the living quarters for use involved removing numerous launch locks and protective covers, installing interior sound-dampening blankets, electronics, power connections etc. Work progress was delayed yesterday when Sandy, upon removing the intake cover for the CQ fan, discovered the head of one of three fastener screws to be stripped. A procedure was uplinked overnight for the FE-2 to remove the rounded-out screw.]*

Somewhat belatedly, Magnus cleared out the CBCS (Centerline Berthing Camera System) from the Node-2 and stowed the equipment to protect it against possible damage. *[CBCS, which was used at the Node-2 nadir hatch to support MPLM "Leonardo" docking, was not stowed during ULF2 as originally planned.]*

Sandy also completed the routine daily servicing of the SM's SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV*

waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]

The daily IMS (Inventory Management System) maintenance was on Sandy's voluntary "job jar" task list for today, consisting of updating/editing of its standard "delta file" including stowage locations, for the regular weekly automated export/ import to its three databases on the ground (Houston, Moscow, Baikonur).

At 1:45pm, the FE-2 supported the periodic VHF-1 emergency communications check over NASA's VHF (Very High Frequency) stations, today with the Wallops VHF Site (1:48pm), talking with Houston/Capcom, MSFC/PAYCOM (Payload Operation & Integration Center Communicator), Moscow/GLAVNI (TsUP Capcom), EUROCOM/Munich and JCOM/Tsukuba in the normal fashion via VHF radio from a handheld microphone and any of the USOS ATUs (Audio Terminal Units). *[Purpose of the test is to verify signal reception and link integrity, improve crew proficiency, and ensure minimum required link margin during emergency (no TDRS) and special events (such as a Soyuz relocation).]*

Working from his discretionary "time permitting" job list, Yuri Lonchakov conducted the frequent status check on the Russian BIO-5 Rasteniya-1 ("Plants-1") experiment, verifying proper operation of the BU Control Unit and MIS-LADA Module fans (testing their air flow by hand). *[Rasteniya-1 researches growth and development of plants under spaceflight conditions in the LADA-14 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP).]*

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (FE-2, FE-1) and VELO bike with bungee cord load trainer (FE-1).

Both the CDR and the FE-2 had their next regular FFQ (Food Frequency Questionnaire) sessions on their discretionary "job jar" task lists, their fourth, filing the forms on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

At ~12:20pm, the ISS crew had their regular weekly tagup with the Lead Flight

Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC (Station Support Computer).]*

WRM Update: An updated WRM (Water Recovery Management) "cue card" was uplinked yesterday for the crew's reference, updated with the latest water audit. *[The new card (18-0006H) lists 39 CWCs (~1,250.9 L total) for the four types of water identified on board: technical water (673.8 L, for Elektron electrolysis), potable water (530.4 L, incl. 174.6 L currently off-limit because of Wautersia bacteria), condensate water (0.0 L), waste/EMU dump and other (46.7 L). Wautersia bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

SARJ Autotrack Test: To supplement data collected during ULF2, ground controllers last night successfully concluded a series of tests to gather data to characterize the performance of the Starboard Solar Alpha Rotary Joint during autotrack mode. EWIS (External Wireless Instrumentation System) and SDMS (Structural Dynamic Measurement System) data were collected, including at an angle sweep offset by 90 deg. The test took place over 5 orbits.

CEO (Crew Earth Observations) photo targets uplinked for today were **Beijing, China Aerosol** (weather was predicted to be clear over the Beijing metropolitan area, providing an opportunity to photograph aerosols over the city. Looking to the right of track as ISS passed over Bohai Bay [also known as the Bohai Sea] and the Yellow Sea. Stratification of pollution haze should have been visible in an Earth limb view over the metropolitan area; also of interest are images that capture the orientation and extent of a visible pollution plume), **North Mariana Islands, & Guam, Pacific Ocean** (ISS orbit track passed over the northern Marianas island chain. Overlapping, nadir viewing images of the northernmost islands and surrounding reefs were requested to track shoreline change and reef extent over time), **Southwest Algeria Megafans** (the crew had a nadir pass over the northwestern portion of these recently recognized inland deltas. This megafan complex was created by rivers that flowed west and northwest from the Adrar N'Ahnet Mountains in southwestern Algeria. Overlapping frames, taken along track, were requested to map channel positions and the extent of sedimentary deposits), and **Soufriere Hills Volcano, Montserrat** (the Soufriere Hills volcano comprises the southern half of the island of Montserrat in the Lesser Antilles chain. An active and highly dangerous volcano, eruptions beginning in 1995 caused the evacuation and destruction of the capitol city of Plymouth. Overlapping frames of the island were requested to capture both the morphology of the volcano and extent of visible eruptive products. Gas, steam, and ash plumes may also be visible).

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the

Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 8:54am EST [= epoch]):
Mean altitude -- 354.1 km
Apogee height -- 359.4 km
Perigee height -- 348.9 km
Period -- 91.62 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007777
Solar Beta Angle -- -60.7 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 18 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57770

Significant Events Ahead (all dates Eastern Time, some changes possible!):
12/22/08 -- Russian EVA-21 (wake 9:30am; hatch opening ~7:15pm; ingress 1:25am 12/23; sleep 7:10am);
02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/12/09 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
08/06/09 -- STS-128/Discovery/17A – MPLM (P), LMC, last crew rotation
08/XX/09 -- Soyuz 5R/MRM2 (Russian Mini Research Module, MIM2) on Soyuz
09/XX/09 -- H-IIB (JAXA HTV-1)
11/12/09 -- STS-129/Atlantis/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P), LMC
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4
12/XX/11-- Proton 3R/MLM w/ERA.

Note: The daily ISS On-Orbit Status reports can also be found at

http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/18/08
Date:	Thursday, December 18, 2008 12:27:33 PM
Attachments:	

ISS On-Orbit Status 12/18/08

All ISS systems continue to function nominally, except those noted previously or below. Sleep cycle shifting begins tonight for EVA-21 by moving bedtime 90 min to the left, i.e., from 4:30pm to 3:00pm. Wakeuop tonight: 11:30pm EST.

Yuri Lonchakov performed the periodic maintenance of the active Russian BMP (Harmful Impurities Removal System) by terminating the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system and starting it on bed #2. The process will be closed down at ~2:45pm EST. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted normally only during crew awake periods except for last night. The BMP's regeneration cycle is currently done every 20 days (last time done: 11/28-29).]*

Working in the DC1 Docking Compartment, CDR Fincke & FE-1 Lonchakov continued preparations for tomorrow's suited dry-run and the EVA-21 spacewalk on 12/22 (Monday), by –

- Performing pressure checks on the portable O_2 tanks (BK-3) and portable air repress bottles (BNP),
- Conducting BRTA (radio telemetry unit) checkouts for the Orlans & BSS interface units,
- Setting up Orlan BRTK "Korona" comm configuration, running voice checks and testing medical parameter acquisition of the BETA-08 ECG (electrocardiograph) harnesses with the "Gamma-1M" med complex from the PKO med exam panel for vital signs & equipment monitoring,
- Installing US EMU (Extravehicular Mobility Unit) lights and one wireless video camera (for Yuri) on the Orlan-M suits,
- Installing Orlan attached hardware (OTA) plus taking photos of the outfitted Orlans for downlink (OTA equipment includes: right-hand swing arm with tool caddy, small trash bag, SWG space launch project stop watch, promotional OMEGA watches, wire ties, tethers, camera, wrench and cutters),
- Preparing auxiliary NASA equipment to be used in Orlan plus taking photos of the outfitted Orlans for downlink,

- Mounting the Fresnel lens viewing aid in the helmets,
- Filling the DIDBs (disposable in-suit drink bags) and installing them in the suits,
- Unstowing EVA emergency first-aid medical packs and stowing them in the DC1, and
- Testing the proper function of the hatch pressure equalization valve (PEV; Russian: KVD) from the POV panels in the SM PkhO (Service Module Transfer Compartment) and DC1.

[The checkouts of the Orlan "Korona" communication links, which include VHF/ voice and biomedical electrode belt and telemetry hookups via the BSS (after egress to be switched to the wireless in-suit radio telemetry system Tranzit-B), showed a failed voice link in the current hard-wired onboard configuration. Troubleshooting by TsUP-Moscow and crew is underway.]

Additionally, the FE-1 worked on the second unit of the EXPOSE-R payload, securing its exposed bolts with Aramide tape for safety during egress and translation to its external installation site.

In the DC1, Yuri configured two connectors on the PPS-1 payload panel for the OBSTANOVKA (Environment) payload by covering them with protective caps. *[The GFI-11/OBSTANOVKA payload, along with the IMPULSE experiment, will be installed externally for using ionosphere probes and a pulsed plasma source to make scientific measurements of ionosphere parameters and plasma-wave characteristics.]*

The three crewmembers had 1h set aside for reviewing flight procedures and DC1 airlock operations for the spacewalk. *[Egress is currently scheduled for 7:15pm EST on 12/22, with ingress expected at ~1:25am on 12/23. EV1/Lonchakov will wear Orlan #26 with blue stripe, EV2/Fincke Orlan #27 with red stripe. During the EVA, all hatches in the USOS (US Segment) will remain open, and FE-2 Magnus will be able to move freely about the cabin, including the FGB. The toilet in the Soyuz, docked at the FGB nadir port, will be On. The SM PkhO hatches will be closed, separating the SM from the rest of the ISS in order to serve as a backup airlock to the DC1. SM systems will be powered down (Vozdukh, Elektron, SKV/air conditioner, ASU/toilet). In the USOS, CDRA (Carbon Dioxide Removal Assembly) will be on standby and TCCS (Trace Contaminant Control System) will be powered down. The Lab RWS (Robotics Workstation) will be On so that video from the WVS (Wireless Video System) and outboard cameras (P1LOOB/ P1 Lower Outboard, S1LOOB, P1LOIB/P1 Lower Inboard) can be piped in for Sandy's viewing.]*

Since the WHC (Waste & Hygiene Compartment), while being now fully functional,

is currently on hold pending installation of the privacy enclosure, CDR Fincke reconfigured the UPA (Urine Processor Assembly) for receiving urine from a Russian EDV-U container instead of the WHC (by disconnecting the WHC urine jumper and replacing it with an EDV transfer hose), then filled the WSTA with pretreated urine.

Sandra Magnus meanwhile conducted the T+2d inflight microbiology analyses for the samples collected on 12/16 from the PWD (Potable Water Dispenser) Ambient plus SVO-ZV and SRV-K Warm taps. *[Sandy reported "yellow" for Coliform (= Negative) and "purple colonies" in the MCD (Microbial Capture Device), i.e., about 85 tiny dots. Pictures were taken.]*

The FE-1 collected the periodic readings of potentially harmful atmospheric contaminants in the SM, using the CMS (Countermeasure System), a component of the SKDS GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, today using preprogrammed microchips to measure for o-Xylol (1,2-Dimethylbenzol, C_8H_{10}) and Methyl-Mercaptan (Methanethiol, CH_4S).

The FE-2 had 2.5 hrs on her timeline for Part 1 of deploying and checking out the first Crew Quarter (CQ) rack in Node-2, Port 5 (NOD2P5). *[For the initial rotation of the rack away from the wall, Mike Fincke provided assistance. Sandy then proceeded to make cable connections and to apply power. Telemetry states and verification of correct wiring connections were later to be made remotely by MCC-H controllers. Each of the two CQs, which arrived on ULF2, has a speaker installed which connects to the Node-2 ATUs (Audio Terminal Units) via the CQ patch panel. Preflight ground testing has uncovered major audio feedback issues when trying to transmit within ~4 ft of the CQ speaker which, however, can be used for C&W (Caution & Warning) alarm and S/G (Space-to-Ground) monitoring purposes until the problem is fixed.]*

Magnus performed maintenance on two HRDs (High Rate Dosimeters) by replacing their AAA batteries with fresh ones from the battery "pantry" (four AAAs per unit). *[Batteries are replaced in both units yearly to ensure the HRDs are ready to be used in a contingency situation.]*

The FE-2 also completed the weekly 10-min. CWC (Contingency Water Container) inventory as part of on-going WRM (Water Recovery & Management) assessment of onboard water supplies. Updated "cue cards" based on the crew's water calldowns are sent up every other week. *[The current card (18-0006G), to be updated, lists 39 CWCs (~1,272.9 L total) for the four types of water identified on board: technical water (695.8 L, for Elektron electrolysis), potable water (530.4 L, incl. 174.6 L currently off-limit because of* Wautersia *bacteria), condensate water*

(0.0 L), waste/EMU dump and other (46.7 L). Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), and RED resistive exercise device (FE-2).

Sandy completed the routine daily servicing of the SM's SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

At ~4:45am EST, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~7:07am, the CDR powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, & power supply) and conducted, at 7:12am, a ham radio session with Scuola Elementare Faleriense "Gianni Rodari", Porto S. Elpidio, Italy. *[The school "Gianni Rodari" is located in Porto Sant'Elpidio, a small town in Southern Italy. It is situated on the shore of the Adriatic Sea, 50 km away from Ancona and 30 km from the city of San Benedetto del Tronto. "Gianni Rodari" is a big primary school including a kindergarten. The school offers practical courses and projects such as the radio contact with the ISS. Another important and exciting project for the pupils is the construction and test of the "coherer", the primitive radio signal detector. It was invented by Temistocle Calzecchi Onesti, who demonstrated in experiments in 1884 through 1886 that iron filings contained in an insulating tube will conduct an electrical current under the action of an electromagnetic wave. This discovery was important for the later work of Sir Oliver Lodge, Edouard Branly and Guglielmo Marconi in the development of the radio. Onesti lived in Monterubbiano, a small village near the city of Porto Sant'Elpidio. Questions to Mike were uplinked beforehand. "How are you?"; "What's your name and how old are you?"; "How long are you already onboard the ISS on this mission?"; "What do you feel during takeoff?"; "Are you afraid of anything during your stay onboard the ISS?"; "When did you decide to become an astronaut?"; "Did you have good marks at school?"; "What do you see right now when you look through the window of your spaceship?"; "What exactly is a black hole?"; "Do you see any planet from the spaceship?"; "What does the spaceship*

inside look like?"]

KURS Testing: Tonight at ~10:14pm EST, TsUP-Moscow will conduct tests of the automated radio flight system KURS-P (on SM) and KURS-A (on Progress 31P) in loop, for one and two strings. Necessary pre-test activities include turning on SM KURS heaters, activating KURS antennas and frequency generator heaters, BITS2-12 onboard telemetry measurement system, US-22 matching unit and the CSB KURS Approach Test Program.

Conjunction Update: Last night's (11:46pm EST) conjunction with space debris (Object 29406, SL-12 rocket) did not require crew action (taking temporary refuge in the Soyuz spacecraft), although notification had been received too late for a DAM (Debris Avoidance Maneuver). Miss distance, determined ~4.1 hrs before TCA (Time of Closest Approach), was 18.8 km.

CEO (Crew Earth Observations) photo target uplinked for today was Mumbai, India Aerosol *(looking to the right of track for aerosol plumes associated with the Mumbai metropolitan area. Mumbai is India's largest city, and one of the world's largest megacities. Looking for stratification or color changes within the atmosphere over Mumbai - photography of these features are useful for analysis of urban atmospheric and pollution dynamics. Sulfur-rich industrial smog appears lighter and gray when seen on the limb, and black carbon from urban fires and diesel oil burning appear as more yellow, red and brown layers)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 8:39am EST [= epoch]):
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Eccentricity -- 0.0007727
Solar Beta Angle -- -65.1 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 155 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57754

Significant Events Ahead *(all dates Eastern Time, some changes possible!):*
12/19/08 -- Russian EVA-21 Suited Exercise (wake 11:30pm 12/18; sleep 3:00pm 12/19);

12/22/08 -- Russian EVA-21 (wake 9:30am; hatch opening ~7:15pm; ingress 1:25am 12/23; sleep 7:10am);
02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/12/09 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch

Six-person crew on ISS

08/06/09 -- STS-128/Discovery/17A – MPLM (P), LMC, last crew rotation
08/XX/09 -- Soyuz 5R/MRM2 (Russian Mini Research Module, MIM2) on Soyuz
09/XX/09 -- H-IIB (JAXA HTV-1)
11/12/09 -- STS-129/Atlantis/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P), LMC
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4
12/XX/11-- Proton 3R/MLM w/ERA.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/17/08
Date:	Wednesday, December 17, 2008 12:00:15 PM
Attachments:	

ISS On-Orbit Status 12/17/08

All ISS systems continue to function nominally, except those noted previously or below. *>>>Today 105 years ago, the Wright Brothers conducted the first controlled, powered & sustained heavier-than-air human flight (1903). The feat, at Kill Devil Hills, NC, by Orville, lasted 12 sec and covered 120 ft.<<<*

Use of the DC1 Docking Compartment as airlock for the upcoming EVA-21 on 12/22 requires it to be isolated from the Progress M-01M/31P cargo ship currently docked to its nadir port. To this end, FE-1 Lonchakov & CDR Fincke began their day with –

- Activating the Progress (i.e., SUBA/Onboard Equipment Control System & SOTR/Thermal Control System),
- Removing the air heater/fan unit & air duct from the passageway,
- Collapsing the duct and stowing it with the heater assembly in the Russian segment (RS),
- Removing the quick-release screw clamps which rigidize the docking joint (with RS thrusters inhibited during the clamp removal (3:00am-4:40am EST),
- Closing the DC1-SU and SU-31P hatches (~3:20am), and
- Performing the usual one-hour leak check on both hatches (ending at ~4:40am).

Other preparations in the DC1 by Lonchakov & Fincke for the suited dry-run on 12/19 (Friday) and the spacewalk on 12/22 (Monday) included –

- Configuring the STTS communications link to support their presence in "Pirs",
- Performing ORU (on-orbit replaceable unit) installations on the Orlans, such as primary BK-3 oxygen (O_2) tanks, batteries on BRTA radio telemetry units, LP-9 LiOH cans, moisture collectors & FOP feedwater filters, IK-0702 CO_2 measurement unit filter, tool caddy, trash bags and tethers);
- Installing an additional BNP portable repress O_2 tank assembly in the DC1 (in case the PkhO-SU pressure equalization valve fails to open),

- Resizing the Orlan-M spacesuits #26 & #27 according to an uplinked resize table (to be repeated as necessary during the dry-run and under reduced airlock pressure), and
- Preparing & gathering crew-preference US EVA tools and systems hardware.

In the US Airlock, FE-2 Magnus terminated the recharge of EMU battery #2037 in the BSA BC4 (Battery Stowage Assembly/Battery Charger 4) and stowed it for supporting the Russian Orlan-EVA.

Also in support of EVA-21, Sandy Magnus worked with Kapton tape, scissors and tape measure to jerry-rig an extension for the pull tab on the US REBA (Rechargeable EVA Battery Assembly) which allows activation of the battery once it is installed in the Orlan-M.

Afterwards, Sandy retrieved EHIP (EMU Helmet Interchangeable Portable) light batteries #1028 & #1029 plus REBA battery #1008 and set them up for recharge. The process will be terminated tonight before sleep time and the batteries stowed for EVA-21.

The FE-1 performed the periodic maintenance of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The process will be terminated tomorrow morning after crew sleep, followed by Bed #2 regeneration. (Last time done: 11/28-29). *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle is normally done every 20 days.]*

The FE-2 conducted major IFM (Inflight Maintenance) on the VOA (Volatile Organics Analyzer) by –

- Removing the assembly from the CHeCS (Crew Health Care Systems) rack at LAB1S4,
- Changing out VOA components (N_2 Dryer, O_2 Scrubber, VOA Hard Disk, GC (Gas Chromatograph) Cooling Fan, Recirculation & Air-in Sieve Packs),
- Re-installing the VOA in the rack, and
- Removing Inlet & Exhaust caps.

[With its RPC (Remote Power Controller) switch ON, the VOA will be activated fro the ground.]

For cooling, Sandy afterwards hooked up MTL (Moderate Temperature Loop) jumpers to the CHeCS rack at the UIP (Utility Interface Panel) and Z-panel.

Yuri Lonchakov conducted monthly maintenance on the deactivated Russian IK0501 GA (Gas Analyzer) of the SOGS Pressure Control & Atmospheric Monitoring System by replacing its CO_2 filter assembly (BF) with a new unit from FGB stowage (done last: 11/5), then reactivating the unit. The old filter was discarded.

The FE-1 performed more troubleshooting in the FGB to investigate an unexplained "smoke" indication light on the PSS status panel, today checking connectors behind panel 306 and associated instruments. *[A check behind panel 429 on 12/13 failed to clear the issue.]*

Sandy Magnus completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur). Afterwards, the FE-2 discussed IMS stowage ops with ground specialists in a 20-min. teleconference.

Mike Fincke continued the preparation for cold stowage in the MELFI (Minus Eighty Degree Laboratory Freezer for ISS) for future samples by completing the ninth ICEPAC insertion into the freezer after ULF-2, today retrieving another four -32 degC ICEPAC belts and placing them into Dewar 3, Tray A/Sections 3 & 4 and Tray B/Sections 1 & 4 for cooling down.

Afterwards, Mike conducted the periodic status check on the running payloads CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) and ENose (Electronic Nose), both located in the ER-2 (EXPRESS Rack 2). *[ENose monitors the station's interior for harmful chemicals such as ammonia, mercury, methanol and formaldehyde, running continuously and autonomously. It is the first instrument aboard ISS which can detect and quantify chemical leaks or spills as they happen. If successful, ENose might be used in future space missions as part of an automated system to monitor and control astronauts' in-space environments. The shoebox-sized ENose contains an array of 32 sensors that can identify and quantify several organic and inorganic chemicals, including organic solvents and marker chemicals that signal the start of electrical fires. The sensors are polymer films that change their electrical conductivity in response to different chemicals, where the pattern of the sensor array's response depends on the particular chemical types present in the air. The instrument can analyze volatile aerosols and vapors, help monitor cleanup of chemical spills or leaks, and enable more intensive chemical analysis by collecting raw data and streaming it to a computer at JPL's ENose laboratory. The instrument, weighing less than nine pounds and requiring only 20 watts of power, has a wide range of chemical sensitivity, from fractional parts per million to 10,000 parts per million. Its data-analysis software can identify and*

quantify the release of chemicals within 40 minutes of detection. While ENose will look for 10 chemical types in this six-month experiment, it can be "trained" to detect many others.]

The FE-2 completed the routine daily servicing of the SM's SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

Working from his discretionary "time permitting" job list, Yuri conducted the frequent status check on the Russian BIO-5 Rasteniya-1 ("Plants-1") experiment, verifying proper operation of the BU Control Unit and MIS-LADA Module fans (testing their air flow by hand). *[Rasteniya-1 researches growth and development of plants under spaceflight conditions in the LADA-14 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP).]*

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-2, FE-1) and VELO bike with bungee cord load trainer (FE-1).

At ~2:05pm EST, CDR Fincke held a 15-min. teleconference with Lee Archambault, CDR of the next Shuttle mission, STS-119/Endeavour-15A, in February '09.

ISS Reboost Test: Last night's reboost test maneuver using the Progress 31P mid-ring thrusters was nominal. The thruster firing (duration: 9m 28s) took place at 10:58:50 pm EST and resulted in a delta-V of 0.49 m/s/1.61 ft/s (expected: 0.5 m/s/1.64 ft/s) and a mean altitude increase of 0.84 km/0.45 nmi (expected: 0.9 km/0.5 nmi). Attitude control authority will be handed over to Russian MCS (Motion Control System) at 9:10pm and returned to US Momentum Management at 11:45pm. *[31P is docked to the DC1 nadir port, i.e., radially, and the burn was performed in LVLH +XVV attitude (local vertical-local horizontal/+X axis into the velocity vector, i.e., flying bow-forward), the first time for this type of translational maneuver. Purpose of this reboost was to test the Progress mid-ring (lateral) thrusters to support a DAM (Debris Avoidance Maneuver) when a Soyuz is docked to the SM aft port (17S is currently docked at the FGB nadir port). The test burn also started the phasing for the STS-119/15A and 32P launches.]*

Conjunction Advisory: A new conjunction with space debris (Object 29406, SL-12) is being tracked with high priority for its closest approach tonight at 11:46pm EST, with at a radial miss distance of ~0.171 km. Due to late notification, it is too late for

any decision on a DAM (Debris Avoidance Maneuver). More data will be received and evaluated in the next several hours. The conjunction had not been identified prior to the reboost test due to its extremely sparse tracking over the past few weeks.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 8:22am EST [= epoch]):
Mean altitude -- 354.3 km
Apogee height -- 359.4 km
Perigee height -- 349.2 km
Period -- 91.63 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007626
Solar Beta Angle -- -69.1 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.71
Mean altitude gain in the last 24 hours -- 840 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57738

Significant Events Ahead *(all dates Eastern Time, some changes possible!):*
12/19/08 -- Russian EVA-21 Suited Exercise (wake 11:30pm 12/18; sleep 3:00pm 12/19);
12/22/08 -- Russian EVA-21 (wake 9:30am; hatch opening ~7:15pm; sleep 7:10am 12/23);
02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/12/09 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
08/06/09 -- STS-128/Discovery/17A – MPLM (P), LMC, last crew rotation
08/XX/09 -- Soyuz 5R/MRM2 (Russian Mini Research Module, MIM2) on Soyuz

09/XX/09 -- H-IIB (JAXA HTV-1)
11/12/09 -- STS-129/Atlantis/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P), LMC
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4
12/XX/11-- Proton 3R/MLM w/ERA.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/16/08
Date:	Tuesday, December 16, 2008 2:08:10 PM
Attachments:	

ISS On-Orbit Status 12/16/08

All ISS systems continue to function nominally, except those noted previously or below.

Before morning inspection and breakfast, FE-1 Lonchakov terminated his fourth experiment session for the long-term Russian sleep study MBI-12/ SONOKARD, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

Servicing the new WRS (Water Recovery System), FE-2 Magnus –

- Collected the periodic samples from the PWD (Potable Water Dispenser) Ambient and the SVO-ZV tap and the SRV-K Warm tap,
- Analyzed in-flight samples with the TOCA (Total Organic Carbon Analyzer) via the TOCA water sampling hose, the WMK MCD (Water Microbiology Kit/ Microbial Capture Devices) for microbial traces, and the CDB (Coliform Detection Bag) for inflight coliform indications (Magenta for Positive, Yellow for Negative),
- Stowed away the usual SRV-K Warm & SVO-ZV tap archival samples to be returned on 15A for post-flight analysis on the ground, and, after the analyses,
- Performed data recording and, for conserving water, the usual water reclamation from the sample bags via an absorbing towel (to be dried by airing) and concluded the activities.

[The TOCA performed successfully. WRS sampling & checkouts are regularly

conducted for 90 days: every 4 days – WRS water hose (TOCA inflight analysis) & microbial bag sample (inflight bacterial visual enumeration plus archival for return on 15A), every 8 days – an archival water sample (return on 15A), and monthly – a TOCA bag sample from PWD (tested inflight). Coliform bacteria are the commonly-used bacterial indicator of sanitary quality of foods and water. They are defined as rod-shaped Gram-negative non-spore forming organisms that ferment Lactose with the production of acid and gas when incubated at 35-37 degC. Coliforms are abundant in the feces of warm-blooded animals, but can also be found in the aquatic environment, in soil and on vegetation. In most instances, coliforms themselves are not the cause of sickness, but they are easy to culture and their presence is used to indicate that other pathogenic organisms of fecal origin may be present.]

As part of the regular physical fitness check prior to Orlan spacewalks, it was Yuri Lonchakov's turn today for the Russian MO-5 MedOps protocol of cardiovascular assessment during graded physical load on the VELO cycle ergometer, his second, assisted by Mike Fincke as CMO (Crew Medical Officer). *[The assessment uses the Gamma-1 ECG equipment with biomed harness, skin electrodes and a blood pressure and rheoplethysmograph cuff wired to the cycle ergometer's instrumentation panels. Measurements were telemetered down via VHF to RGS (Russian Groundsite) during a comm window at 4:43am EST (DO4. For the graded-load exercise, the subject works the pedals after a prescribed program at load settings of 125, 150, and 175 watts for three minutes each. Data output involves a kinetocardiogram, rheoplethysmogram, rheoencephalogram and a temporal pulsogram.]*

Major focus for CDR Fincke & FE-1 Lonchakov today was on Orlan spacesuit activities in the DC1 "Pirs" Docking Compartment, to go on for the next several days, preparing spacewalk hardware for the EVA-21 on 12/22 and the prior simulation exercises on 12/19.
After configuring the DC1 communications system for their presence, Yuri & Mike –

- Configured & tested the EVA support panels (POV) in the SM PkhO (Service Module Transfer Compartment) *[to be used for leak checks and valve tests on the Orlan suits, BSS interface units & hatch KVDs (pressure equalization valves)],*
- Checked out the BSS interface unit in the PkhO,
- Tested the Orlan BSS plus cooling loops and their degassing (i.e., liquid/gas separation) both in the DC1 and in the SM PkhO,
- Set up BNP portable repress O_2 tank #3 in the SM RO (Working Compartment). and
- Activated & inspected their spacesuits *[Orlan #27 (red stripe) for EV1/ Lonchakov, #26 (blue stripe) for EV2/Fincke].*

Additionally, the FE-1 worked on the EXPOSE-R payload, securing its lid with Aramide tape to ensure it stays closed during egress and translation to its external installation site.

Yuri also took the periodic and pre-EVA sensor readings of the Russian “Pille-MKS” (MKS = ISS) radiation dosimetry experiment which has ten sensors placed at various locations in the Russian segment (DC1, SM starboard & port cabin windows, ASU toilet facility, control panel, etc.). The Pille Reader was left powered up. *[Nine of the ten dosimeters are read manually.]*

Later, Lonchakov & Fincke installed the StM Docking Mechanism between Progress M-01M/31P and the DC1 airlock. *[StM is the "classic" probe-and-cone type, consisting of an active docking assembly (ASA) with a probe (SSh), which fits into the cone (SK) on the passive docking assembly (PSA) for initial soft dock and subsequent retraction to hard dock. The ASA is mounted on the Progress' cargo module (GrO), while the PSA sits on the docking ports of the SM, FGB and DC1.]*

Sandra Magnus finished transferring and unpacking US cargo items delivered on 31P.

In the U.S. Airlock, Magnus terminated the discharge on EMU (Extravehicular Mobility Unit) battery #2074 and initiated it on battery #2037 in the BSA BC4 (Battery Stowage Assembly/Battery Charger 4). *[The periodic maintenance consists of fully discharging (and later recharging) the storage units to prolong their useful life. After end of the maintenance cycle, Sandy restored the SSC laptop, which is used in DOS mode for the automated procedure, to nominal ops.]*

The FE-2 also continued the preparation of the MELFI (Minus Eighty Degree Laboratory Freezer for ISS) for future sample storing by completing the eighth ICEPAC insertion into the freezer after ULF-2, today retrieving another two -32 degC ICEPAC belts and placing them into Dewar 2, Tray C/Section 1 & Tray D/ Section 4 for cooling down.

CDR Fincke used the electronic Velocicalc instrument to take the periodic THC IMV (Temperature & Humidity Control/Intermodule Ventilation) air flow measurements of relative humidity (dew point, wet bulb temp), temperature and air velocity (flow rate) between modules. *[There is no direct measurement of airflow except as reflected by, and calculated (with Velocicalc) from, differences in atmosphere partial pressures measured at selected points between the RS and USOS. $ppCO_2$ is a good yardstick since for example an increasing $ppCO_2$ in the Lab not reflected in the SM would indicate that Vozdukh is not receiving the air from the Lab at an*

efficient rate. Periodic air flow degradation checks support establishing a most effective fan cleaning schedule.]

In preparation for tonight's reboost test, Sandy Magnus tightened an AVM (Anti Vibration Mount) bracket bolt on the ESA FSL FCE (Fluid Science Laboratory/ Facility Core Element) in the COL (Columbus Orbital Laboratory). *[The lower right AVM bracket of the FCE has only one bolt working. To protect the AVM against reboost loads, the torque on the bolt had to be increased (to 22 inch-lb) and the other (loose) bolt secured with Kapton tape.]*

Sandy also completed the routine daily servicing of the SM's SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

For tonight's thruster maneuver, the FE-2 also closed the protective shutters of the Lab & JPM (JEM Pressurized Module) science windows.

EWIS (External Wireless Instrumentation System) and IWIS (Internal Wireless Instrumentation System) were to be activated by ground commanding for capturing structural dynamics data of the station during the reboost firing.

The crew had their periodic PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Yuri at ~8:55am, Sandy at ~10:05am, and Mike at ~12:00pm EST.

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1/MO-5).

ISS Reboost Test: Tonight the station will perform a test maneuver using the Progress 31P mid-ring thrusters. The thruster firing (duration: 9m 28s) is scheduled at 10:58:50 pm EST. Expected delta-V: 0.5 m/s (1.64 ft/s), with a mean altitude increase of ~0.9 km (0.5 nmi). Attitude control authority will be handed over to Russian MCS (Motion Control System) at 9:10pm and returned to US Momentum Management at 11:45pm. *[31P is docked to the DC1 nadir port, i.e., radially, and the burn will be done in LVLH +XVV attitude (local vertical-local horizontal/+X axis into the velocity vector, i.e., flying bow-forward), the first time for this type of translational maneuver. The purpose of this reboost is to test the Progress mid-ring (lateral) thrusters to support a DAM (Debris Avoidance Maneuver) when a Soyuz is docked to the SM aft port (17S is currently docked at the FGB nadir port). The test*

burn will also start the phasing for the STS-119/15A and 32P launches.]

CEO (Crew Earth Observations) photo targets uplinked for today were **Teide Volcano, Canary Is.** *(at 3,718m above sea level and about 7,500m above the ocean floor, this is the highest point on both Spain and the Atlantic Ocean. ISS pass was in late afternoon with partly cloudy conditions expected [low clouds swirling around the islands]. Looking well right of track [SW] for Tenerife Island with sun glint further to the SW. Using the long lens settings for detail).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 7:43am EST [= epoch]):
Mean altitude -- 353.5 km
Apogee height -- 358.1 km
Perigee height -- 348.9 km
Period -- 91.61 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006856
Solar Beta Angle -- -72.3 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 33 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57722

Significant Events Ahead *(all dates Eastern Time, some changes possible!):*
12/16/08 -- ISS reboost test (~10:58pm; 0.5 m/s)
12/19/08 -- Russian EVA-21 Suited Exercise (wake 11:30pm 12/18; sleep 3:00pm 12/19);
12/22/08 -- Russian EVA-21 (wake 9:30am; hatch opening ~7:15pm; sleep 7:10am 12/23);
02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/12/09 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)

05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch

Six-person crew on ISS

08/06/09 -- STS-128/Discovery/17A – MPLM (P), LMC, last crew rotation
08/XX/09 -- Soyuz 5R/MRM2 (Russian Mini Research Module, MIM2) on Soyuz
09/XX/09 -- H-IIB (JAXA HTV-1)
11/12/09 -- STS-129/Atlantis/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P), LMC
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4
12/XX/11-- Proton 3R/MLM w/ERA.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/15/08
Date:	Monday, December 15, 2008 2:19:44 PM
Attachments:	

ISS On-Orbit Status 12/15/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 8 of Increment 18.*

FE-2 Magnus' first activity this morning was to start on Day 2 of her FD30 (Flight Day 30) session with the NASA/JSC experiment NUTRITION w/Repository, finishing the 24 hrs urine collection period with first void this morning. *[The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by supercold MELFI dewars), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

CDR Fincke, FE-1 Lonchakov and the FE-2 began their workday before breakfast with the periodic session of the Russian biomedical routine assessment PZEh-MO-7/Calf Volume Measurement. *[Calf measurements (left leg only) are taken with the IZOG device, a custom-sewn fabric cuff that fits over the calf, using the knee and lower foot as fixed reference pints, to provide a rough index of deconditioning in zero-G and effectiveness of countermeasures.]*

As part of the regular physical fitness check prior to an Orlan spacewalk, Mike Fincke undertook the Russian MO-5 MedOps protocol of cardiovascular assessment during graded physical load on the VELO cycle ergometer, his first, assisted by Yuri Lonchakov as CMO (Crew Medical Officer). *[The assessment uses the Gamma-1 ECG equipment with biomed harness, skin electrodes and a blood pressure and rheoplethysmograph cuff wired to the cycle ergometer's instrumentation panels. Measurements were telemetered down via VHF to RGS (Russian Groundsite) during a comm window at 4:16am EST (DO4. For the graded-load exercise, the subject works the pedals after a prescribed program at load*

settings of 125, 150, and 175 watts for three minutes each. Data output involves a kinetocardiogram, rheoplethysmogram, rheoencephalogram and a temporal pulsogram.]

In the SM (Service Module), Lonchakov repeated a software upgrade of the Russian BSMM (Multi-Channel Matching Unit) payload computer which had failed on 12/10. The new software (vers. 3.0) was loaded from a CD-ROM on the RSS1 laptop. After the program installation, communications between the BSMM computer and the RSS1 laptop were checked with the RSC-Energia PingMaster application. *[BSMM is part of the OpsLAN (Operations Local Area Network), which also includes such items as the BSPN (Payload Server), OBC (Onboard Controller) for RokvISS, and GTS (Global Timing System). During the 12/10 attempt, new files were not copied from the CD disk.]*

Fincke meanwhile continued the preparation of the MELFI (Minus Eighty Degree Laboratory Freezer for ISS) for future sample storing by completing the seventh ICEPAC insertion into the freezer after ULF-2, today retrieving another two -32 degC ICEPAC belts and placing them into Dewar 2, Tray B/Section 1 & Tray D/ Section 1 for cooling down.

For tomorrow night's planned ISS reboost (~11:00pm EST), the CDR powered up the IWIS (Internal Wireless Integrated System) with its RSU (Remote Sensor Unit) accelerometers in the Lab, Node-1 & Node-2 plus the NCU (Network Control Unit). *[SM & FGB RSUs not required. IWIS will gather structural dynamics data during the thruster firing, to be downlinked later via OCA.]*

After setting up comm connections for their extended work in the DC1 (Docking Compartment), Mike & Yuri continued their preparations for the ORLAN-suited dry run later this week (12/19) and the EVA-21 next week (12/22). *[The crewmembers tagged up with ground specialists on VHF, terminated the charging process on the second 825M3 battery pack, consolidated & bundled equipment for carrying outside, took documentary photography & video, and downlinked the imagery to the ground for specialist review.]*

In the U.S. Airlock (A/L), Magnus initiated maintenance discharge on one of two EMU (Extravehicular Mobility Unit) batteries (#2075); later, she ran the process also on the second (#2074). *[The periodic maintenance consists of fully discharging (and later recharging) the storage units to prolong their useful life. After end of the maintenance cycle, Sandy restored the SSC laptop, which is used in DOS mode for the automated procedure, to nominal ops.]*

Fincke supported POIC (Payload Operation & Integration Center)/Huntsville in powering up the MSG (Microgravity Science Glovebox) Rack, then prepared its

SHERE (Shear History Extension Rheology Experiment) payload for new experimentation. *[Mike activated the experiment hardware, conducted a checkout and loaded the SHERE payload with new software from the A31p MLC (MSG Laptop Computer). Afterwards, the MSG was configured for Standby and the laptop powered down.]*

Sandy Magnus had 2 hrs set aside to work in the Kibo JPM (JEM Pressurized Module) on troubleshooting the CO_2 CGSE (Common Gas Supply Equipment) by installing a position holder in the CO_2 valve unit to keep the SSV (Self Shut-off Valve) opened permanently. *[On 8/8, the CBEF (Cell Biology Experiment Facility) in the SAIBO Rack experienced a sudden unexpected pressure drop at the CGSE CO_2 high-pressure sensor, from 3000 kPa to 500 kPa within 1.5 minutes, followed by a very gradual pressure decrease. Specialists believe that the SSV closed itself unexpectedly, thus contributing to the sudden pressure decrease. Also suspected was leakage from the CO_2 supply line, but no leak was found on the systems side. Later, SSIPC (Space Station Integration & Promotion Center)/Tsukuba concluded that the CO_2 leak location for the observed gradual pressure decrease was the MVV (Manual Vent Valve) of the SAIBO Rack. The crew closed the MVV, and no leak was observed afterward. The fix by Magnus today keeps the SSV fully open so that it will not unexpectedly close again (this does not affect safety since even if CO_2 should be released into the cabin upon failure of the pressure regulator, its partial pressure will never go to the limit.]*

In the RS (Russian Segment), Lonchakov used CWC (Contingency Water Container) #1030 for the periodic (about twice a month) replenishing of the Elektron oxygen generator's water supply for electrolysis, filling the KOV thermal loops' EDV container. Once filled, the EDV was connected to the BPK transfer pump for processing. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron shutdown.]*

The FE-2 performed troubleshooting on the flush water inlet of the WHC (Waste & Hygiene Compartment), then worked on WHC systems activation & checkout. *[Wearing protective gloves, goggles and dust mask, Sandy was to remove a panel, inspect valve components & jumper connectors on the WHC and UPA (Urine Processor Assembly), reclose the panel and proceed with initial activation procedures.]*

Yuri completed the routine daily servicing of the SM's SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO*

& KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]

As part of the SOZh servicing, the FE-1 conducted the periodic checkout/verification of IP-1 airflow sensors in the various RS hatchways. *[They include the "thoroughfares" SM PrK (Transfer Compartment)–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, and FGB GA–Node-1.]*

Lonchakov also completed the periodic data collection on the long-term BIO-5 Rasteniya-1 ("Plants-1") experiment, copying data from its built-in control computer to a PCMCIA memory card for subsequent downlink to the ground via OCA. The regular periodic equipment status check was listed for today on the Russian discretionary "as time permits" task list. *[Rasteniya-1 researches growth and development of plants under spaceflight conditions in the LADA-14 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). The payload hardware includes a module (MIS/Module for the Investigation of Substrates), the MIS control unit (BU), a nitrogen purge unit (BPA) and other accessories. During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. LADA consists of a wall-mounted growth chamber that provides long-term, ready access for crewmember interaction. It provides light and root zone control but relies on the cabin environmental control systems for humidity, gas composition, and temperature control. Cabin air is pulled into the leaf chamber, flows over the plants and vents through the light bank to provide both plant gas exchange and light bank cooling.]*

The FE-2 performed the monthly maintenance on the CEVIS (Cycle Ergometer with Vibration Isolation), particularly with an eye on the 6-inch isolator units which Greg Chamitoff had installed on 9/25. Magnus reported that isolator cables all look normal.

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

At ~4:20pm, just before sleep time, Yuri will set up the Russian MBI-12 SONOKARD (Sonocard) payload and start his fourth experiment session, using a sports shirt from the SONOKARD kit with a special device in the pocket for testing a new method for acquiring physiological data without using direct contact on the skin. Measurements are recorded on a data card for return to Earth.

[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]

At ~11:30am EST, Sandy Magnus conducted a 20-min. S/band/Ku-band audio/ video teleconference with her successor, JAXA Astronaut Koichi Wakata, who will replace Magnus during the STS-119-15A docked period in February 2009. *[While Sandy will return to Earth with 15A on 2/26, Koichi will remain as ISS FE-2 until STS-127-2J/A end of May 2009.]*

At ~11:25am, the FE-2 powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, & power supply) and conducted, at 11:50am, a ham radio session with King George Elementary School, Moose Jaw, Saskatchewan/Canada. *[King George School is a Kindergarten-to-Grade-Eight school of 370 students. The study of space has been an integral part of the King George Science program for years. It is a topic that captures the hearts and imaginations of staff and students alike. Class activities would include researching Canada's participation in the space program, developing a model for an Earth-orbiting space station and comparing the training for such roles as a payload specialist, a researcher, an engineer, or a navigator Questions to Sandy were uplinked beforehand. "What is the most visible man made structure seen from space?"; "If you could bring only one luxury to space with you, what would it be and why?"; "In your opinion, what is the hardest task to complete on the International Space Station?"; "Has any astronaut become ill on the ISS?"; "How long will you be in space, and what is the longest a person has been in space?"; "How frustrating does it get not being able to do things as easily as you can do them on Earth?"; "When you go outside to work on the space station or do other experiments, how does it make you feel?"; "How much training does it take to be an astronaut?"; "Have you ever waken up in the middle of the night and thought "Where am I?""; "What is it like not being with your family for long periods of time?"]*

ISS Reboost Preview: Tomorrow's ISS reboost by Progress 31P is scheduled for a TIG (Time of Ignition) of about 10:58pm EST for ~6 min, to yield an expected delta-V of 0.5 m/s. Attitude control authority will be handed over to the Russian MCS (Motion Control System) at 9:00pm and returned to US Momentum Management at 11:20pm.

No CEO (Crew Earth Observations) photo target uplinked for today due to lighting conditions in the northern hemisphere that place targets outside the CEO team's

criteria for illumination and visibility. Normal targets are expected to return on 12/18.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 8:46am EST [= epoch]):
Mean altitude -- 353.5 km
Apogee height -- 358.1 km
Perigee height -- 348.9 km
Period -- 91.61 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006823
Solar Beta Angle -- -74.4 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 35 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57707

Significant Events Ahead *(all dates Eastern Time, some changes possible!):*
12/16/08 -- ISS reboost (~10:58pm; 0.5 m/s)
12/19/08 -- Russian EVA-21 Suited Exercise (wake 11:30pm 12/18; sleep 3:00pm 12/19);
12/22/08 -- Russian EVA-21 (wake 9:30am; hatch opening ~7:15pm; sleep 7:10am 12/23);
02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/12/09 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
08/06/09 -- STS-128/Discovery/17A – MPLM (P), LMC, last crew rotation
08/XX/09 -- Soyuz 5R/MRM2 (Russian Mini Research Module, MIM2) on Soyuz
09/XX/09 -- H-IIB (JAXA HTV-1)
11/12/09 -- STS-129/Atlantis/ULF3 - ELC1, ELC2

12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P), LMC
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4
12/XX/11-- Proton 3R/MLM w/ERA.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/14/08
Date:	Sunday, December 14, 2008 1:43:03 PM
Attachments:	

ISS On-Orbit Status 12/14/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – off-duty day for CDR Fincke, FE-1 Lonchakov & FE-2 Magnus. Ahead: Week 8 of Increment 18.*

CDR Fincke's first activity this morning was to start on the second day of his FD60 (Flight Day 60) session with the NASA/JSC experiment NUTRITION w/Repository. This was an all-day session, the third for Mike, of collecting urine samples several times for 24 hrs, to continue through first void tomorrow morning. *[The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by supercold MELFI dewars), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

For FE-2 Magnus, it was the first day of her second (FD30) NUTRITION w/ Repository session of collecting blood and urine samples, after last night's start of her 8-hr fast for today's blood sampling. *[After performing phlebotomy with the help of CDR Fincke, i.e., drawing blood samples (from an arm vein), Sandra's samples were first allowed to coagulate in the Repository for 20-30 minutes, then spun in the HRF RC (Human Research Facility/Refrigerated Centrifuge) and finally placed in MELFI (Minus-Eighty Laboratory Freezer for ISS). No thruster activity was allowed during the blood drawing. The RC was later powered off after a temperature reset to limit wear on the compressor, and cleaned.]*

FE-1 Lonchakov performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. Additionally, the FE-1 today

checked up on the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem, gathering weekly data on total operating time & "On" durations for reporting to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

In preparation for the Orlan dry-run on 12/19 and the EVA-21 on 12/22, Lonchakov terminated the charging on the first Orlan 825M3 battery pack started yesterday in the DC1 (Docking Compartment) and initiated the process on the second pack.

CDR Fincke serviced the US WRS (Water Recovery System) by refilling the WSTA (Water Storage Tank Assembly) with pretreated urine from EDV-U container for processing by the UPA (Urine Processing Assembly). *[The WSTA should be filled to no more than 60%. Recycled water from the PWD may now be used by the crew for non-oral hygiene purposes.]*

Mike Fincke also completed the visual "T+2 Day" microbial (bacterial & fungal) analysis of the potable water samples collected by Sandy on 12/12 from the WRS (Water Recovery System) and processed on board with the MCDs (Microbial Capture Devices) and CDBs (Coliform Detection Bags). *[WRS samplings are regularly conducted for 90 days, specifically every 4 days: WRS water hose (TOCA inflight analysis) & microbial bag sample (inflight bacterial visual enumeration plus archival for return on 15A), every 8 days: an archival water sample (return on 15A), and monthly: a TOCA bag sample from the PWD (Potable Water Dispenser, tested inflight). Coliform bacteria are the commonly-used bacterial indicator of sanitary quality of foods and water. They are defined as rod-shaped Gram-negative non-spore forming organisms that ferment Lactose with the production of acid and gas when incubated at 35-37 degC. Coliforms are abundant in the feces of warm-blooded animals, but can also be found in the aquatic environment, in soil and on vegetation. In most instances, coliforms themselves are not the cause of sickness, but they are easy to culture and their presence is used to indicate that other pathogenic organisms of fecal origin may be present.]*

In JAXA's Kibo JPM (JEM Pressurized Module), Mike supported SSIPC (Space Station Integration & Promotion Center)/Tsukuba activities by activating the MMA (Microgravity Measurement Apparatus) and its laptop (MLT), first powering up the MMA's NCU/RSU (Network Control Unit/Remote Sensor Unit) set from the Ryutai rack's UDC (Utility DC-to-DC Converter), then turning on both NCU/RSU and MLT. *[All payload activities except UDS/MMA on/off can be performed remotely by the ground.]*

For Yuri Lonchakov, it was time again for recharging the Motorola Iridium-9505A satellite phone brought up on Soyuz 17S, a monthly routine job and his third time. *[After retrieving it from its location in the TMA-13/17S Descent Module (BO), Yuri initiated the recharge of its lithium-ion battery, monitoring the process every 10-15 minutes as it took place. Upon completion at ~10:15am EST, the phone was returned inside its SSSP Iridium kit and stowed back in the BO's operational data files (ODF) container. The satphone accompanies returning ISS crews on Soyuz reentry & landing for contingency communications with SAR (Search-and-Rescue) personnel after touchdown (e.g., after an "undershoot" ballistic reentry, as happened during the recent 15S return). The Russian-developed procedure for the monthly recharging has been approved jointly by safety officials. During the procedure, the phone is left in its fire-protective fluoroplastic bag with open flap. The Iridium 9505A satphone uses the Iridium constellation of low-Earth orbit satellites to relay the landed Soyuz capsule's GPS (Global Positioning System) coordinates to helicopter-borne recovery crews. The older Iridium-9505 phones were first put onboard Soyuz in August 2003. The newer 9505A phone, currently in use, delivers 30 hours of standby time and three hours of talk, up from 20 and two hours, respectively, on the older units.]*

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

The crewmembers had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Yuri at ~6:20am, Sandy at ~1:10pm, Mike at ~3:35pm EST.

Working off the Russian discretionary "if time permits" task list, Lonchakov performed a session of the DZZ-2 "Diatomeya" ocean observations program, using the NIKON-F5 DCS still camera and the HDV (high-definition) video camcorder from SM window 8 for two periods of ~20 min each for recording bio-luminescent glow of high production zones in the Indian and Pacific Oceans. According to the available data, the glow can be observed as light spots having a weak greenish tint. *[Target zones in the Indian and Pacific Oceans were from the west of Australia to the east of New Zealand, and from south of the Madagascar Island to the north of New Zealand.]*

Also off the work suggestions list, Yuri conducted another session for Russia's Environmental Safety Agency (EKON), making observations and taking KPT-3 aerial photography of environmental conditions on earth using the Nikon D2X with the SIGMA 300-800mm telephoto lens.

As a third item on the discretionary job list, the FE-1 conducted the frequent status check on the Russian BIO-5 Rasteniya-1 ("Plants-1") experiment, verifying proper operation of the BU Control Unit and MIS-LADA Module fans (testing their air flow by hand). *[Rasteniya-1 researches growth and development of plants under spaceflight conditions in the LADA-14 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). The payload hardware includes a module (MIS/ Module for the Investigation of Substrates), the MIS control unit (BU), a nitrogen purge unit (BPA) and other accessories. During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. LADA consists of a wall-mounted growth chamber that provides long-term, ready access for crewmember interaction. It provides light and root zone control but relies on the cabin environmental control systems for humidity, gas composition, and temperature control. Cabin air is pulled into the leaf chamber, flows over the plants and vents through the light bank to provide both plant gas exchange and light bank cooling.]*

No CEO (Crew Earth Observations) photo target uplinked for today due to lighting conditions in the northern hemisphere that place targets outside the CEO team's criteria for illumination and visibility. Normal targets are expected to return on 12/18.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 8:25am EST [= epoch]):
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Perigee height -- 349.0 km
Period -- 91.61 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006785
Solar Beta Angle -- -74.8 deg (magnitude **peaking**)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 36 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57691.

Significant Events Ahead *(all dates Eastern Time, some changes possible!):*
12/19/08 -- Russian EVA-21 Suited Exercise (wake 11:30pm 12/18; sleep 3:00pm 12/19);
12/22/08 -- Russian EVA-21 (wake 9:30am; hatch opening ~7:15pm; sleep 7:10am 12/23);

02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
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02/26/09 -- STS-119/Endeavour/15A landing (nominal)
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04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/12/09 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch

Six-person crew on ISS

08/06/09 -- STS-128/Discovery/17A – MPLM (P), LMC, last crew rotation
08/XX/09 -- Soyuz 5R/MRM2 (Russian Mini Research Module, MIM2) on Soyuz
09/XX/09 -- H-IIB (JAXA HTV-1)
11/12/09 -- STS-129/Atlantis/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P), LMC
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4
12/XX/11-- Proton 3R/MLM w/ERA.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/13/08
Date:	Saturday, December 13, 2008 1:26:21 PM
Attachments:	

ISS On-Orbit Status 12/13/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – half-duty day for CDR Fincke, FE-1 Lonchakov & FE-2 Magnus. >>>Yesterday (12/12) Russia's RSC (Rocket & Space Corporation)-Energia, named after S.P. Korolev, celebrated its 90th Anniversary. Congratulations, partners!<<< For another momentous event,* ***see the item on Regen-ECLSS below****.*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the SM (Service Module) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

As part of the house cleaning, Yuri Lonchakov conducted regular maintenance inspection & cleaning of fan screens in the FGB (TsV2), DC-1 (V3) and SM (VPkhO, VPrK, FS5, FS6 & FS9). *[The activity included an audit of a bag (#363-17) for dust filter cartridges with vertical corrugation. If found, Yuri was to replace the SM & DC1 dust filters with them rather than cleaning the former.]*

Later, when performing the routine daily servicing of the SOZh system (ECLSS/ Environment Control & Life Support System) in the SM, Yuri also temporarily powered down the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem for the periodic cleaning of its pre-filter, using the vacuum cleaner with narrow-slit nozzle attachment. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

CDR Fincke's first activity this morning was to start on his FD60 (Flight Day 60) session with the NASA/JSC experiment NUTRITION w/Repository. This is an all-day session, the third for Mike, of collecting a blood sample plus urine samples several times for 24 hrs, to continue through first void tomorrow morning. *[After performing phlebotomy with the help of FE-2 Magnus, i.e., drawing blood samples (from an arm vein), the samples were first allowed to coagulate in the Repository for 20-30 minutes, then spun in the HRF RC (Human Research Facility/Refrigerated Centrifuge) and finally placed in MELFI (Minus-Eighty Laboratory Freezer for ISS). No thruster activity was allowed during the blood drawing. The RC was later powered off after a temperature reset to limit wear on the compressor, and cleaned. The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by supercold MELFI dewars), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

Sandra Magnus will start her FD30 NUTRITION session tomorrow, with her 8-hr fast beginning tonight (~7:40pm EST).

For her VolSci (Voluntary Weekend Science) Program today, FE-2 Magnus performed Part 2 of a major clean-up job of the JAXA "Marangoni" experiment in the Kibo JPM (Japanese Pressurized Module), estimated at ~3.5 hrs. The task required the MWA (Maintenance Work Area) and a downlink from the JPM internal camera to SSIPC (Space Station Integrated Promotion Center) in Tsukuba for ground support of the crew activity. Afterwards, the FPEF (Fluid Physics Experiment Facility) hardware was stowed. Part 1 of the clean-up was completed on 12/6. *[Work objective was to clean up spilled silicone oil inside the Marangoni Experiment Cell (MS) to prevent the Core from being further contaminated and to protect the hardware for the next Marangoni Experiment #2 on Increment 19. Part 1 involved removing the MS from the FPEF and disassembling the Experiment Core from the MS. Today's Part 2 was the actual silicone oil clean-up in the Core.]*

For his VolSci part, Mike Fincke started the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment for himself & the FE-2 by downloading older Actiwatch data from the Reader, then initializing the Actiwatches and decabling & stowing the Reader. Mike & Sandy then donned the Actiwatches. *[To monitor the crewmember's sleep/wake patterns and light exposure, the two crewmembers will be wearing the special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity*

throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]

The CDR also worked on the new FCF CIR (Fluids & Combustions Facility/ Combustion Integrated Rack), on which he had started outfitting on 12/6. *[Today Mike disconnected the CIR accumulator, removed the FCF upper & lower door launch locks, adjusted the EEU (Experiment Exchange Unit) airflow bypass, set the facility's valve timers and installed an absorber cartridge. The FCF Rack upper & lower doors were then closed for MDCA (Multi-user Droplet Combustion Apparatus) outfitting. Background: The MDCA is a multi-user facility designed to accommodate different droplet combustion science experiments, using the CIR of the NASA Glenn Research Center's FCF. The MDCA, in conjunction with the CIR, will allow for cost effective extended access to the microgravity environment, not possible on previous space flights. The MDCA contains the hardware and software required to conduct unique droplet combustion experiments in space. It consists of a CIA (Chamber Insert Assembly), an Avionics Package, and a multiple array of diagnostics.]*

For his daily work on the new WRS (Water Recovery System), Mike Fincke filled the UPA WSTA (Urine Processor Assembly/Water Storage Tank Assembly) from a Russian EDV-U container with pre-treated urine. *[Today is a momentous day:* ***For the first time, pre-treated urine has been processed into distillate by the UPA and then that distillate has been sent to the WPA (Water Processor Assembly), where it is being processed into the water that the OGS (Oxygen Generator System) is currently using to make the oxygen in the air the crew is breathing! All of the regenerative ECLSS racks are finally working together.*** *Thanks to the crew's hard work, the hard work of their shuttle crewmates, and the years of hard work of all those on the ground we now have a closed system on board!]*

The FE-1 performed troubleshooting in the FGB to investigate an unexplained "smoke" indication light on the PSS status panel, checking connectors behind panel 429 and associated instruments.

In the DC1 (Docking Module), Lonchakov set up and initiated charging on an Orlan 825M3 battery pack, preparatory to the Orlan spacesuit activations and checkout for the EVA-21 dry-run next week (12/19).

At ~10:30am EST, the crewmembers conducted their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-Houston and TsUP-Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any

concerns about future on-orbit events.

Working from his discretionary “as time permits” task list, Yuri conducted another ECON KPT-3 test session, making observations and taking aerial photography for Russia's Environmental Safety Agency (ECON) using the D2X with SIGMA 300-800mm telephoto lens.

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

At ~8:15am EST, the crew supported a formal live PAO TV downlink with greetings and congratulations to a special Russian educational event at the S.P. Korolev Russian National Children & Youth Center for Aerospace Education, scheduled for January 21-23, 2009, under the Memorial Museum of Cosmonautics in Moscow (the “Tsiolkovsky Monument”), for the Third Russian Youth Science Readings in honor of Sergey Pavlovich Korolev *[with the participation of 250 high-school and university students from 24 Russian regions, Belorussia and Kazakhstan. “…The new year, just like the year past, is rich with space milestones. The most notable are the half-century anniversaries of the first successful launches to the Moon with Luna-1, Luna-2 (Mechta/Dream) and Luna-3 …”]*

At ~10:55am, Yuri had a telephone interview with the editor of the Russian Cosmos Magazine. *[Prepared questions: “Please tell us what you’ve able to accomplish by this time”; “Tell us about our EVA preparation and what you are going to do”; “About your crewmates: what kind of climate you have at the station, what you are doing in your spare time”; “Have you been able to see and photograph something that you had discussed with MIIGAIK (Moscow Engineering Institute for Geodesics, Aerial Survey, and Mapping) and Victor Savinykh?”]*

Weekly Science Update *(Expedition Eighteen -- Week 7*

3-D SPACE: Complete.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Complete.

BCAT-3/4 (Binary Colloidal Alloy Test 3/4): Planned/Reserve.

BIO-4: Complete.

BIOLAB: “Thanks for retrieving hardware items from Progress and reconfiguring the BIOLAB sub-systems to continue the troubleshooting and prepare for WAICO

Run#2."

CARDIOCOG-2: Complete.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): In progress.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-3/CGBA-5 (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus 5): Ongoing.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

EDR (European Drawer Rack): Planned.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): Science acquisition for DEBIE-2, DOSTEL, EXPOSE, FIPEX, MEDET. On-ground troubleshooting for TRIBOLAB.

FSL (Fluid Science Laboratory): FSL is nominal.

GEOFLOW: "Sandy, thanks for unlocking the Facility Core Element (FCE) to enable the re-start of the GEOFLOW science acquisition. Run#5 was successfully performed on 12/11. Subsequent runs will be ground commanded in the next couple of days."

HDTV System Test DL (JAXA): Complete.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

ICE CRYSTAL (JAXA): The experiment is ongoing and nominal.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Reserve.

Marangoni Experiment for ISS in JAXA FPEF (Fluid Physics Experiment Facility): In progress.

Micro-G Clay (JAXA EPO): Complete.

MISSE (Materials ISS Experiment): Ongoing.

Moon Photography from ISS (JAXA EPO): Complete.

MSG-SAME (Microgravity Science Glovebox): Complete.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

NOA-1/-2 (Nitric Oxide Analyzer, ESA): Complete.

NUTRITION w/REPOSITORY: In progress.

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PCRF (Protein Crystallization Research Facility) Reconfiguration (JAXA): Complete.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): Planned.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): In progress.

SOLAR (Solar Monitoring Observatory): The next Sun observation window is planned to start around 12/25.

SOLO (Sodium Loading in Microgravity): Complete.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): Reserve.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1/#2 (Waving and Coiling of Arabidopsis Roots at Different g-levels): Complete/Planned.

No CEO (Crew Earth Observations) photo target uplinked for today due to lighting conditions in the northern hemisphere that place targets outside the CEO team's criteria for illumination and visibility. Normal targets are expected to return on 12/18.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

Conjunction Update: The predicted conjunction with Object 24076 (Pegasus rocket debris) today (12/13, 3:16pm EST) "went away", never requiring DAM (Debris Avoidance Maneuver) planning.

ISS Orbit (as of this morning, 8:10am EST [= epoch]):
Mean altitude -- 353.6 km
Apogee height -- 358.1 km
Perigee height -- 349.0 km
Period -- 91.61 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006767

Solar Beta Angle -- -73.4 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 26 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57675.

Significant Events Ahead *(all dates Eastern Time, some changes possible!):*
12/19/08 -- Russian EVA-21 Suited Exercise (wake 11:30pm 12/18; sleep 3:00pm 12/19);
12/22/08 -- Russian EVA-21 (wake 9:30am; hatch opening ~7:15pm; sleep 7:10am 12/23);
02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/12/09 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
08/06/09 -- STS-128/Discovery/17A – MPLM (P), LMC, last crew rotation
08/XX/09 -- Soyuz 5R/MRM2 (Russian Mini Research Module, MIM2) on Soyuz
09/XX/09 -- H-IIB (JAXA HTV-1)
11/12/09 -- STS-129/Atlantis/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P), LMC
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4
12/XX/11-- Proton 3R/MLM w/ERA.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/12/08
Date:	Friday, December 12, 2008 1:29:22 PM
Attachments:	

ISS On-Orbit Status 12/12/08

All ISS systems continue to function nominally, except those noted previously or below.

Continuing preparations for the Orlan EVA-21 on 12/22, CDR Fincke & FE-1 Lonchakov had ~90 min reserved for configuring the DC1 (Docking Compartment) and SM PkhO (Service Module Transfer Compartment) for the spacewalk dry-run on 12/19 and the EVA itself. *[Work focused on making room in these compartments by temporarily removing & relocating equipment, based on an uplinked IMS (Inventory Management System) list of 79 items. The relocation involved such items as Bioecology canisters, electronics units, Biorisk gear, BRTA-2 radio-telemetry units, a UFK cosmonaut seat, electrical umbilicals, tools, bags, etc. Also included were two Orlan spacesuits (type M & MK) which were temporarily moved, by agreement, to the US Node-2.]*

As part of the DC1 cleanup, the FE-1 performed a brief data check of the MATRYOSHKA-R (RBO-3-2) radiation suite's LULIN-5 electronics box, then removed the LULIN unit and the associated antroph-amorphous (human torso) "Phantom" unit from their locations and stowed them temporarily in the FGB. *[Data being accumulated by LULIN comprise measurement date, time, mode, three-directional flux data (per sq.cm per sec.), and three-directional dose rate.]*

Later, Lonchakov also transferred BIO-2/BIORISK-MSV containers to the SM and set them up at various sites for exposure to the local environment. *[BIORISK entails a series of experiments designed to expose samples of materials to study adaptation and changes of bacteria & fungi within the typical micro biota residing on structural materials of space-flown equipment. Early data from these experiments already point to significant effects of space flight on growth, reproduction, and biological properties of test microbes and fungi. BIORISK-KM experiments deal with "passive" materials, BIORISK-MSV with microorganisms-materials within the SM and BIORISK-MSN with microorganisms-materials outside the ISS.]*

Two additional hours were reserved for Yuri & Mike to set up EVA tools & hardware clusters in the DC1, prepare the KPU-EVA tool carrier ("caddy"), bundle the EXPOSE-R & IPI-SM monoblocs and pack the Langmuir Probe with its connectors & cables for taking outside.

FE-2 Magnus spent more time with WRS (Water Recovery System) sample analysis. *[After first installing the TOCA (Total Organic Carbon Analyzer) by connecting its power cable to the UOP1 outlet panel and hooking up its water sample hose to the WRS Rack 1, Magnus collected samples from the PWD (Potable Water Dispenser) Hot needle outlet for subsequent inflight processing using the TOCA and WMK (Water Microbiology Kit) with MCD (Microbial Capture Device) and CDB (Coliform Detection Bag). The usual water reclamation from the sample bags via an absorbing towel (to be dried by airing) and data recording after the analyses concluded the activities. This was the first time TOCA sampled from the WPA (Water Processing Assembly) hose (which had to be primed beforehand).]*

Using the ISS vacuum cleaner, Sandy worked on the OGS (Oxygen Generation System) Rack in the Lab to clean the foam sound muffler filter of its AAA (Avionics Air Assembly) and to take documentary photographs of the cleaned filter.

After inspecting the AAA, Magnus configured the OGS Rack for activation. *[Initial activation steps involved accessing the OGS Rack front and mating the O_2 outlet jumper QD (Quick Disconnect) at the N_2 Purge ORU (Orbit Replaceable Unit, LAB1PD1 panel). Sandy's preps included placing a securing tape over the OGS De-Ionizing Bed front-end cap fasteners (to prevent them from coming loose in the event of accidental internal high pressure). Powering up the OGA (Oxygen Generation Assembly), configuring its software and activating the OGA for O_2 production were then to be ground-commanded from MCC-H.]*

Yuri Lonchakov, with Mike Fincke assisting, performed the periodic (monthly) functional closure test of the Vozdukh CO_2 (carbon dioxide) removal system's spare emergency vacuum valves (AVK), in the spare parts kit. *[The AVKs are crucial because they close the Vozdukh's vacuum access lines in the event of a malfunction in the regular vacuum valves (BVK) or a depressurization in the Vozdukh valve panel (BOA). Access to vacuum is required to vent CO_2 during the regeneration of the absorbent cartridges (PP).]*

Sandra Magnus conducted the regular bi-monthly reboots of the OCA Router and File Server SSC (Station Support Computer) laptops.

Following up on the on-going X2 INTR4 software updates by the ground, the FE-2 unstowed the three Warning Books from Lab, SM and FGB and performed Part 2 of updating them with replacement pages and P&I (pen & ink) changes, for the INT R4 upgrading of INT MDMs. *[Part 1, for the new PVCU (Photovoltaic Controller Unit) MDM upgrades with PVCU R3 software, was done by Sandy on 12/10.]*

CDR Fincke unstowed and set up the NUTRITION w/Repository hardware for this weekend's sessions by himself and FE-2 Magnus for urine and blood collection. For his own blood draw tomorrow, Mike's 8-hr fast begins tonight (~7:40pm EST). *[The new NUTRITION sessions will be Mike's 60-day collection and Sandy's 30-day collection.]*

Sandy filled out the regular FFQ (Food Frequency Questionnaire), her third, on the MEC (Medical Equipment Computer). Mike Fincke's third FFQ session is currently shown on his discretionary "job jar" task list. *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

Magnus completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The FE-2 also took care of the daily IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/ import to its three databases on the ground (Houston, Moscow, Baikonur).

Working off his discretionary job list, Yuri conducted the frequent status check on the Russian BIO-5 Rasteniya-1 ("Plants-1") experiment, verifying proper operation of the BU Control Unit and MIS-LADA Module fans (testing their air flow by hand). *[Rasteniya-1 researches growth and development of plants under spaceflight conditions in the LADA-14 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP).]*

Sandra completed another one of the periodic inspections of the RED (Resistive Exercise Device) canister cords and accessories, currently done every two weeks.

In the Kibo JPM (JEM Pressurized Module), the FE-2 deactivated the UDC (Utility DC/DC Converter) and MMA (Microgravity Measurement Apparatus) components at the Ryutai Rack.

At ~3:15am EST, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~9:15am EST, CDR Fincke powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, & power supply) and conducted, at 9:20am, a ham radio session with 2 Circolo Didattico, San Giuseppe, Mola di Bari, Italy. *[The Didactic Center "San Giuseppe" is located in Mola di Bari, a city in Southern Italy. The school center includes two primary schools and three kindergartens. There are more than 800 pupils and 70 teachers. The primary schools have multimedia facilities and scientific laboratories. The pupils play an active role in a numerous projects, they gain experience on music, dance, theatre, physical education and more. Questions to Mike were uplinked beforehand. "How do you feel in Space?"; "How many satellites are flying in the Earth's orbit?"; "How do you rest onboard the ISS?"; "What studies are necessary to become an astronaut?"; "Which tools do you use when you work outside the ISS?"; "Can you see the hole in the ozone layer from the ISS?"; "How is the junction between two spaceships made?"; "Why do you have zero gravity in Space?"; "Have you ever seen anything strange outside the ISS?"; "What do you see at this moment when you look through the window of the ISS?"]*

At ~2:40pm, the ISS crew had their regular weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC (Station Support Computer).]*

At ~4:30pm, Sandy is scheduled for her weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

X2 INT R4 Software Transition Update: Starting 12/9 and running through tomorrow, MCC-Houston is executing procedures to transition several ISS MDMs (Multiplexer/Demultiplexer) computers to new software versions (without requiring crew participation). Today's transition involved the remaining INT MDM from

INTSYS R3 to R4, then swapping it to Primary. *[Last night, an unexpected failure of the PVCU (Photovoltaic Controller Unit) 2B MDM was experienced. 4B is now prime, with 2B in backup mode. The "signatures" look very similar to the 2A/4A failure that occurred earlier in the week. The anomaly is under investigation.]*

Conjunction Update: The conjunction with the Cosmos satellite debris, Object 2421, for 12/12 (Friday) at 7:45pm EST, has moved out of the threshold box. No DAM (Debris Avoidance Maneuver) planning is required. Another conjunction, with Object 24076 (Pegasus rocket debris) is being assessed. TCA: 12/13 (Saturday) at 3:16pm EST with a predicted miss distance of ~11.3 km (to be updated). Maneuver Go/No-Go: 12/12, 3:46pm.

No CEO (Crew Earth Observations) photo target uplinked for today due to lighting conditions in the northern hemisphere that place targets outside the CEO team's criteria for illumination and visibility. Normal targets are expected to return on 12/18.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 7:44am EST [= epoch]):
Mean altitude -- 353.6 km
Apogee height -- 358.2 km
Perigee height -- 349.1 km
Period -- 91.61 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006749
Solar Beta Angle -- -70.6 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 22 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57659.

Significant Events Ahead *(all dates Eastern Time, some changes possible!):*
12/19/08 -- Russian EVA-21 Suited Exercise (wake 11:30pm 12/18; sleep 3:00pm 12/19);
12/22/08 -- Russian EVA-21 (wake 9:30am; hatch opening ~7:15pm; sleep 7:10am 12/23);
02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking

02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
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04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/12/09 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
08/06/09 -- STS-128/Discovery/17A – MPLM (P), LMC, last crew rotation
08/XX/09 -- Soyuz 5R/MRM2 (Russian Mini Research Module, MIM2) on Soyuz
09/XX/09 -- H-IIB (JAXA HTV-1)
11/12/09 -- STS-129/Atlantis/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P), LMC
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4
12/XX/11-- Proton 3R/MLM w/ERA.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/11/08
Date:	Thursday, December 11, 2008 1:47:00 PM
Attachments:	

ISS On-Orbit Status 12/11/08

All ISS systems continue to function nominally, except those noted previously or below.

Continuing preparations for the Orlan EVA-21 on 12/22, CDR Fincke & FE-1 Lonchakov started out with the mandatory Russian pre-EVA MedOps procedure MO-6 (Hand-Cycle Ergometry) in the SM (Service Module), assisting each other in turn and supported by tagup with ground specialists on DO2 (~4:05pm EST), who are to clear them for spacewalking. *[Because cosmonauts in early Russian programs have shown noticeable decrease in arm muscle tone, TsUP/IBMP (MCC-Moscow/Institute of Biomedical Problems) physical fitness experts have groundruled the handgrip/arm tolerance test analysis (hand ergometry) as a standard pre-Orlan EVA requirement. For MO-6, the subject dons the ECG (electrocardiogram) biomed harness, attaches three skin electrodes and plugs the harness into the PKO medical exam panel on the cycle ergometer. The other crewmember assists. The 30-min exercise itself starts after 10 seconds of complete rest, by manually rotating the cycle's pedals, set at 150 W, backwards until "complete exhaustion".]*

Second on the list of spacewalk preparations for Lonchakov & Fincke was a 2-hr. task of locating and readying Russian EVA equipment & tools, supported by an uplinked list of 31 items and a specialist tagup. *[Yuri & Mike gathered the KPU tool “caddy” with hammer, cutter, pry bar and scissors, the EXPOSE-R, Langmuir Probe & IPI-SM payload monoblocs, cable reels, clamps, bungees, tethers, wire ties, cotton gloves, etc.]*

Later, getting set up for the standard suited dry run on 12/19, the FE-1 & CDR also readied and checked out replaceable components (OTA) and auxiliary gear for their particular Orlan "skafandr" suits. *[These include portable primary & reserve O_2 tanks (BK-3), storage batteries (825M3), LiOH canisters (PL-9), moisture collectors, liquid cooling garments (KVO), comm headsets (ShL-10),*

gloves (GP-10K), thermal comfort undergarments (BK-10), socks, diapers, filters for feedwater lines (FOR), Orlan CO_2 measurement units (IK), degassing pump unit (BOS), etc. One of the Orlan suits will have to be temporarily stowed in the USOS (Node-2) to make room for the EVA in the DC1.]

For his daily work on the new WRS (Water Recovery System), Mike Fincke reconfigured the UPA (Urine Processor Assembly) to draw urine from a Russian EDV-U container instead of the newly installed WHC (Waste & Hygiene Compartment), then filled the UPA WSTA (Water Storage Tank Assembly) with EDV-U pretreated urine. *[During the activation process on 12/9 the UPA shut down due to a "low waste tank quantity" sensor reading. Approximately 500 mL of urine were found to have back-flowed from UPA into the WHC, probably into a hose launched "dry" (empty) since a careful search by the crew found no leak. Today Mike refilled the WSTA, and the UPA was restarted nominally, without glitch. Note: Recycled water from the US PWD (Potable Water Dispenser) may now be used by the crew for non-oral hygiene purposes, pending confirmation that NASA water specialists have cleared PWD analysis results with RS specialists.]*

Mike Fincke & Yuri Lonchakov both took the periodic O-OHA (on-orbit hearing assessment) test, a 30-min. NASA environmental health systems examination to assess the efficacy of acoustic countermeasures, using a special MEC (Medical Equipment Computer) laptop application. It was Mike's & Yuri's second O-OHA test; Sandra Magnus had her first test on 11/23. *[The O-OHA audiography test involves minimum audibility measurements for each ear over a wide range of frequencies (0.25-10 kHz) and sound pressure levels, with the crewmembers using individual-specific Prophonics earphones, new Bose ANC headsets (delivered on 30P) and the SLM (sound level meter). To conduct the testing, the experimenter is supported by special EarQ software on the MEC, featuring an up/down-arrow-operated slider for each test frequency that the crewmember moves to the lowest sound pressure level at which the tone can still be heard. The baseline test is required not later than about Flight Day 14 for each new Expedition and is then generally performed once per month. Note: There have been temporary hearing deficits documented on some U.S. and Russian crewmembers, all of which recovered to pre-mission levels.]*

In the JAXA JLP (JEM Logistics Module Pressurized Section), FE-2 Magnus prepared for the JLP EFU13 (Exposed Facility Unit 13) checkout by setting up and connecting SLT-2 (System Laptop Terminal 2) to the JLP EDU (EEU/ Experiment Exchange Unit Driver Unit), then performing the checkout and afterwards cleaning up, stowing SLT-2 and all cables. *[The Kibo EF (Exposed Facility) will be delivered next May on Flight 2J (STS-127/Endeavour), along with the ELM-ES (Experiment Logistics Module-Exposed Section).]*

In the COL (Columbus Orbital Laboratory), Magnus prepared the WAICO (Waving & Coiling of Arabidopsis at Different Gravity Levels) experiment in the BLB (Biolab) for operation by transferring eight newly arrived ECs (Experiment Containers) from Progress 31P and installing them in the BLB's TCU (Thermal Control Unit), after removing the TCU's AAS (Automatic Ambient Stowage) insert and ATCS (Active Thermal Control System) insert/insulation.

Fincke completed the weekly 10-min. CWC (Contingency Water Container) inventory as part of on-going WRM (Water Recovery & Management) assessment of onboard water supplies. Updated "cue cards" based on the crew's water calldowns are sent up every other week. *[The new card (18-0006G) lists 39 CWCs (~1,272.9 L total) for the four types of water identified on board: technical water (695.8 L, for Elektron electrolysis), potable water (530.4 L, incl. 174.6 L currently off-limit because of* Wautersia *bacteria), condensate water (0.0 L), waste/ EMU dump and other (46.7 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

It was Mike's turn to prepare the MELFI (Minus Eighty Degree Laboratory Freezer for ISS) for future samples, by completing the sixth ICEPAC insertion into MELFI after ULF-2, today retrieving another two -32 degC ICEPAC belts and placing them into Dewar 1, Tray C/Section 1 & 4 for cooling down.

The CDR also performed the regular 30-day inspection of the new AED (Automated External Defibrillator) in the CHeCS (Crew Health Care Systems) rack. *[The AED is a portable electronic device that automatically diagnoses the potentially life threatening cardiac arrhythmias of ventricular fibrillation and ventricular tachycardia in a patient. It then can treat them through defibrillation, i.e., the application of electrical therapy which stops the arrhythmia, allowing the heart to re-establish an effective rhythm. AEDs are generally either held by trained personnel who will attend events or are public access units which can be found in places including corporate and government offices, shopping centers, airports, restaurants, casinos, hotels, sports stadiums, schools and universities, community centers, fitness centers, health clubs and any other location where people may congregate.]*

The FE-1 collected the periodic readings of potentially harmful atmospheric contaminants in the SM, using the CMS (Countermeasure System), a component of the SKDS GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, today using preprogrammed microchips to measure for o-Xylol (1,2-Dimethylbenzol, C_8H_{10}) and Methyl-Mercaptan (Methanethiol, CH_4S).

Sandy checked out the US SLM (Sound Level Meter) instrument and then used it to conduct the periodic noise level measurements program in the station interior for a 2-hr acoustic survey, including transfer of the recorded data to the MEC (Medical Equipment Computer). *[A total of 46 acoustic measurements were obtained, specifically at 14 locations in the Lab, 12 locations in the SM, three locations in the A/L (US Airlock), seven locations in COL, and eight locations in Node-2. The survey also includes two crew preference locations taken at their perceived loudest locations in the station. The SLM gives instantaneous noise levels and their frequency spectra, which are transferred to the MEC laptop via an RS232 cable and later downlinked with regular CHeCS (Crew Health Care Systems) data dump or via OCA.]*

Yuri completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The FE-1 also took care of the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Magnus meanwhile conducted the monthly 50-min FDS PEP (Fire Detection & Suppression/Portable Emergency Provisions) safety inspection/audit in the ISS modules. *[The IMS-supported inspection verifies that PFEs (Portable Fire Extinguishers), PBAs (Portable Breathing Apparatus) and EHTKs (Extension Hose/ Tee Kits) are free of damage to ensure their functionality and to track shelf life/life cycles on the hardware.]*

Before the crewmembers started their exercise sessions on the TVIS, the FE-2 set up the video equipment for filming the subsequent workouts on the treadmill for biomechanical evaluation of their performance and assessment of the hardware status by ground engineers. Afterwards, the camera gear was torn down & stowed and the video recording prepared for downlinking.

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1). *[For Sandy, the TVIS video run, with a full body FOV (field of view), was her 30-day requirement, while Mike & Yuri fulfilled their 60-90-day requirement which calls for a FOV that includes the hip and feet striking the running belt.]*

Magnus today had 30 min. to herself for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residence, if she/he chooses to take it.

X2 INT R4 Software Transition Update: Starting 12/9 and running through the weekend ahead, MCC-Houston is executing procedures to transition several ISS MDMs (Multiplexer/Demultiplexer) computers to new software versions (without requiring crew participation). Today's transition involved one INT MDM from INTSYS R3 to R4 software (leaving it in Primary), the LA-1 MDM from LSYS-1 R3 to R4, the LA-2 MDM from LSYS-2 R2 to R3, the Node-2-1 MDM from N2SYS-1 R1 to R2 and the Node-2-2 MDM from N2SYS-2 R1 to R2. *[After an unexpected transition of the PVCU (Photovoltaic Controller Unit) 4A MDM out of Primary, the MDM was switched back to Primary yesterday, with the applicable Flight Rule (not making a suspect MDM prime) waived to collect data and to maintain operating all MDMs on the same software version. The remaining PVCU 4 software transition will continue on 12/14 (Sunday); non-PVCU 4 portion of transition continues as scheduled.]*

Conjunction Update: Another TCA (Time of Closest Approach) is currently being assessed for a new conjunction with the Cosmos satellite, Object 2421, for 12/12 (Friday) at 7:45pm EST. Miss distance currently estimated at ~8.76 km. MCC-Houston will work DAM (Debris Avoidance Maneuver) options with TsUP-Moscow if needed. This recurring object requires continued monitoring.

EVA-21 Timeline Preview (preliminary): The Orlan EVA-21 by Lonchakov (EV1) & Fincke (EV2) on 12/22 is scheduled to begin at ~7:15pm EST (DC1 EV hatch open), to last an estimated 6 hrs 10 min, i.e., concluding at approximately 1:25am. Russian attitude thrusters will be inhibited by TsUP ground commanding at specific times when the spacewalkers work on the SM RO (Working Compartment, l.d./large diameter) and SM AO (Assembly Compartment). Main objectives of the EVA are –

- Install a Langmuir Probe on the DC1 Docking Compartment;
- Install & connect the EXPOSE-R monobloc unit on the SM RO l.d.;
- Install & connect the IPI-SM monobloc unit of the IMPULSE experiment on the RO l.d.;
- Remove/return the BIORISK-MSN payload container #2 from the DC1;
- Conduct "SWG" Project timer operations;
- Remove fasteners (Aramide straps) near docking target and AR-VKA & 2AR-VKA antennas installation on DC1 (if time permits);
- Close MLI (Multi-Layer Insulation) flap on SM FP-10 connector patch (if time permits);
- Re-install SKK #9 removable cassette container in nominal position (if time permits); and

- Monitor conditions ISS RS exterior and structure components ("Panorama-2008" DTO, if time permits).

Uncrewed Station Ops Preview: One of the contingencies associated with the Orlan EVA-21 could require uncrewed station operation for some time. Progress M-01M/31P will be prepared for ground-commanded contingency undocking. Most of the USOS (US Segment) preparations for this eventuality will be done by Mike Fincke & Sandy Magnus next week, such as transferring selected hardware to the RS (Russian Segment), setting up a PCS (Portable Computer System) laptop in the FGB as backup to the PCS in the RS, powering down ham/amateur radio equipment, reconfiguring some LAN software (NetMeeting, KFX), powering down the COL PWS (Columbus Orbital Laboratory Portable Workstation) laptop, and closing selected hatches. The IATCS (Internal Thermal Control System) will be configured as usual for uncrewed ops, some racks will be jumpered to the LTL (Low Temperature Loop) in case they need cooling, and some remaining hatches will be closed, before Sandy moves to the Soyuz Descent Module (SA) and closes the hatch between it and the Orbital Module (BO).

No CEO (Crew Earth Observations) photo target uplinked for today due to lighting conditions in the northern hemisphere that place targets outside the CEO team's criteria for illumination and visibility. Normal targets are expected to return on 12/18.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this noon, 12:01pm EST [= epoch]):
Mean altitude -- 353.6 km
Apogee height -- 358.2 km
Perigee height -- 349.1 km
Period -- 91.61 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006778
Solar Beta Angle -- -66.9 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 11 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57646.

Significant Events Ahead *(all dates Eastern Time, some changes possible!):*
12/19/08 -- Russian EVA-21 Suited Exercise (wake 11:30pm 12/18; sleep 3:00pm 12/19);
12/22/08 -- Russian EVA-21 (wake 9:30am; hatch opening ~7:15pm; sleep 7:10am 12/23);

02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/12/09 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch

Six-person crew on ISS

08/06/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
08/XX/09 -- Progress/MRM2 (Russian Mini Research Module, MIM2) on Soyuz
09/XX/09 -- H-IIB (JAXA HTV-1)
11/12/09 -- STS-129/Endeavour/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/10/08
Date:	Wednesday, December 10, 2008 1:29:42 PM
Attachments:	

ISS On-Orbit Status 12/10/08

All ISS systems continue to function nominally, except those noted previously or below.

Before breakfast & first exercise, CDR Fincke, FE-1 Lonchakov & FE-2 Magnus completed a full session with the Russian medical assessment MO-9/Biochemical Urinalysis. Afterwards, the FE-1 closed out and stowed the Urolux hardware. *[MO-9 is conducted every 30 days (and also before and after EVAs) and is one of five nominal Russian medical tests adopted by NASA for U.S. crewmembers for IMG PHS (Integrated Medical Group/Periodic Health Status) evaluation as part of the "PHS/Without Blood Labs" exam. The analysis uses the sophisticated in-vitro diagnostic apparatus Urolux developed originally for the Mir program. Afterwards, the data are entered in the MEC (Medical Equipment Computer)'s special IFEP software (In-Flight Examination Program).]*

Later, Yuri undertook his first periodic (generally monthly) health test with the cardiological experiment PZEh MO-1 ("Study of the Bioelectric Activity of the Heart at Rest") on the TVIS (Treadmill with Vibration Isolation System), with Mike assisting as CMO (Crew Medical Officer). *[Equipment used were VPG/Temporal Pulsogram and ECG/Electrocardiogram Data Output Devices (USI). During the 30-min. test, the FE-1 tagged up with ground specialists on an RGS (Russian Groundsite) pass at ~5:16am EST via VHF for data downlink from the VPG and Gamma-1M ECG for about 5-6 minutes.]*

Lonchakov also loaded new software (vers. 3.0) on the Russian BSMM (Multi-Channel Matching Unit) payload computer from a CD on the RSS1 laptop. After the software installation, communications between the BSMM computer and the RSS1 laptop were checked with the RSC-Energia PingMaster application. *[BSMM is part of the OpsLAN (Operations Local Area Network), which also includes such items as the BSPN (Payload Server), OBC (Onboard Controller) for RokvISS, and GTS (Global Timing System).]*

CDR Fincke performed a run with the MedOps experiment WinSCAT (Windows Spaceflight Cognitive Assessment Tool), his first onboard session, by logging in on the MEC and conducting the psychological evaluation exercise on the laptop-based WinSCAT experiment. *[WinSCAT is a monthly time-constrained questionnaire test of cognitive abilities, routinely performed by astronauts aboard the ISS every 30 days before or after the PHS (periodic health status) test or on special CDR's, crewmembers or flight surgeons request.]*

In the Kibo JPM (Japanese Pressurized Module), FE-2 Magnus supported Tsukuba flight controllers by configuring the CB (Clean Bench) subrack facility for inactivity and stowage. *[Ground commanding of JPM payloads is done by JAXA's SSIPC (Space Station Integration & Promotion Center) at Tsukuba/Japan. The CB, a subrack of the Saibo ("living cell") Rack, provides a germ-free environment for life science and biotechnological experiments. It has a specially designed microscope that operates with bright-field, phase-contrast and fluorescence modes.]*

It was Sandra's turn today to prepare the MELFI (Minus Eighty Degree Laboratory Freezer for ISS) for future samples, by completing the fifth ICEPAC insertion into MELFI after ULF-2, today retrieving another two -32 degC ICEPAC belts and placing them into Dewar 1, Tray B/Section 3 & 4 for cooling down.

The crew conducted the regular fire drill/OBT (on-board training), a mandatory periodic one-hour exercise (including ground debrief conference). *[Primary goal of this Russian-led interactive exercise is to maintain crew skills in responding to a fire and to provide the station residents with the most realistic emergency training possible. The drill is always conducted with the support of all MCCs (TsUP-Moscow, MCC-Houston, COL-CC, SSIPC/Tsukuba) in close coordination. It should be performed every 2.5 months, but not later than 1 month prior to end of Increment. OBT objectives are to (a) practice fire response procedures (FRPs) and all incorporated actions for the case of a software-detected fire to locate, extinguish, and verify extinguishing attempts; (b) browse through RS laptop and the Signal-VM fire detection system displays as well as the automated software (algorithms) response to the fire event; (c) practice crew communication necessary to perform emergency FRPs; (d) ensure familiarization with support equipment (CSA-CP compound specific analyzer-combustion products, PBAs portable breathing assemblies, PFE/OSP-4 portable fire extinguishers, and IPK-1M gas masks to be used for fire suppression). These exercises do not actually use any fire equipment but simulate such actions with comm channels, PBAs, CSA-CP and laptop displays to the maximum extent possible. The Emergency Procedures OBT concluded with a 15-min. debrief with Russian/U.S. ground specialists at ~1:50pm EST via S-band.]*

Fincke retrieved and stowed the four passive FMK (Formaldehyde Monitoring Kit) sampling assemblies deployed by Magnus on 12/8 in the Lab (at P3, below CEVIS)

and Service Module (SM, at the most forward handrail, on panel 307), to catch any atmospheric formaldehyde on a collector substrate for subsequent analysis on the ground. *[Two monitors each are usually attached side by side, preferably in an orientation with their faces perpendicular to the direction of air flow.]*

Sandy completed the routine daily servicing of the SM's SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

As part of the SOZh servicing, the FE-2 conducted the periodic checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the passageways SM PrK (Service Module Transfer Compartment)–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, and FGB GA–Node-1.

Magnus also performed the regular daily IMS (Inventory Management System) maintenance task by updating/editing the IMS standard "delta file" including stowage locations for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Afterwards, Sandy completed the periodic status check on the running payloads CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) and ENose (Electronic Nose), both located in the ER-2 (EXPRESS Rack 2).

The FE-2 also completed the visual "T+2 Day" microbial (bacterial & fungal) analysis of the potable water samples collected on 12/8 from the WRS (Water Recovery System) and processed on board with the MCDs (Microbial Capture Devices) and CDBs (Coliform Detection Bags). *[WRS samplings are regularly conducted for 90 days, specifically every 4 days: WRS water hose (TOCA inflight analysis) & microbial bag sample (inflight bacterial visual enumeration plus archival for return on 15A), every 8 days: an archival water sample (return on 15A), and monthly: a TOCA bag sample from PWD (tested inflight). Coliform bacteria are the commonly-used bacterial indicator of sanitary quality of foods and water. They are defined as rod-shaped Gram-negative non-spore forming organisms that ferment Lactose with the production of acid and gas when incubated at 35-37 degC. Coliforms are abundant in the feces of warm-blooded animals, but can also be found in the aquatic environment, in soil and on vegetation. In most instances, coliforms themselves are not the cause of sickness, but they are easy to culture and their presence is used to indicate that other pathogenic organisms of fecal origin may be present.]*

After repositioning and activating the MATRYOSHKA-R (RBO-3-2) radiation instrumentation in the SM (panel 326) yesterday, Yuri Lonchakov removed the newly installed PCMCIA (Portable Computer Memory Card International Adapter) ALC-957 card from the AST Spectrometer for a functions check, reviewing and archiving its files on the RSK-1 laptop and later inserting the memory card again in the AST for more recording. *[RBO-3-2 is using the ESA/RSC-Energia experiment ALTCRISS (ALC/Alteino Long Term monitoring of Cosmic Rays on the ISS) with its AST Spectrometer and ALC equipment in the SM.]*

Following up on the on-going X2 INTR4 software updates by the ground, Sandra Magnus unstowed the three Warning Books from Lab, SM and FGB and updated them, in Part 1, with replacement pages and P&I (pen & ink) changes for the new PVCU (Photovoltaic Controller Unit) MDM upgrades with PVCU R3 software. Part 2, for the INT R4 upgrading of INT MDMs, will follow at a later date. *[See also update note, below.]*

Sandy also worked in the COL (Columbus Orbital Laboratory), unlocking the GEOFLOW FSL FCE (Fluid Science Laboratory/Facility Core Element), which had been locked for recent vehicle traffic such as 30P undocking and 31P docking for protection. *[This task, yesterday shown on the discretionary "job jar" list, was today hard scheduled for the FE-2.]*

In continuing preparations for the upcoming Russian Orlan EVA-21 on 12/22 (Monday), FE-1 Lonchakov & CDR Fincke conducted a four-hour review of familiarization material, watching a training video and studying the preliminary EVA timeline (details, see below). *[More preparations will include MO-6 Hand Ergometry & Orlan equipment gathering tomorrow (12/11), Orlan and EVA tools/ equipment configuring on 12/12, MO-5 Cardiovascular Evaluation on 12/16 & 12/16, Progress 31P preparations for contingency undocking on 12/17, etc.]*

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1/MO-1, FE-2), RED (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Sandy again had an hour to herself for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residence, if she/he chooses to take it.

At ~3:30am EST, Yuri Lonchakov downlinked two PAO TV messages of greetings and congratulations, one to the Republic of Kazakhstan on its Independence Day (Kazakhstan proclaimed its independence from the former Soviet Union on

December 16, 1991, and Nursultan Nazarbayev was democratically elected the first President of the country), the other to the Awards Department of the Russian Federation's Ministry of Defense on its 30th anniversary.

At ~5:05am, Sandra Magnus powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, & power supply) and conducted, at 5:10am, a 10-min. ham radio session with Istituto Comprensivo "Marco Polo" in Grado, Italy. *[Grado is a little town on the northernmost coast of the Adriatic Sea, 80 km east of Venice, between the rivers Isonzo & Tagliamento. It has a remarkable history: it was under the Roman Empire, it defended the inhabitants against Attila in 452 AD; it became Austrian after the Treaty of Campo Formio in 1797 and again Italian after the 1st World War. Today, Grado has 8600 inhabitants and the economy is based on tourism and fishing industry. The "Marco Polo" is a secondary school but it includes also a primary school. 550 students attend the school. Questions to Sandy were uplinked beforehand. "How many spacesuits do you have onboard and what kind of spacesuits do you use for the extra-vehicle-activities?"; "How much time can you stay outside during an EVA?"; "Do you use spacesuits equipped with rockets to move around the ISS?"; "Were you instructed to repair all the station's equipment?"; "How much time would it take to change the ISS' orbit in order to avoid an impact with space debris?"; "What kind of experiments are you doing during this mission and what are they useful for?"; "How many experiments are you supervising every day?"; "Is every astronaut trained just for special tasks or can everybody do everything onboard?"; "What repair parts do you have on board?"; "For how much time does the ISS' air supply last?"; "Do you think that you will participate in the assembling of another space station in the future?".]*

Working off his discretionary job list, Yuri conducted the frequent status check on the Russian BIO-5 Rasteniya-1 ("Plants-1") experiment, verifying proper operation of the BU Control Unit and MIS-LADA Module fans (testing their air flow by hand). *[Rasteniya-1 researches growth and development of plants under spaceflight conditions in the LADA-14 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP).]*

EVA-21 Timeline Preview (preliminary): The Orlan EVA-21 by Lonchakov (EV1) & Fincke (EV2) on 12/22 is scheduled to begin at ~7:15pm EST (DC1 EV hatch open), to last an estimated 6 hrs 10 min, i.e., concluding at approximately 1:25am. Russian attitude thrusters will be inhibited by TsUP ground commanding at specific times when the spacewalkers work on the SM RO (Working Compartment, l.d./large diameter) and SM AO (Assembly Compartment). Main objectives of the EVA are –

- Install a Langmuir Probe on the DC1 Docking Compartment;
- Install & connect the EXPOSE-R monobloc unit on the SM RO l.d.;
- Install & connect the IPI-SM monobloc unit of the IMPULSE experiment on

the RO l.d.;

- Remove/return the BIORISK-MSN payload container #2 from the DC1;
- Conduct “SWG” Project timer operations;
- Remove fasteners (Aramide straps) near docking target and AR-VKA & 2AR-VKA antennas installation on DC1 (if time permits);
- Close MLI (Multi-Layer Insulation) flap on SM FP-10 connector patch (if time permits);
- Re-install SKK #9 removable cassette container in nominal position (if time permits); and
- Monitor conditions ISS RS exterior and structure components (“Panorama-2008” DTO, if time permits).

Uncrewed Station Ops Preview: One of the contingencies associated with the Orlan EVA-21 could require uncrewed station operation for some time. Progress M-01M/31P will be prepared for ground-commanded contingency undocking. Most of the USOS (US Segment) preparations for this eventuality will be done by Mike Fincke & Sandy Magnus next week, such as transferring selected hardware to the RS (Russian Segment), setting up a PCS (Portable Computer System) laptop in the FGB as backup to the PCS in the RS, powering down ham/amateur radio equipment, reconfiguring some LAN software (NetMeeting, KFX), powering down the COL PWS (Columbus Orbital Laboratory Portable Workstation) laptop, and closing selected hatches. The IATCS (Internal Thermal Control System) will be configured as usual for uncrewed ops, some racks will be jumpered to the LTL (Low Temperature Loop) in case they need cooling, and some remaining hatches will be closed, before Sandy moves to the Soyuz Descent Module (SA) and closes the hatch between it and the Orbital Module (BO).

X2 INT R4 Software Transition: Starting yesterday and running through 12/12, MCC-Houston is executing procedures to transition several ISS MDMs (Multiplexer/ Demultiplexer) computers to new software versions. No crew participation is required. Today’s transition involves the second of each pair of PVCU (Photovoltaic Controller Unit) MDMs from PVCA R2 to PVCA R3. This concludes the transition of all six PVCU MDMs.

Conjunction Update: One TCA (Time of Closest Approach) is currently being assessed for another conjunction with the Cosmos satellite, Object 2421, for tonight at 6:57pm EST. No DAM (Debris Avoidance Maneuver) is needed, but specialists believe that this recurring object requires continued monitoring.

CEO (Crew Earth Observations) photo target uplinked for today was Pilcomayo River and megafan, Paraguay *(crews have difficulty locating this large river that exits the Andes Mts. because it stops flowing, for unknown reasons, near the Andes. [Slight tectonic subsidence is the probable explanation since its flow has*

remained steady for decades]. The neighboring Bermejo River just south is more visible because its flow reaches the main Parana trunk river. Requested were oblique panoramas looking left to help orient future crew imaging of the Pilcomayo River and megafan. [By switching courses repeatedly and depositing its sediment over millions of years, this river has produced the largest megafan on Earth, occupying 220,000 sq.km, that is, all of western Paraguay).

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

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Revolutions since FGB/Zarya launch (Nov. 98) -- 57628.

Significant Events Ahead *(all dates Eastern Time, some changes possible!):*
12/22/08 -- Russian EVA-21 (hatch opening ~7:15pm)
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02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
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02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
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04/07/09 -- Progress 32P undocking & deorbit
05/12/09 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
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Six-person crew on ISS
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04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/09/08
Date:	Tuesday, December 09, 2008 2:22:37 PM
Attachments:	

ISS On-Orbit Status 12/09/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Fincke unstowed, set up and activated the hardware for the new ENose (Electronic Nose) experiment on ER2 (EXPRESS Rack 2) in the US Lab. *[ENose, which monitors the station's interior for harmful chemicals such as ammonia, mercury, methanol and formaldehyde, running continuously and autonomously, is the first instrument aboard ISS which can detect and quantify chemical leaks or spills as they happen. If the experiment is successful, ENose might be used in future space missions as part of an automated system to monitor and control astronauts' in-space environments. The shoebox-sized ENose contains an array of 32 sensors that can identify and quantify several organic and inorganic chemicals, including organic solvents and marker chemicals that signal the start of electrical fires. The sensors are polymer films that change their electrical conductivity in response to different chemicals, where the pattern of the sensor array's response depends on the particular chemical types present in the air. The instrument can analyze volatile aerosols and vapors, help monitor cleanup of chemical spills or leaks, and enable more intensive chemical analysis by collecting raw data and streaming it to a computer at JPL's ENose laboratory. The instrument, weighing less than nine pounds and requiring only 20 watts of power, has a wide range of chemical sensitivity, from fractional parts per million to 10,000 parts per million. Its data-analysis software can identify and quantify the release of chemicals within 40 minutes of detection. While ENose will look for 10 chemical types in this six-month experiment, it can be "trained" to detect many others.]*

In the SM (Service Module), FE-1 Lonchakov continued spent another 3 hrs on the time-consuming work of installing and connecting cables for the Progress 31P-delivered new payload EXPOSE-R which he and CDR Fincke will install externally during the Russian EVA-21 on 12/22. The outfitting was supported by ground

specialist tagup were required. *[EXPOSE-R comprises a suite of nine ESA astrobiology experiments with organisms to be exposed to solar UV (ultraviolet), vacuum, cosmic rays and perpetual temperature variations as the station passes through areas of direct sunlight and the cold darkness of Earth's shadow. EXPOSE-R is equipped with three trays which are loaded with a variety of biological samples including plant seeds and spores of bacteria, fungi and ferns. They will be exposed to the harsh space environment for about one and a half years. EXPOSE-R will join EXPOSE-E, a similar & complementary set of trays filled with terrestrial organisms which is already installed on the outside of the Columbus module as one of the nine payloads of the EuTEF (European Technology Exposure Facility). At the end of the exposure period, the EXPOSE-R trays will be retrieved from their location and returned to Earth with a Russian Soyuz spacecraft.]*

After deactivation/reactivation of the BITS1-12 & VD-SU control mode, required for the EXPOSE installations, the FE-1 performed the regular check on the BRI Smart Switch Router computer and its Ethernet connection to assess any impact of these activities on Ethernet comm. *[BRI is part of the RS OpsLAN (Russian Segment/ Operations Local Area Network), with connections to the three SSC clients, the Ethernet tie-in with the US network, and a network printer in the RS.]*

Afterwards, Yuri also supported the reactivation of the Elektron oxygen generator at 32 amps by the ground by monitoring the external temperature of its secondary purification unit (BD) for the first 10 minutes of operations to ensure that there was no overheating. *[The gas analyzer used on the Elektron during nominal operations for detecting hydrogen (H_2) in the O_2 line (which could cause overheating) is not included in the control algorithm until 10 minutes after Elektron startup. Elektron had been turned off for yesterday's installation of a new EMI filter and today's cabling work (which included making connections to the BITS2-12 Onboard Telemetry Measurement System).]*

After performing the periodic hot water flush of the PWD (Potable Water Dispenser), CDR Fincke worked for the next three hours on the WHC (Waste & Hygiene Compartment), activating and checking out the system (by self-test). The WHC activation was cut short by a premature UPA (Urine Processing Assembly) shutdown. *[Before turning on the pretreat & water pump, Mike verified that all three handwheel-driven valves (RU-2, RU-4, RU-5) were in the Open position.]*

Working ~2.5 hrs in the JAXA JPM (Japanese Experiment Module), FE-2 Magnus repackaged eight cables of the JEM Robotics BDS (Backup Drive System) in a stowage bag for consolidation, making room in a larger CTB (Cargo Transfer Bag, J-T1) for stowing an HCTL (Heater Controller) which she then removed in the "neighboring" JLP (JEM Logistics Pressurized Segment) from the Ovhd Stbd

Endcone location, replacing it with an EDU (Equipment Exchange Unit Driver Unit) for future JLP EFU (Exposed Facility Unit) operations.

Yuri Lonchakov conducted the periodic data collection on the long-term BIO-5 Rasteniya-1 ("Plants-1") experiment, copying data from its built-in control computer to a PCMCIA memory card for subsequent downlink to the ground via OCA. *[Rasteniya-1 researches growth and development of plants under spaceflight conditions in the LADA-14 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). The payload hardware includes a module (MIS/Module for the Investigation of Substrates), the MIS control unit (BU), a nitrogen purge unit (BPA) and other accessories. During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. LADA consists of a wall-mounted growth chamber that provides long-term, ready access for crewmember interaction. It provides light and root zone control but relies on the cabin environmental control systems for humidity, gas composition, and temperature control. Cabin air is pulled into the leaf chamber, flows over the plants and vents through the light bank to provide both plant gas exchange and light bank cooling.]*

Performing regular service on the MATRYOSHKA-R (RBO-3-2) radiation instrumentation in the SM (panel 326), the FE-1 changed the position of the AST Spectrometer and kits containing passive dosimeters on Panel 326 (rotation around their axes), installed the ALC-957 PCMCIA (Portable Computer Memory Card International Adapter) memory card and activated the Spectrometer, making sure that the memory card is actually recording data. *[RBO-3-2 is using the ESA/ RSC-Energia experiment ALTCRISS (ALC/Alteino Long Term monitoring of Cosmic Rays on the ISS) with its Spectrometer (AST) and ALC equipment, which is periodically moved around and now located again in the SM.]*

Sandra Magnus took GSC (Grab Sample Container) air samples in the center of the Lab, SM (Service Module) and COL (Columbus Orbital Laboratory), while Yuri Lonchakov used the Russian AK-1M absorber to collect air samples in the SM & FGB, recording date, time & location. Kits and pouches were then stowed for return to Earth.

In the RS (Russian Segment), Mike Fincke worked on the SM ASU (Toilet Facility), performing the monthly 30-min. maintenance/servicing of the facility by changing out replaceable ASU parts with new components, i.e., the urine receptacle (MP) and a filter insert (F-V). The old parts were discarded as trash.

Yuri pumped water from the Progress 31P’s BV2 Rodnik tank to the ISS, filling two EDV containers.

Mike completed the fourth ICEPAC insertion into the MELFI (Minus Eighty Degree Laboratory Freezer for ISS) after ULF-2, today retrieving another two -32 degC ICEPAC belts and placing them into Dewar 1, Tray D/Section 3 & 4.

For her physical workout on the RED (Resistive Exercise Device), Sandra set up the video camcorder for filming and recording the sessions via ground commanding. Afterwards, the video equipment was put back in stowage, and the video was to be downlinked from the VTR (Video Tape Recorder) by ground commanding. *[The RED video, showing the apparatus on the "ceiling" hatch of the Node, is periodically required to support biomechanical evaluation of the exercising crewmember and assessment of the on-orbit setup of equipment during data collection.]*

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Sandy Magnus performed the monthly & quarterly TVIS treadmill maintenance. *[The inspection checks out the TVIS in the current SLD (subject loading device) contingency configuration, primarily looking at the condition of the SPDs (subject positioning devices) with clamp/rope assembly wire rope isolators for fraying and damage, and recording time & date values.]*

Yuri completed the routine daily servicing of the SM's SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

The FE-2 took care of the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew had their periodic PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Sandy at ~9:05am, Mike at ~9:45am, and Yuri at ~1:30pm EST.

Sandy again had an hour to herself for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residence, if she/he chooses to take it.

At ~10:40am, Magnus powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, & power supply) and conducted, at 11:45am, a ham radio session with Stephen F. Austin Elementary School, Richmond, Texas. *[The students at Stephen F. Austin Elementary School in Richmond, Texas have studied space and the identifying characteristics of objects in our solar system, including the sun, planets and moon. Each year the fifth grade students participate in a simulated space shuttle mission, performing tasks that would happen on a regular shuttle flight. Each grade level is involved in some manner with the various missions that occur throughout the day. The school has integrated the ARISS contact as part of this activity. Questions to Sandy were uplinked beforehand. "How would you be rescued if you floated off during a spacewalk?"; "What does a hurricane look like from the Space Station?"; "Do you burn calories the same way in space as on Earth?"; "Have you ever seen the Aurora Borealis from space?"; "Has an asteroid ever hit the space station?"; "Is sleeping on the space station difficult because you are weightless?"; "Do you tell the time the same way in space as on Earth?"; "What is the most life-changing experiment you have done?"; "Have you seen any unusual objects floating around in space?"; "How do you train for zero gravity?".]*

At ~11:45am, Mike & Sandra supported a 20-min. Educational PAO TV event with 5th & 6th grade students at Corpus Christi, TX, assembled in STARBASE Atlantis.

A new task item added to Sandy's & Mike's discretionary "job jar" is to unlock the GEOFLOW FSL FCE (Fluid Science Laboratory/Facility Core Element) in the COL, which had been locked for recent vehicle traffic such as 30P undocking and 31P docking.

A second voluntary "job jar" task concerns cargo bag reconfiguration and stowage in the JAXA JPM, today already started by the FE-2.

MSS Software Upgrade: Yesterday, MCC-Houston successfully uplinked a software upgrade for the Mobile Servicing System, from Vers. 5.1 to 5.2, to all three C&C MDMs (Command & Control Multiplexer/Demultiplexers). Today, the SPDM (Special Purpose Dexterous Manipulator) was powered up from the ground as a partial software checkout, and in preparation for next week's SPDM on-orbit checkout session 2.

X2 INT R4 Software Transition: Starting today and running through 12/12, MCC-Houston is executing procedures to transition several ISS MDMs to new software versions. No crew participation is required. Today's transition involves one of each pair of PVCU (Photovoltaic Controller Unit) MDMs from PVCA R2 to PVCA R3. The PVCA R3 MDM will be left in Primary.

MT Translation: After the normal pre-site video survey, the Mobile Transporter was successfully translated yesterday from WS7 (Worksite 7) to WS4 via ground commanding.

WRM Update: An updated WRM (Water Recovery Management) "cue card" was uplinked yesterday for the crew's reference, updated with the latest water audit. *[The new card (18-0006G) lists 39 CWCs (~1,272.9 L total) for the four types of water identified on board: technical water (695.8 L, for Elektron electrolysis), potable water (530.4 L, incl. 174.6 L currently off-limit because of* Wautersia *bacteria), condensate water (0.0 L), waste/EMU dump and other (46.7 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

Conjunction: One TCA (Time of Closest Approach) is currently being assessed for another conjunction with the Cosmos satellite, Object 2421, for tomorrow, 12/10, at 6:57pm EST. Based on current tracking, NASA specialists do not recommend DAM (Debris Avoidance Maneuver) planning but believe that this recurring object requires continued monitoring.

CEO (Crew Earth Observations) photo targets uplinked for today were **East Haruj Megafans, Libya** *(nadir swath immediately left of track requested. Rivers from the Tibesti Mts--hundreds of km to the south--used to deliver sediment to the Mediterranean Sea during wetter climatic periods in the past. These sediment masses reach very large proportions [megafans], and have engulfed several rock outcrops. Images will allow comparison of Earth stream/sediment patterns with patterns of layered sediments banked against impact craters on Mars),* and **Mount Vesuvius, Italy** *(looking left for the prominent cone of Vesuvius on the plains south of Naples)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this noon, 12:24pm EST [= epoch]):
Mean altitude -- 353.7 km
Apogee height -- 358.3 km
Perigee height -- 349.0 km
Period -- 91.61 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006914
Solar Beta Angle -- -58.1 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72

Mean altitude loss in the last 24 hours -- 35 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57615.

Significant Events Ahead *(all dates Eastern Time, some changes possible!):*
12/22/08 -- Russian EVA-21 (hatch opening ~7:15pm)
02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/12/09 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
08/06/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
08/XX/09 -- Progress/MRM2 (Russian Mini Research Module, MIM2) on Soyuz
09/XX/09 -- H-IIB (JAXA HTV-1)
11/12/09 -- STS-129/Endeavour/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/08/08
Date:	Monday, December 08, 2008 2:44:26 PM
Attachments:	

ISS On-Orbit Status 12/08/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 7 of Increment 18.*

In the SM (Service Module), FE-1 Lonchakov worked his way through a 4-hr. job of installing and connecting cables for the Progress 31P-delivered new payload EXPOSE-R which he and CDR Fincke will install externally during the Russian EVA-21 on 12/22. The outfitting was supported by ground specialist tagup were required. *[EXPOSE-R comprises a suite of nine ESA astrobiology experiments with organisms to be exposed to solar UV (ultraviolet), vacuum, cosmic rays and perpetual temperature variations as the station passes through areas of direct sunlight and the cold darkness of Earth's shadow. EXPOSE-R is equipped with three trays which are loaded with a variety of biological samples including plant seeds and spores of bacteria, fungi and ferns. They will be exposed to the harsh space environment for about one and a half years. EXPOSE-R will join EXPOSE-E, a similar & complementary set of trays filled with terrestrial organisms which is already installed on the outside of the Columbus module as one of the nine payloads of the EuTEF (European Technology Exposure Facility). At the end of the exposure period, the EXPOSE-R trays will be retrieved from their location and returned to Earth with a Russian Soyuz spacecraft.]*

After deactivation/reactivation of the BITS1-12 & VD-SU control mode, required for the EXPOSE installations, the FE-1 performed the regular check on the BRI Smart Switch Router computer and its Ethernet connection to assess any impact of these activities on Ethernet comm. *[BRI is part of the RS OpsLAN (Russian Segment/ Operations Local Area Network), with connections to the three SSC clients, the Ethernet tie-in with the US network, and a network printer in the RS.]*

FE-2 Magnus collected the periodic samples from the WRS WPA (Water Recovery System/Water Processing Assembly), which then were analyzed with –

- TOCA (Total Organic Carbon Analyzer),
- WMK MCD (Water Microbiology Kit/Microbial Capture Devices) for inflight

microbial processing, and

- CDB (Coliform Detection Bag) for inflight coliform indications (Magenta for Positive, Yellow for Negative).
- In addition, the usual archival sample was stowed away for post-flight analysis on the ground.

[WRS sampling & checkouts are regularly conducted for 90 days: every 4 days – WRS water hose (TOCA inflight analysis) & microbial bag sample (inflight bacterial visual enumeration plus archival for return on 15A), every 8 days – an archival water sample (return on 15A), and monthly – a TOCA bag sample from PWD (tested inflight). Coliform bacteria are the commonly-used bacterial indicator of sanitary quality of foods and water. They are defined as rod-shaped Gram-negative non-spore forming organisms that ferment Lactose with the production of acid and gas when incubated at 35-37 degC. Coliforms are abundant in the feces of warm-blooded animals, but can also be found in the aquatic environment, in soil and on vegetation. In most instances, coliforms themselves are not the cause of sickness, but they are easy to culture and their presence is used to indicate that other pathogenic organisms of fecal origin may be present.]

Sandy also conducted the periodic deployment of four passive FMK (Formaldehyde Monitoring Kit) sampling assemblies in the Lab (at P3, below CEVIS) and SM (at the most forward handrail, on panel 307) for two days, to catch any atmospheric formaldehyde on a collector substrate for subsequent analysis on the ground. *[Two monitors each are usually attached side by side, preferably in an orientation with their faces perpendicular to the direction of air flow.]*

More work was performed by CDR Fincke on readying the WHC (Waste & Hygiene Compartment)/toilet for use, today by installing & routing the urine jumper and the flush water jumper (between the P1 & P2 positions in the US Lab). *[For mating the flush water jumper to the feed water QD (quick disconnect) on the Z-Panel, the CDR temporarily removed the interfering OGS (Oxygen Generation System) feed water QD from the OGS Z-Panel. The three jumper connections remain loose, to be fully mated during the subsequent WHC umbilical mating.]*

Fincke also conducted the regular periodic leak checks on the WRS-1 & WRS-2 racks, after temporarily powering down & disconnecting the WPA tank for the checks and instead connecting the WRS to the Lab condensate tank. Later, Mike switched the hose back from the Lab condensate tank to the WPA.

After the WRS rack rotations for the leak checking and before reconfiguring the OGS rack (see above), Mike relocated the TOCA from its temporary location on the OGS to the WRS-2 rack.

Sandra Magnus conducted the periodic PCS (Portable Computer System) laptop

battery checks and reboots on all active US PCS and on the COL PWS (Portable Work Station) laptop (once/month). *[Lab RWS laptop: 100% charged, reboot successful; Cupola RWS: off; JPM (Japanese Pressurized Module) PCS: 100% charged, reboot successful; Airlock (A/L) PCS: off; SM PCS: 97% charged, reboot successful; COL RWS: reboot successful.]*

In the Soyuz 13S spacecraft, docked at the FGB nadir port, FE-1 Lonchakov deactivated the gas analyzer, a periodic 48-hr. checkup activity.

Afterwards, with the Elektron oxygen generator turned off, Yuri installed a new EMI (Electro-Magnetic Interference) filter (FPP) on the Elektron's ST-64 current stabilizer. *[The electronic filter is designed to protect visiting vehicles, such as the HTV (H-II Transfer Vehicle), from RF/EMI.]*

Fincke performed the third ICEPAC insertion into the MELFI after ULF-2, today retrieving two -32 degC ICEPAC belts and placing them into Dewar 1, Tray D/ Section 1 & 2.

In preparation for upcoming CHeCS (Crew Health Care Systems) Rack 1 installation work, Magnus swapped TCS (Thermal Control System) jumpers, demating a supply line at the Lab1S4 Z-Panel, then quickly connecting an MTL (Moderate Temperature Loop) supply jumper instead, followed by repressurization and startup of the MTL by the ground, which finally switched to single LTL (Low Temperature Loop) to regain MTL cooling. *[MTL depress & shutdown was done because of a LAB1S4 supply line QD known to leak when demated.]*

In JAXA's Kibo JPM, the FE-2 supported SSIPC (Space Station Integration & Promotion Center)/Tsukuba activities by activating the MMA (Microgravity Measurement Apparatus) and its laptop (MLT), first powering up the MMA's NCU/ RSU (Network Control Unit/Remote Sensor Unit) set from the Ryutai rack's UDC (Utility DC-to-DC Converter), then turning on both NCU/RSU and MLT. *[All payload activities except UDS/MMA on/off can be performed remotely by the ground.]*

Working on the MATRYOSHKA-R (RBO-3-2) radiation instrumentation in the SM (panel 326), Lonchakov turned off the AST Spectrometer, taking radiation measurements, then removed the PCMCIA (Portable Computer Memory Card International Adapter) ALC-956 memory card and checked number and size of its data files. Card 956 was then stowed in a kit, with the AST Spectrometer remaining deactivated. The activity and hardware was photo documented, with the images processed for downlink via OCA.

Yuri completed the routine daily servicing of the SM's SOZh system (Environment

Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

Sandy Magnus performed the regular daily IMS (Inventory Management System) maintenance task by updating/editing the IMS standard “delta file” including stowage locations for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The FE-2 also conducted a run with the MedOps experiment WinSCAT (Spaceflight Cognitive Assessment Tool for Windows), her first onboard session, by logging in on the MEC (Medical Equipment Computer) laptop and performing the psychological evaluation exercise on the laptop-based WinSCAT application. *[WinSCAT is a monthly time-constrained questionnaire test of cognitive abilities, routinely performed by astronauts aboard the ISS every 30 days before or after the PHS (periodic health status) test or on special CDR's, crewmembers or flight surgeons request. The test uses cognitive subtests that measure sustained concentration, verbal working memory, attention, short-term memory, spatial processing, and math skills. The five cognitive subtests are Coding Memory - Learning, Continuous Processing Task (CPT), Match to Sample, Mathematics, and Coding Delayed Recall. These WinSCAT subtests are the same as those used during NASA’s long-duration bed rest studies.]*

Sandy again had an hour to herself for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residence, if she/he chooses to take it.

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

At ~10:15am EST, FE-2 Magnus held a 20-min. teleconference with ground specialists to discuss ULF-2 transfer issues.

At ~11:30am, Sandy conducted a 15-min. CDD (Crew Discretionary Conference).

At ~11:50am, Magnus powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, & power supply) and conducted, at 11:55am, a ham radio session with Ellis School, Belleville, Illinois. *[Ellis School is located 15 min. from St. Louis and serves approximately 400*

students ranging from kindergarten through fourth grade. Ellis school has been named a No Child Left Behind-Blue Ribbon winner for 2008. Only 21 schools in Illinois received this honor and Ellis School was the only school in Southern Illinois to be named a Blue Ribbon School. Nationwide, 329 schools were selected as Blue Ribbons Schools. The students that talked to Sandy on board the ISS were 16 third graders that have been studying about the shuttle, ISS and the planets during this year at school. The questions that they asked were developed by themselves over the past few weeks. Questions to Sandy were uplinked beforehand. "Is it fun to float in the ISS, what do you like to do best when you are floating?"; "How can you tell if it is day or night in space when you are inside the ISS?"; "How do you move the robotic arm?"; "Is there a limit of how many days a person can live on the ISS and stay in space?"; "Since you are going to be on the ISS for Christmas, how are you going to get your presents?"; "Do you watch TV or movies in the ISS and if so, which ones?"; "How did it feel when you took off on Endeavour, was it scary?"; "What was the first thing you did when you got into space?"; "How long does it take to get from Earth to the ISS?"; "How funny do you think a bird would look if it was flying inside the ISS-would it fly like a bird on Earth?".]

Working off his discretionary job list, the FE-1 conducted the frequent status check on the Russian BIO-5 Rasteniya-1 ("Plants-1") experiment, verifying proper operation of the BU Control Unit and MIS-LADA Module fans (testing their air flow by hand). *[Rasteniya-1 researches growth and development of plants under spaceflight conditions in the LADA-14 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). The payload hardware includes a module (MIS/ Module for the Investigation of Substrates), the MIS control unit (BU), a nitrogen purge unit (BPA) and other accessories. During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. LADA consists of a wall-mounted growth chamber that provides long-term, ready access for crewmember interaction. It provides light and root zone control but relies on the cabin environmental control systems for humidity, gas composition, and temperature control. Cabin air is pulled into the leaf chamber, flows over the plants and vents through the light bank to provide both plant gas exchange and light bank cooling.]*

No CEO (Crew Earth Observation) photo targets uplinked today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

I**SS Orbit** (as of this morning, 11:59am EST [= epoch]):

Mean altitude -- 353.7 km
Apogee height -- 358.3 km
Perigee height -- 349.1 km
Period -- 91.61 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006778
Solar Beta Angle -- -53.4 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 170 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57599.

Significant Events Ahead *(all dates Eastern Time, some changes possible!):*
12/07/08 -- Progress M-65/30P reentry (after 3 weeks autonomous flight for geophysical experiments)
12/22/08 -- Russian EVA-21 (hatch opening ~7:15pm)
02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/12/09 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
08/06/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
08/XX/09 -- Progress/MRM2 (Russian Mini Research Module, MIM2) on Soyuz
09/XX/09 -- H-IIB (JAXA HTV-1)
11/12/09 -- STS-129/Endeavour/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/07/08
Date:	Sunday, December 07, 2008 2:27:03 PM
Attachments:	

ISS On-Orbit Status 12/07/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – off-duty day for CDR Fincke, FE-1 Lonchakov & FE-2 Magnus. Ahead: Week 7 of Increment 18.*

FE-1 Lonchakov performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. Additionally, the FE-1 today checked up on the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem, gathering weekly data on total operating time & "On" durations for reporting to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

CDR Fincke serviced the US WRS (Water Recovery System) by refilling the WSTA (Water Storage Tank Assembly) with pretreated urine from EDV-U container for processing by the UPA (Urine Processing Assembly). *[The WSTA should be filled to no more than 60%. Besides the regular refilling for processing, WRS sampling & checkouts are being conducted for 90 days: every 4 days – WRS water hose (TOCA inflight analysis) & microbial bag sample (inflight bacterial visual enumeration plus archival for return on 15A), every 8 days – an archival water sample (return on 15A), and monthly – a TOCA bag sample from PWD (tested inflight).]*

Lonchakov had ~40 min to downlink five TV PAO messages of greetings for various upcoming anniversaries and holidays: (1) to the workers of the S.P. Korolev Experimental Machine-Building Plant on the plant's 90th anniversary; (2) to personnel of the Reutov City Garrison Military Court on its 40th anniversary; (3) to the Military Counterintelligence Department of the Petrograd-Leningrad

Military District on their 90th anniversary; (4) to the FSB Academy Science & Education Department on Russia's National Security Service Personnel Day; and (5) to the personnel of the Criminal Investigation Bureau #8 of the Russian Ministry of Interior.

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

The CDR & FE-2 had their weekly PFCs (Private Family Conferences) via S-band/ audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Mike at ~2:50pm, Sandra at ~3:35pm EST.

Working off the Russian discretionary "if time permits" task list, Lonchakov performed a session of the DZZ-2 "Diatomeya" ocean observations program, using the NIKON-F5 DCS still camera and the HDV (high-definition) video camcorder from SM window 8 for ~20 min for digital photo/video documentation of Pacific Ocean and North Atlantic color contrast formations and cloud cover along the flight path. *[Target zones in the Pacific Ocean and North Atlantic were from the west of Chile to the west of Ireland, and from the east of New Zealand to offshore Mexico.]*

Also off the work suggestions list, Yuri conducted another session for Russia's Environmental Safety Agency (EKON), making observations and taking KPT-3 aerial photography of environmental conditions on earth using the Nikon D2X with the SIGMA 300-800mm telephoto lens.

As a third item on the discretionary job list, the FE-1 conducted the frequent status check on the Russian BIO-5 Rasteniya-1 ("Plants-1") experiment, verifying proper operation of the BU Control Unit and MIS-LADA Module fans (testing their air flow by hand). *[Rasteniya-1 researches growth and development of plants under spaceflight conditions in the LADA-14 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). The payload hardware includes a module (MIS/ Module for the Investigation of Substrates), the MIS control unit (BU), a nitrogen purge unit (BPA) and other accessories. During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. LADA consists of a wall-mounted growth chamber that provides long-term, ready access for crewmember interaction. It provides light and root zone control but relies on the cabin environmental control systems for humidity, gas composition, and temperature control. Cabin air is pulled into the leaf chamber, flows over the plants and vents through the light bank to provide both plant gas exchange and light bank cooling.]*

VolSci Kudos: Mike & Sandy received special kudos from ground teams for the great jobs with their selected Voluntary Weekend Science activities on their off-duty day, yesterday, Fincke for his preparations of the FCF CIR (Fluids & Combustions Facility/Combustion Integrated Rack) outfitting, Magnus for the JAXA Marangoni Clean Up (Part 1 of 2), very important for the next Marangoni Experiment Series. *Arigato Gozaimasu!*

No CEO (Crew Earth Observation) photo targets uplinked today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

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Mean altitude loss in the last 24 hours -- 64 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57579.

Significant Events Ahead *(all dates Eastern Time, some changes possible!):*
12/07/08 -- Progress M-65/30P reentry (after 3 weeks autonomous flight for geophysical experiments)
12/22/08 -- Russian EVA-21 (hatch opening ~7:15pm)
02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/12/09 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD

05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
08/06/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
08/XX/09 -- Progress/MRM2 (Russian Mini Research Module, MIM2) on Soyuz
09/XX/09 -- H-IIB (JAXA HTV-1)
11/12/09 -- STS-129/Endeavour/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/06/08
Date:	Saturday, December 06, 2008 9:58:23 AM
Attachments:	

ISS On-Orbit Status 12/06/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – off-duty day for CDR Fincke, FE-1 Lonchakov & FE-2 Magnus.*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the SM (Service Module) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

As part of the house cleaning, Yuri Lonchakov conducted regular maintenance inspection & cleaning of fan screens in the FGB (TsV2), DC-1 (V3) and SM (VPkhO, VPrK, FS5, FS6 & FS9).

For her VolSci (Voluntary Weekend Science) Program today, FE-2 Magnus had selected Part 1 of a major clean-up job of the JAXA Marangoni experiment in the Kibo JPM (Japanese Pressurized Module), estimated at ~3.5 hrs. The task required the MWA (Maintenance Work Area) and a downlink from the JPM internal camera to SSIPC (Space Station Integrated Promotion Center) in Tsukuba for ground support of the crew activity. *[Work objective was to clean up spilled silicone oil inside the Marangoni Experiment Cell (MS) to prevent the Core from being further contaminated and to protect the hardware for the next Marangoni Experiment #2 on Increment 19. Part 1 today involved removing the MS from the FPEF (Fluid Physics Experiment Facility) and disassembling the Experiment Core from the MS. The actual silicone oil clean up in the Core will be performed in Part 2 at a later date.]*

For his VolSci part, Mike Fincke prepared the MDCA CIA (Multi-user Droplet Combustion Apparatus/Chamber Insert Assembly) for initial installation. *[The*

MDCA is a multi-user facility designed to accommodate different droplet combustion science experiments, using the CIR (Combustion Integrated Rack) of the NASA Glenn Research Center's FCF (Fluids & Combustion Facility). The MDCA, in conjunction with the CIR, will allow for cost effective extended access to the microgravity environment, not possible on previous space flights. The MDCA contains the hardware and software required to conduct unique droplet combustion experiments in space. It consists of a CIA, an Avionics Package, and a multiple array of diagnostics.]

At ~9:00am EST the crewmembers conducted their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-Houston and TsUP-Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

CDR Fincke serviced the new WRS (Water Recovery System) by refilling the WSTA (Water Storage Tank Assembly) with pretreated urine from EDV-U container for processing. *[The WSTA should be filled to no more than 60%.]*

Sandy filled out the regular FFQ (Food Frequency Questionnaire), her second, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

In the US Lab, Mike de-installed the UOP DCP (Utility Outlet Panel/Display & Control Panel) bypass power cable to the VTR (Video Tape Recorder) at the Lab & Cupola RWS (Robotics Work Stations), now no longer required for a while.

At ~6:00am EST, Yuri Lonchakov downlinked a New Year's video message of greetings to TsUP/Moscow via MCC-Houston (Ku- & S-band).

The FE-1 completed the routine daily servicing of the SM's SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

The ISS crew completed their physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (FE-1).

Weekly Science Update *(Expedition Eighteen -- Week 6)*

3-D SPACE: PCMCIA card with results from session of Greg Chamitoff were downloaded on ULF-2.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Complete.

ANITA (Analyzing Interferometer for Ambient Air): Complete. Hardware returned on ULF-2.

BCAT-3/4 (Binary Colloidal Alloy Test 3/4): Looking forward to a possible Voluntary Science run in NODE-2 on 12/13-14.

BIO-4: ROALD samples returned on ULF-2.

BIOLAB: The activity to remove a stuck triple contained syringe on 12/2 was not successful. The crew reported that the syringe is moveable, but the piston is still held by the inner gripper inner gripper mechanism of the Handling Mechanism arm, although the TM shows it to be released. The activity was aborted.

CARDIOCOG-2: Complete.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): In progress.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-3/CGBA-5 (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus 5): “Thank you for exposing the Nectar which will provide food for the butterflies once they emerge. From video and images captured this week it appears the caterpillars are having difficultly pupating, but it is unclear whether this is due to the micro-g environment. The possibilities of a butterfly emerging from a chrysalis are decreasing with time, but all hope is not lost. The spiders remain well-fed and active in micro-g. All previously planned data on the spiders have been

collected and are being analyzed. Because the spiders are doing well, data will continue to be collected for further analysis. The spider and caterpillar data are generating positive feedback from teachers whose students are enthusiastically engaged in tracking the progress of the CSI-3 experiment."

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

EDR (European Drawer Rack): A software upgrade activity for Laptop and RIC was successfully performed on 12/3 with the support of the crew. This upgrade is required to prepare for the Protein Crystallization Diagnostic Facility (PCDF) experiment during the 15A Stage. Subsequently also PCDF-EU check-out was completed and images were received on the ground.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): The Data Handling Processing Unit (DHPU) MIL-BUS error has occurred again on 11/30. Similar MIL Bus errors have occurred on 11/5, 11/15, 11/17 and 11/20. Ground teams are investigating what causes this increased frequency of failures.-- DEBIE-2: 24-hrs science scripts executed from 11/29 to 12/2;-- DOSTEL: On-going science acquisition - nominal;-- EuTEMP: Currently inactive as planned;-- EVC: troubleshooting was planned on 12/3-4, awaiting results;-- EXPOSE: On-going science acquisition - nominal;-- FIPEX: New EOP started on 12/3;-- MEDET: On-going science acquisition - nominal; -- PLEGPAY: Inactive, "Experiment 1" memory has been erased on 10/30. Plasma generation capability has been disabled;-- TRIBOLAB: Anomaly with the TRIBOLAB Ball Bearing experiment shaft motor, currently being analyzed, unfortunately does not look good. It looks like Ball Bearing motor shaft is severely damaged.

FSL (Fluid Science Laboratory): FSL is nominal.

GEOFLOW: MMA (Microgravity Measurement Apparatus) measurements during ULF-2 undocking could not be recorded due to issue with ground commanding/ display. The issue was resolved and MMA measurements could be collected during 31P docking. Ground infrastructure at MARS USOC will be upgraded to support

GEOFLOW science acquisition as of week#7.

HDTV System Test DL (JAXA): Complete.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

ICE CRYSTAL (JAXA): Since it started on 12/1, the experiment has been running successfully. After the super cooling temperature was changed, we are now observing the crystallization of Ice during night time on ISS.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): "Thanks for operating Lab-on-a-Chip for Voluntary Science. We got good feedback from your comments and video. Your dispensing technique was great; I liked the way you held the Reader with your left hand to steady yourself. The data was also pretty interesting. The most interesting number out of the five that appeared on the display is the first one, called "Sample ng/mL". It tells you how much 'fungi' you have in your sample, and ranges between 1-100 ng/mL. The readings you obtained from the ATU (23.8 ng/mL) and Biolab glove box (<1.26ng/mL), were similar to those obtained by Greg in the US Lab and Node 1 (between 1 and 18 ng/mL). Trace levels of fungi such as these are common on all surfaces and are of no real concern. Readings above 75 ng/mL are potential indications of more established fungal growth."

Marangoni Experiment for ISS in JAXA FPEF (Fluid Physics Experiment Facility): In progress.

Micro-G Clay (JAXA EPO): Complete.

MISSE (Materials ISS Experiment): Ongoing.

Moon Photography from ISS (JAXA EPO): Complete.

MOP (Motion Perception in Zero-G): Three ULF-2 astronauts have participated in this experiment (daily questionnaires)

MSG-SAME (Microgravity Science Glovebox): Complete.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MUSCLE-G (LBP/Low Back Pain): Six ULF- astronauts have participating in this experiment (daily questionnaires)

NOA-1/-2 (Nitric Oxide Analyzer, ESA): Complete.

NUTRITION w/REPOSITORY: In progress.

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PCRF (Protein Crystallization Research Facility) Reconfiguration (JAXA): Complete.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): SHERE is standing by and ready for any science operations in the MSG during the month of December.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): In progress.

SOLAR (Solar Monitoring Observatory): The Sun visibility window started on 11/21 and ended in the night from 12/1 to 2. After a last sun tracking of 4.5 min which started around GMT336/22:50, SOLAR was put in idle mode on 337/00:34. A software patch was successfully uploaded on 11/20 and SOLAR is now running version 4.7 and is in Pointing Mode. The new SOLAR software release is currently loaded on the RAM memory, and it will be transferred to the SOLAR Flash Disk on 12/5. In the night of 12/2-3, SOLAR experienced a loss of ancillary data. The issue is under investigation to avoid impact during next Sun visibility window.-- SOVIM: No science acquisition, non-nominal mode: Trouble-shooting activities were not successful. Unfortunately results look not good for instrument. - SOLSPEC: science acquisition until 12/1-2, out of sun visibility since;-- SOLACES: science

acquisition until 12/1-2, out of sun visibility since.

SOLO (Sodium Loading in Microgravity): Blood and urine samples from Greg Chamitoff were returned with ULF-2.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): Reserve.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): The 4 remaining EC's (Experiment Containers) were returned with ULF-2, although it is not foreseen to analyze them for scientific purpose.

CEO (Crew Earth Observations): "For this past week the crew captured some good quality imagery, with regard to sharpness and content. We note in particular detailed images of the pyramids and urban scenes nearby, complex landscapes of megafan plains in Argentina (Bermejo R.), several Andes lakes and a 800 mm view of the Mt Nemut Caldera, Turkey near L. Van. The image chosen for this week's Earth Observatory website submission is a detailed 800mm shot of Deriba Caldera in western Sudan, with a central Asian dust storm for next week."

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

Significant Events Ahead *(all dates Eastern Time, some changes possible!):*
12/07/08 -- Progress M-65/30P reentry (after 3 weeks autonomous flight for geophysical experiments)
12/22/08 -- Russian EVA-21 (hatch opening ~7:15pm)
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02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
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03/27/09 -- Soyuz TMA-14/18S docking (DC1)

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04/07/09 -- Progress 32P undocking & deorbit
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05/27/09 -- Soyuz TMA-15/19S launch

Six-person crew on ISS

08/06/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
08/XX/09 -- Progress/MRM2 (Russian Mini Research Module, MIM2) on Soyuz
09/XX/09 -- H-IIB (JAXA HTV-1)
11/12/09 -- STS-129/Endeavour/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/05/08
Date:	Friday, December 05, 2008 1:21:22 PM
Attachments:	

ISS On-Orbit Status 12/05/08

All ISS systems continue to function nominally, except those noted previously or below.

FE-2 Magnus worked in the JAXA JPM (Japanese Pressurized Module) –

- First powering down the HTV PROX (H-II Transfer Vehicle proximity operations) Rack after its successful checkout runs by herself & the ground,
- Cleaning up the HCP (Hardware Command Panel) by removing and stowing the HCP from Node-2 and the US Lab with its cables, then
- Activating the JEMRMS (JEM Robotic Manipulator System) with its two monitors, CCP (Camera Control Panel) and EXT2 power outlet for the subsequent maneuvering of the MA (Main Arm) into position for viewing the relocation of the ESP-3 (External Stowage Platform 3) with the SSRMS (Space Station Remote Manipulator System), and finally
- Deactivating the UDC (Utility DC/DC Converter) and MMA (Microgravity Measurement Apparatus) components at the Ryutai Rack.

Later, after the ESP-3 relocation, Magnus reconfigured the JEMRMS PTU ELBOW (Pan & Tilt Unit/Elbow camera) in stowed position & deactivated it, along with its EXT2-powered JMUs (Joint Motor Units) motors, CCP and monitors 1,2.

After turning on the CUPola PCS (Portable Computer System) laptop in the Lab for today's activities, CDR Fincke started the DOUG (Dynamic Onboard Ubiquitous Graphics) application to support the ESP-3 relocation. *[DOUG is a special application running on the MSS (Mobile Service System) RWS (Robotics Workstation) laptops that provides a graphical birdseye-view image of the external station configuration and the SSRMS arm, showing its real-time location and configuration on a laptop during its operation.]*

Fincke & Magnus then worked with the SSRMS through the steps necessary for ESP-3 relocation:

- Unlatching the MCAS (Mobile Base System [MBS] Common Attachment

System),
- Demating the ESP-3 and moving it to its regular location on the P3 truss zenith UCCAS (Unpressurized Cargo Carrier Attachment System),
- Obtaining First Stage Capture after positive RTL (Ready to Latch) indications,
- Limping the robotarm (brakes off),
- Completing Second Stage UCCAS Capture, then applying brakes and
- Ungrappling the ESP-3.

Finally, the SSRMS was “walked” to the MBS PDGF-3 (Power & Data Grapple Fixture 3) for ”parking”, releasing the MBS PDGF-4 with its other LEE (Latching End Effector).

FE-1 Lonchakov set up the hardware for the Russian MBI-21 PNEVMOKARD experiment and conducted the session, his second, which forbids moving or talking during data recording. The experiment is controlled from the RSE-med A31p laptop, equipped with new software, and uses the TENZOPLUS sphygmomanometer to measure arterial blood pressure. Obtained test data were then downlinked via OCA. *[PNEVMOKARD (Pneumocard) attempts to obtain new scientific information to refine the understanding about the mechanisms used by the cardiorespiratory system and the whole body organism to spaceflight conditions. By recording (on PCMCIA cards) the crewmember’s electrocardiogram, impedance cardiogram, low-frequency phonocardiogram (seismocardiogram), pneumotachogram (using nose temperature sensors), and finger photoplethismogram, the experiment supports integrated studies of (1) the cardiovascular system and its adaptation mechanisms in various phases of a long-duration mission, (2) the synchronization of heart activity and breathing factors, as well as the cardiorespiratory system control processes based on the variability rate of physiological parameters, and (3) the interconnection between the cardiorespiratory system during a long-duration mission and the tolerance of orthostatic & physical activities at the beginning of readaptation for predicting possible reactions of the crewmembers organism during the their return to ground.]*

Following up on her earlier biochemical sample analyses, Sandy Magnus retrieved the Coliform water samples obtained and processed on 11/26 from the WPA (Water Processing Assembly) and PWD (Potable Water Dispenser) from their temporary incubation bag and inspected them for coliform indications (Magenta for Positive, Yellow for Negative). *[Coliform bacteria are the commonly-used bacterial indicator of sanitary quality of foods and water. They are defined as rod-shaped Gram-negative non-spore forming organisms that ferment Lactose with the production of acid and gas when incubated at 35-37 degC. Coliforms are abundant in the feces of warm-blooded animals, but can also be found in the aquatic environment, in soil and on vegetation. In most instances, coliforms themselves are*

not the cause of sickness, but they are easy to culture and their presence is used to indicate that other pathogenic organisms of fecal origin may be present.]

Mike Fincke serviced the new WRS (Water Recovery System) by performing the regular leak checks on the WRS-1 & WRS-2 racks and later refilling the WSTA (Water Storage Tank Assembly) with pretreated urine from EDV-U container for processing. *[WRS sampling & checkouts are being conducted for 90 days: every 4 days – WRS water hose (TOCA inflight analysis) & microbial bag sample (inflight bacterial visual enumeration plus archival for return on 15A), every 8 days – an archival water sample (return on 15A), and monthly – a TOCA bag sample from PWD (tested inflight).]*

In the Soyuz 13S spacecraft, docked at the FGB nadir port, FE-1 Lonchakov turned on the gas analyzer, a periodic 48-hr. checkup activity.

In the Service Module (SM), Yuri also performed major maintenance/service on the SRV-K2M condensate water recovery system by –

- Replacing its end-of-life filter reactor (F-R),
- Inspecting & cleaning the sediment trap pipe filter insert and
- Replacing the BRPK-1 Condensate Separation & Pumping Unit 1.

Afterwards, the temporarily disconnected BITS2-12 Onboard Telemetry Measurement System was hooked up again.

As a relatively new regular activity after deactivation/reactivation of the BITS1-12 and VD-SU control mode, the FE-1 then checked the BRI Smart Switch Router computer and its new Ethernet connection to assess any impact of these activities on Ethernet comm, followed by dumping BRI log files from the RSS1 laptop for downlinking to the ground. *[BRI is part of the RS OpsLAN (Russian Segment/ Operations Local Area Network), with connections to the three SSC clients, the Ethernet tie-in with the US network, and a network printer in the RS.]*

Sandy Magnus again had an hour to herself for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residence, if she/he chooses to take it.

The FE-1 spent another ~1:20h on Progress 31P unloading, keeping track of moves & locations in the IMS (Inventory Management System) and guided by an uplinked transfer list. *[Equipment delivered by the cargo ship include food containers, a new BKO multifiltration unit, five fresh BK-3M oxygen bottles for Orlan-M EVAs, a MNR separator pump, a new AK-1M air sampler kit, personal oral hygiene articles (SLG), a BPK condensate feed unit & its control panel, a Penguin-3 suit, an electrical stimulation suit, ASU toilet inserts, etc.]*

Working from his discretionary (as time permits" task list, the FE-1 completed the routine daily servicing of the SM's SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

Also from the suggested jobs list, Yuri performed the regular daily IMS maintenance task by updating/editing the IMS standard "delta file" including stowage locations for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

A third task for Lonchakov's choice was the regular status check on the Russian BIO-5 Rasteniya-1 ("Plants-1") experiment. *[Rasteniya-1 researches growth and development of plants under spaceflight conditions in the LADA-14 "greenhouse" from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). The payload hardware includes a module (MIS/Module for the Investigation of Substrates), a MIS control unit (BU), a nitrogen purge unit (BPA) and other accessories. During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording.]*

CDR Fincke's first run with the MedOps experiment WinSCAT (Spaceflight Cognitive Assessment Tool for Windows), originally hard-scheduled for today, remains on his discretionary "job jar" task list. *[WinSCAT is a monthly laptop-based time-constrained questionnaire test of cognitive abilities, routinely performed by astronauts aboard the ISS every 30 days before or after the PHS (periodic health status) test or on special CDR's, crewmembers or flight surgeons request. The test uses cognitive subtests that measure sustained concentration, verbal working memory, attention, short-term memory, spatial processing, and math skills. The five cognitive subtests are Coding Memory - Learning, Continuous Processing Task (CPT), Match to Sample, Mathematics, and Coding Delayed Recall. These WinSCAT subtests are the same as those used during NASA's long-duration bed rest studies.]*

At ~3:15am EST, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~4:25am, Yuri conducted a PAO TV conference exchange with children of the Togliatti School for the on-air premiere of a social and education project "Adult Talk.

How to Become Successful?" launched by the Togliatti TV channel and sponsored by Togliatti Mayor's Office Department of Education in mid-December. *[Togliatti (or Tolyatti) is a city in Samara Oblast (formerly Kuybyshev. The city was named after Palmiro Togliatti, the longest-serving secretary of the Italian Communist Party. The show will have one rule: an adult must provide a candid answer to each question asked by a child. One may only refuse to answer a very personal question. Some questions of the school children to Yuri were: "Do land and water have the same color in various parts of the Earth globe?"; "Does space have day and night?"; "Is it true that the Earth has a shape of a globe? Or is it oblate?"; "Everybody talks about bad state of environment. Can you see from space that it is really gotten worse?"; "To fly to space (not as a tourist, but as a cosmonaut) does one have to be, for example, a biologist or zoologist? In other words, an expert in some field? To what institution of higher learning one should go to study to become a cosmonaut?"; "What does a cosmonaut do on the ground, when he is not in space? How does he support his family? Or should every cosmonaut also have an Earthly profession?"; "People of what professions are needed in space?"; "What is a definition of success for a cosmonaut? Whether you did or did not fly to space? What if you did not make it?"; "Do you have a pet at home? If yes, then who takes care of it when you are away?"; "Can you tell us when you are going to fly over Togliatti so we could see you and wave at you?"]*

At ~8:10am, Yuri & Mike linked up with TsUP stowage specialists via S-band to conduct the weekly IMS tagup, discussing inventory & stowage issues, equipment locations and cargo transfers.

At ~2:45pm, the ISS crew will have their regular weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC (Station Support Computer)]*.

The ISS crew completed their physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (FE-1).

CEO (Crew Earth Observations) photo targets uplinked for today were Southwest Algeria Megafans *(nadir and near-nadir mapping swaths just right of track were requested for ~60 secs. Weather should have been clear over this repeat Saharan site. Two megafans, different in color, occupy the foot of low mountains. Their formative streams are only active during very occasional heavy storms [perhaps once per decade or longer]. The fans were laid down during prior humid climates, the last humid period being centered ~10,000 years ago. The megafans are analogs for features on Mars. Visual cues are major linear dunes located just left of track, and contorted rocks immediately beyond the target),* Central Algeria

Megafans *(northeast of the target above lies a complex of smaller fans, all right of track. Detailed images of these features were requested. Visual cues are linear dunes left of the target [north] and the smaller Tifernine dunes just beyond [southeast]),* and Mississippi Delta Region *(weather was predicted clear over the delta. Nadir pass to document coastal wetland recovery)*.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 5:55am EST [= epoch]):
Mean altitude -- 353.9 km
Apogee height -- 358.3 km
Perigee height -- 349.5 km
Period -- 91.62 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006484
Solar Beta Angle -- -38.8 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 50 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57547.

Significant Events Ahead *(all dates Eastern Time, some changes possible!):*
12/07/08 -- Progress M-65/30P reentry (after 3 weeks autonomous flight for geophysical experiments)
12/22/08 -- Russian EVA-21 (hatch opening ~7:15pm)
02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/12/09 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
08/06/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
08/XX/09 -- Progress/MRM2 (Mini Research Module, MIM2) on Soyuz

09/XX/09 -- H-IIB (HTV-1)
11/12/09 -- STS-129/Endeavour/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/04/08
Date:	Thursday, December 04, 2008 3:03:36 PM
Attachments:	

ISS On-Orbit Status 12/04/08

All ISS systems continue to function nominally, except those noted previously or below. *>>>Today is the Columbus laboratory's 300th day in orbit.<<<*

At ~4:00am EST, TsUP-Moscow conducted the standard dynamic firing tests with the newly arrived Progress M-01M/31P, for which FE-2 Magnus (at ~2:55am) closed the protective science windows shutters in the JAXA JPM (Japanese Pressurized Module) and US Lab. Electrical integration of 31P systems into the ISS RS (Russian Segment) was successfully tested yesterday. *[The tests, which also checked ISS roll control (31P being radially docked at the DC1 Docking Compartment), were successful. For the firings, ISS attitude control authority was handed over to RS MCS (Russian Segment Motion Control System) at 3:40am and returned to US CMG (Control Moment Gyroscope) Momentum Management at 5:48am. The DPO-B (Approach & Attitude Control) thruster tests, intended to check 31P's full integration into the ISS steering logic and ensure thruster functionality on both manifolds in providing attitude control, reboosts and DAMs (debris avoidance maneuvers), did not require any powerdowns. They are also used to determine which thruster manifold, of two jets each, will be considered the primary one for rebooss and DAMs. Later, Lab & JPM science window shutters were opened again.]*

Afterwards, FE-2 Magnus powered down and stowed the IWIS (Internal Wireless Instrumentation System) sensors which were used to take structural dynamics measurements during the thruster firings.

In the SM (Service Module), FE-1 Lonchakov continued the outfitting & setting up of SUBA/Onboard Equipment Control System and SBI/Onboard Data Measuring & Storage System instruments with the new BSK-5V/Power Switch Assembly 5V (Blok cilovoiy kommutatsii-5V) for the upcoming Russian experiment IMPULSE, delivered on 31P. CDR Fincke assisted later with the mating of the instrument components to the BITS2-12/Onboard Telemetry Measurement System.
[IMPULSE, along with the new experiment OBSTANOVKA (Environment), will be

using ionosphere probes and a pulsed plasma source for making scientific measurements of ionosphere parameters and plasma-wave characteristics.]

As a relatively new regular activity after deactivation/reactivation of the BITS1-12 and VD-SU control mode, Yuri then checked the BRI Smart Switch Router computer and its new Ethernet connection to assess any impact of these activities on Ethernet comm. *[BRI is part of the RS OpsLAN (Operations Local Area Network), with connections to the three SSC clients, the Ethernet tie-in with the US network, and a network printer in the RS.]*

CDR Fincke continued his work on the WRS (Water Recovery System), connecting the UPA (Urine Processing Assembly) Compressor-M's power cable to the EXPRESS Rack and starting the filling of the WSTA (Water Storage Tank Assembly) with pretreated urine from EDV-U container for processing.

Sandra Magnus set up the camcorder equipment for taking video of herself performing her first session of the general U.S. MedOps PFE (Periodic Fitness Evaluation) program on the CEVIS (Cycle Ergometer with Vibration Isolation), filmed via VTR (Video Tape Recorder) by Mike Fincke who assisted as CMO (Crew Medical Officer). *[The footage was downlinked afterwards for biomechanical evaluation of the exercising crewmember and assessment of the on-orbit setup of equipment during data collection and hardware status.]*

In preparation for tomorrow's scheduled ESP-3 (External Stowage Platform 3) relocation from the MCAS (Mobile Base System [MBS] Common Attachment System) to the zenith side of the P3 truss element UCCAS (Unpressurized Cargo Carriers Attachment System), Mike Fincke & Sandy Magnus conducted the usual one-hour review of DOUG (Dynamic Onboard Ubiquitous Graphics) software. *[The SSRMS (Space Station Remote Manipulator System) was "walked" yesterday by ground commanding to the MBS PDGF-4 (Power & Data Grapple Fixture 4), then released its other end at the Node-2 PDGF and maneuvered into position for today's MT (Mobile Transporter) translation to WS-7 (Worksite 7), performed by ground control at 11:40am-1:10pm. Tomorrow, Mike & Sandy will relocate the ESP-3 (External Stowage Platform 3) from the MBS MCAS to its permanent place on the P3 truss.]*

The FE-2 received great kudos from the HTV (H-II Transfer Vehicle) team at the SSIPC (Space Station Integration & Promotion Center) at Tsukuba/Japan for completing all planned PROX HCP (Hardware Command Panel) functional checks yesterday, in one day.

In the US A/L (Airlock), the CDR set up EMUs (Extravehicular Mobility Units) #3004 & #3005 with their SCUs (Service & Cooling Umbilicals) and initiated the standard

one-hour scrubbing process on the spacesuits' cooling water loops, filtering ionic and particulate matter (via a 3-micron filter), then reconfigured the cooling loops and started the ~2hr biocide filtering. Scrubbing termination, disassembly of the EMU water processing kit and stowing the equipment followed. *[Loop scrubbing, incl. iodination of the LCVGs (Liquid Cooling & Ventilation Garments) for biocidal maintenance, is done to eliminate any biomass and particulate matter that may have accumulated in the loops.]*

Magnus completed the weekly 10-min. CWC (Contingency Water Container) inventory as part of on-going WRM (Water Recovery & Management) assessment of onboard water supplies. Updated "cue cards" based on the crew's water calldowns are sent up every other week. *[The new card (18-0006F) lists 38 CWCs (1,302.2 L total) for the four types of water identified on board: technical water (688.9 L, for Elektron electrolysis), potable water (530.4 L, incl. 174.6 L currently off-limit because of* Wautersia *bacteria), condensate water (36.2 L), waste/ EMU dump and other (46.7 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

CDR Fincke's first run with the MedOps experiment WinSCAT (Spaceflight Cognitive Assessment Tool for Windows), originally hard-scheduled for today, was moved to Mike's discretionary "job jar" task list. *[WinSCAT is a monthly laptop-based time-constrained questionnaire test of cognitive abilities, routinely performed by astronauts aboard the ISS every 30 days before or after the PHS (periodic health status) test or on special CDR's, crewmembers or flight surgeons request. The test uses cognitive subtests that measure sustained concentration, verbal working memory, attention, short-term memory, spatial processing, and math skills. The five cognitive subtests are Coding Memory - Learning, Continuous Processing Task (CPT), Match to Sample, Mathematics, and Coding Delayed Recall. These WinSCAT subtests are the same as those used during NASA's long-duration bed rest studies.]*

Sandy performed the periodic status check on the CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) payload, located in the ER-2 (EXPRESS Rack 2).

The FE-2 also completed the routine daily servicing of the SM's SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

Later, Sandy had an hour to herself for general orientation (station familiarization &

acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residence, if she/he chooses to take it.

The ISS crew completed their physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2/PFE), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (FE-1).

At ~1:20pm EST, CDR Fincke powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, & power supply) and conducted, at 1:25pm, a ham radio session with Quispamsis Elementary/Middle School, Quispamsis, New Brunswick, Canada. *[Sessions providing information on topics directly related to the ARISS (Amateur Radio on ISS) have been made available to the student body and staff by various mentors. Coordination with the Education Office of the Canadian Space Agency has resulted in a variety of materials being made available. Future plans with the CSA include a visit from an Agency representative to both participating Schools. On a much lighter note, a QMS dance planned for the same week as the contact will have a "space" theme. It was expected that 500 students as well as staff from both schools, parents and friends were to be in attendance during the contact. Representatives from the School District and three of Government (Municipal, Provincial and Federal) were invited. Media coverage was expected to include Regional and National outlets for radio, television and press. Questions to Mike were uplinked beforehand. "Does it take a lot of physical effort to live and work in microgravity?"; "What is the best part of your job?"; "Was there anyone or anything that inspired you to become an Astronaut?"; "Can you describe one experiment that is going on in the Space Station?"; "What does it feel like in space?"; "What do you do with any free time that you have?"; "Do you think Astronauts will go to Mars?"; "At night can you see lights on Earth?"; "What is it you hear and see during a space walk?"; "What have you found to be the most difficult task to perform in space?"; "How is Dexter performing?"]*

At ~2:15pm EST, the ISS crew held its weekly teleconference with ISS Program Management at JSC/Houston via Private S/G2, S-band/audio.

CEO (Crew Earth Observations) photo targets uplinked for today were **Lake Poopo, Bolivia** *(ISS had a nadir pass over this lake. It lies in the transitional climate between permanent Lake Titicaca to the north and the usually dry salt lakes Uyuni and Coipasa to the south. Poopo's water levels respond to El Niño events in an opposite sense to coastal Peru: they drop when El Niño events occur and slowly rise in the years between El Niños. It is time to document the status of the lake again),* **Mauna Loa Volcano, Hawaii** *(looking just right of track for this and the next target, both on the big island of the Hawaiian chain where weather was predicted*

clear. Mauna Loa is among Earth's most active volcanoes, having erupted 33 times since the first well-documented historical eruption of 1843. Its most recent eruption was in 1984. "Mauna Loa" means "Long Mountain," an appropriate name since the visible part of the volcano stretches for about 120 km from the southern tip of the island to the coastline near Hilo), and **Kilauea Volcano, Hawaii** *(looking further right, just beyond Mauna Loa. Detailed images were requested)*.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 8:37am EST [= epoch]):
Mean altitude -- 354.0 km
Apogee height -- 358.2 km
Perigee height -- 349.7 km
Period -- 91.62 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006347
Solar Beta Angle -- -33.9 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude gain in the last 24 hours – 8 m (31P thruster firings)
Revolutions since FGB/Zarya launch (Nov. 98) – 57534.

Significant Events Ahead *(all dates Eastern Time,* ***some changes possible!****):*
12/07/08 -- Progress M-65/30P reentry (after 3 weeks autonomous flight for geophysical experiments)
12/22/08 -- Russian EVA-21
02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Endeavour/ULF3 - ELC1, ELC2

12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/03/08
Date:	Wednesday, December 03, 2008 2:23:47 PM
Attachments:	

ISS On-Orbit Status 12/03/08

All ISS systems continue to function nominally, except those noted previously or below.

Before morning inspection and breakfast, FE-1 Lonchakov terminated his third experiment session for the long-term Russian sleep study MBI-12/ SONOKARD, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

For today's WRS (Water Recovery System) sample analysis, FE-2 Magnus performed the TOCA (Total Organic Carbon Analyzer) software loading with an updated release, delayed from yesterday by incorrectly configured files on the USB drive. The correct files were uplinked last night.

Subsequently, CDR Fincke and Magnus collected potable water samples from the WPA (Water Processing Assembly) and PWD (Potable Water Dispenser) via H_2O transfer common hose, which Mike then analyzed in the TOCA, with Sandy later recording the data.

Afterwards, Fincke temporarily disconnected the WPA tank and instead connected the WRS to the Lab condensate tank, in order to conduct extensive leak checks on the WRS-1 & WRS-2 racks. Later, Mike switched the hose back from the Lab condensate tank to the WPA.

As part of his regular physical fitness evaluation, FE-1 Lonchakov undertook the Russian MO-5 MedOps protocol of cardiovascular assessment during graded physical load on the VELO cycle ergometer, his first, assisted by his Fincke CMO (Crew Medical Officer). *[The assessment uses the Gamma-1 ECG equipment with biomed harness, skin electrodes and a blood pressure and rheoplethysmograph cuff wired to the cycle ergometer's instrumentation panels. Measurements were telemetered down via VHF to RGS (Russian Groundsite) during a comm window at 5:25am EST (DO1). For the graded-load exercise, the subject works the pedals after a prescribed program at load settings of 125, 150, and 175 watts for three minutes each. Data output involves a kinetocardiogram, rheoplethysmogram, rheoencephalogram and a temporal pulsogram.]*

Sandy Magnus continued the critical HCP C/O (Hardware Command Panel checkout) activity in the US Lab for the JAXA HTV (H-II Transfer Vehicle) PROX (proximity) space-to-space communication system which she ran in onboard test mode yesterday. Today the C/O was linked to with the Tanegashima ground station (GS) in Japan, with Sandy's actual HCP commands expected to be received at the GS. *[The HCP is part of the PROX system, mostly located in the ICS rack, consisting also of a PROX antenna, a PROX-GPS (Global Positioning System) antenna, and PROX comm equipment for the HTV. When the HTV approaches the ISS, the external PROX antenna, which contains GPS receivers, will initiate communications with the HTV. The ISS orbital location and speed are immediately relayed to the HTV through the PROX. At the same time, data from the HTV are relayed to the ISS. In addition, the antenna relays commands sent from the ground to the HTV.]*

For the upcoming Russian experiment IMPULSE, Yuri Lonchakov performed the first part of an extensive routing & cabling of SUBA Onboard Equipment Control System and SBI Onboard Data Measuring & Storage System instruments in the SM (Service Module), today unstowing the BSK-5V (Power Switch Assembly 5V, Blok cilovoiy kommutatsii-5V) components and readying the commutator for tomorrow's outfitting and connecting.

Lonchakov conducted the periodic data collection on the long-term BIO-5 Rasteniya-1 ("Plants-1") experiment, copying data from its built-in control computer to a PCMCIA memory card for subsequent downlink to the ground via OCA. The regular periodic equipment status check was listed for today on the Russian discretionary "as time permits" task list. *[Rasteniya-1 researches growth and development of plants under spaceflight conditions in the LADA-14 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). The payload hardware includes a module (MIS/Module for the Investigation of Substrates), the MIS control unit (BU), a nitrogen purge unit (BPA) and other accessories. During its*

operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. LADA consists of a wall-mounted growth chamber that provides long-term, ready access for crewmember interaction. It provides light and root zone control but relies on the cabin environmental control systems for humidity, gas composition, and temperature control. Cabin air is pulled into the leaf chamber, flows over the plants and vents through the light bank to provide both plant gas exchange and light bank cooling.]

The FE-1 also replaced procedures pages in RODF (Russian Operations Data File) books with updates delivered on Progress 31P. *[Changes involve the books on Medical Experiments (ME), Technical Experiments (TE), Scientific Experiments (NE),Progress M-01M/31P Transfer Ops. (new book replacing the old), RS EVA (2 new books), one ODF DVD disk with EVA-21 training video, and two ODF CD-ROM disks.]*

The US SODF (Systems Operations Data File) Medical Checklist book was updated by Magnus with P&I (Pen & Ink) changes.

Michael Fincke performed the periodic battery replacement in the prime CSA-CP (Compound Specific Analyzer-Combustion Products, #1045) unit.

In the US Airlock (A/L), the CDR then initiated the 85-day maintenance cycle on the first two EMU (Extravehicular Mobility Unit) batteries (#2074, #2075) in BCM3 (Battery Charger Module 3) and BCM4 in the US Airlock. The 16-Volt discharge takes ~13 hrs. *[The periodic battery maintenance consists of fully discharging and then recharging the storage units to prolong their useful life. After end of the maintenance cycle, Mike will restore the SSC (Station Support Computer) laptop, which is used in DOS mode for the automated discharge procedure, to nominal ops. In the early ISS years, these battery discharges/recharges had to be done manually.]*

In the A/L “bake-out” oven, Fincke also started the regeneration of the used METOX (Metal Oxide) CO_2 absorption canisters #0007 & #0011.

Yuri completed the routine daily servicing of the SM’s SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

The FE-1 also conducted the periodic checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the passageways SM PrK (Service Module Transfer Compartment)–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, and FGB GA–Node-1.

The regular daily IMS (Inventory Management System) maintenance task was also performed by Lonchakov by updating/editing the IMS standard "delta file" including stowage locations for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

In the COL (Columbus Orbital Module), FE-2 Magnus collected the equipment required for the subsequent software upgrade of the EDR (European Drawer Rack) laptop and performed the upgrade to Release 2.0.7, in three consecutive parts, mostly done without requiring continuous crew presence.

Afterwards, Sandy worked on troubleshooting the Ethernet connectivity of the MMA MLT (Microgravity Measurement Apparatus/MMA Laptop) in the Kibo JPM (Japanese Pressurized Module). *[MMA activities were aborted by the inability of the MLT to communicate via the PEHG (Payload Ethernet Hub Gateway). Troubleshooting was to include disconnecting & reconnecting the LAN cable and rebooting the MLT.]*

Fincke & Magnus completed the regular monthly session (their first) of the CHeCS (Crew Health Care Systems) emergency medical operations OBT (On-Board Training) drill, a 30-min. exercise to refresh their CMO (Crew Medical Officer)'s acuity in a number of critical health areas. The proficiency drills today focused on eye treatment. *[The HMS (Health Maintenance Systems) hardware, including ACLS (Advanced Cardiac Life Support) equipment, may be used in contingency situations where crew life is at risk. To maintain proficiency, crewmembers spend one hour per month reviewing HMS and ACLS equipment and procedures via the HMS and ACLS CBT (computer-based training). The training drill, each crewmember for him/herself, refreshes their memory of the on-orbit stowage and deployment locations, equipment etc. and procedures.]*

The new E-18 crewmember, Sandra Magnus, guided by CDR Fincke, performed a mandatory one-hour refresher OBT, i.e., an emergency equipment location & status drill for the case of rapid cabin depressurization, with Russian, US, European & Japanese specialists standing by at their control centers for crew questions or comments. The rule is that the emergency egress exercise should be performed by every new station crewmember once within seven days after departure of the previous crew. *[Background: Purpose of the drill is to (a) familiarize the new station resident with the location of hardware and the positions of valves used in*

emergency situations, (b) familiarize the crewmember with the egress route to the Soyuz, (c) practice crew emergency joint activities, and (d) identify crew comments and suggestions that arise during training regarding crew procedures and equipment. The full crew participates in the Soyuz checks, which are led by the Soyuz CDR (Lonchakov). After the Soyuz checks, the ISS CDR and the FE-2 proceeded with the remaining steps in the US Lab, Node-1, Node-2, COL and the two Kibo modules. The exercise was topped off by a thorough debrief with the ground via S-band. For the case of an onboard fire and for emergency descent, there are other mandatory emergency drill OBTs.]

In preparation for upcoming sample stowage, the FE-2 followed up on yesterday's ICEPAC insertion into MELFI (Minus-Eighty Laboratory Freezer for ISS) by retrieving two additional -32degC ICEPAC belts from stowage and inserting them into Dewar 1/Tray A, Sections 3 & 4.

Lonchakov spent another ~2 hrs on Progress 31P unloading, keeping track of moves & locations in the IMS and guided by an uplinked transfer list. *[Equipment delivered by the cargo ship include food containers, a new BKO multifiltration unit, five fresh BK-3M oxygen bottles for Orlan-M EVAs, a MNR separator pump, a new AK-1M air sampler kit, personal oral hygiene articles (SLG), a BPK condensate feed unit & its control panel, a Penguin-3 suit, an electrical stimulation suit, ASU toilet inserts, etc.]*

Sandy had an hour to herself for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residence, if she/he chooses to take it.

The ISS crew completed their physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

A new addition to the US discretionary "job jar" task list for FE-2 Magnus today was a run with the MedOps experiment WinSCAT (Spaceflight Cognitive Assessment Tool for Windows), her first onboard session, by logging in on the MEC (Medical Equipment Computer) laptop and performing the psychological evaluation exercise on the laptop-based WinSCAT application. *[WinSCAT is a monthly time-constrained questionnaire test of cognitive abilities, routinely performed by astronauts aboard the ISS every 30 days before or after the PHS (periodic health status) test or on special CDR's, crewmembers or flight surgeons request. The test uses cognitive subtests that measure sustained concentration, verbal working memory, attention, short-term memory, spatial processing, and math skills. The five cognitive subtests are Coding Memory - Learning, Continuous Processing Task*

(CPT), Match to Sample, Mathematics, and Coding Delayed Recall. These WinSCAT subtests are the same as those used during NASA's long-duration bed rest studies.]

ESP-3 Relocation Lookahead: Return of the External Stowage Platform 3 from its current (temporary) location on the MBS (Mobile Base System) to the zenith side of the P3 truss with the SSRMS (Space Station Remote Manipulator System) is planned for 12/5 (Friday).

CEO (Crew Earth Observations) photo targets uplinked for today were **Southwest Algeria Megafans** *(nadir and near-nadir mapping swaths were requested for ~60 secs. over this large site. Two megafans ["inland deltas]—one very large at 320 km radius—shows obvious radiating surface streams. The fans were laid down by rivers that flowed west out of local mountains when climates were wetter 5–15,000 years ago. These huge sediment masses have only recently been identified in this remotest part of the Sahara Desert. They are an analog for parts of Mars where enormous quantities of layered, apparently river-laid sediment, occur [especially in the high-interest area, Sinus Meridiani, where the rover Opportunity is still functioning]. Sediment has buried the base of hills along the northeast side of the megafan in a way that simulates buried Martian impact craters. Visual cues are major linear dunes located to the NW, and contorted rocks immediately east),* and **Central Algeria Megafans** *(northeast of the target above lies a complex of smaller fans, all right of track. Understanding details of these complex patterns will allow more sophisticated modeling of sedimentary layers on Mars [underway]).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 8:31am EST [= epoch]):
Mean altitude -- 353.9 km
Apogee height -- 358.5 km
Perigee height -- 349.4 km
Period -- 91.62 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006711
Solar Beta Angle -- -28.9 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours – 94 m
Revolutions since FGB/Zarya launch (Nov. 98) – 57518.

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
12/07/08 -- Progress M-65/30P reentry (after 3 weeks autonomous flight for

geophysical experiments)
12/17/08 -- Progress M-01M/31P thruster firing (test with Soyuz docked at SM aft);
12/18/08 -- Russian EVA-21
02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Endeavour/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/02/08
Date:	Tuesday, December 02, 2008 1:46:22 PM
Attachments:	

ISS On-Orbit Status 12/02/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Fincke, FE-1 Lonchakov & FE-2 Magnus began their workday before breakfast with the periodic session of the Russian biomedical routine assessments PZEh-MO-7/Calf Volume Measurement & PZEh-MO-8/Body Mass Measurement, using the IM mass measurement device which Yuri broke down afterwards for stowage. *[Calf measurements (left leg only) are taken with the IZOG device, a custom-sewn fabric cuff that fits over the calf, using the knee and lower foot as fixed reference pints, to provide a rough index of deconditioning in zero-G and effectiveness of countermeasures. For determining body mass in zero-G, where things are weightless but not massless, the Russian IM "scales" measure the inertial forces that arise during the oscillatory motion of a mass driven by two helical metering springs with known spring constants. By measuring the time period of each oscillation of the unknown mass (the crewmember) and comparing it to the period of a known mass, the crewmember's mass is calculated by the computer and displayed.]*

FE-2 Magnus ended her FD15 (Flight Day 15) session with the NASA/JSC experiment NUTRITION w/Repository, her first, by collecting a final urine sample upon wakeup for storage in the MELFI (Minus-Eighty Laboratory Freezer for ISS). The sampling kit was then stowed away. Sandra's next activity with this experiment will be the FD30 session. *[The current NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

For the second checkout for the JAXA HTV (H-II Transfer Vehicle) PROX space-to-space communication system, the FE-2 connected the drag-thru cable and powered up the PROX system at the ICS (Inter-orbit Communication System) rack, then set up the HCP (Hardware Command Panel) in the US Lab for a functional selfcheck by pressing buttons and checking responses. *[The checkout was then performed again from the ground during overflight of the Japan ground station at Tanegashima. The HCP is part of the PROX system, mostly located in the ICS rack, consisting also of a PROX antenna, a PROX-GPS (Global Positioning System) antenna, and PROX comm equipment for the HTV (H-II Transfer Vehicle). When the HTV approaches the ISS, the external PROX antenna, which contains GPS receivers, will initiate communications with the HTV. The ISS orbital location and speed are immediately relayed to the HTV through the PROX. At the same time, data from the HTV are relayed to the ISS. In addition, the antenna relays commands sent from the ground to the HTV.]*

CDR Fincke had ~4:45 hrs set aside for installing the new WHC (Waste & Hygiene Compartment) rack in the Lab and configuring it for activation, in two parts, separated by a rest period for lunch.

FE-1 Lonchakov spent ~4 hrs on Progress 31P unloading and keeping track of moves & locations in the IMS (Inventory Management System), guided by an uplinked transfer list. *[Equipment delivered by the cargo ship include food containers, a new BKO multifiltration unit, five fresh BK-3M oxygen bottles for Orlan-M EVAs, a MNR separator pump, a new AK-1M air sampler kit, personal oral hygiene articles (SLG), a BPK condensate feed unit & its control panel, a Penguin-3 suit, an electrical stimulation suit, ASU toilet inserts, etc.]*

Yuri also launched Part 2 of the MAI-75 experiment by activating the hardware during overflight of receiving stations and later turning it off again. *[MAI-75 is essentially a Kenwood amateur radio station with special VS-N1 (Visual Communicator) gear for downlinking photographic images in SSTV (Slow Scan Television) mode. The payload, which is run in automatic mode until the hardware is deactivated, is named after the renowned Moscow Aviation Institute (MAI) and its 75th anniversary, whose reputation is based on the large number of famous aviators and rocket scientists that received their academic education here. Among the alumni are Academicians and Corresponding Members of the Russian Academy of Sciences. Over 100 General and Chief Designers earned their degree at MAI, with famous rocket scientists like Makeyev, Mishin, Nadiradze and Yangel. MAI also fostered 20 Pilot-Cosmonauts, almost 100 famous test pilots, Heroes of the Soviet Union and Russia. The amateur radio (ham) equipment aboard the ISS for downlinking SSTV imagery is an MAI product.]*

One of the more pleasant jobs for Sandy today had to be her feeding the butterflies

in their Butterfly Habitat of the CGBA-5/CSI-3 (Commercial Generic Bioprocessing Apparatus Science Insert 3). *[This involved powering down and decabling the payload, sliding it out of its stowage locker and pulling a knob in its interior to expose nectar to the butterflies. The steps were then reversed and the payload powered up again.]*

Inside the Progress 31P, CDR Mike Fincke meanwhile unstowed a bag with new PCBA (Portable Clinical Blood Analyzer) cartridges bag with two measurement pouches, which he then inserted in the MELFI (Minus-Eighty Laboratory Freezer for ISS) for the upcoming SOLO (Sodium Loading in Microgravity) experiment which calls for blood and urine samples.

In preparation for the upcoming sample stowage, the FE-2 also prepared the MELFI by retrieving two -32deg ICEPAC belts from stowage and inserting both into Dewar 1/Tray A, Sections 1 & 2.

Magnus finished her VolSci (Voluntary Science) session with the CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS) experiment, started yesterday, by wrapping up its 24-hr heart rate data collection. *[After doffing the HM2 (Holter Monitor 2) equipment with its six electrode leads and two CCISS Actiwatches, Sandy downloaded their accumulated data to the HRF2 (Human Research Facility 2) PC2 laptop, then stowed the equipment.]*

Afterwards, the FE-2 went on a search for two CTBs (Cargo Transfer Bags, #1002, #1313) and did locate them in the back of an overhead storage space in the Kibo JPM.

In the COL (Columbus Orbital Laboratory), Sandy relocated BIOLAB syringe equipment.

Yuri Lonchakov completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM (Service Module). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

FE-2 Magnus performed the planned TOCA (Total Organic Carbon Analyzer) software upgrade with improved parameters based on a previous downlink, by installing a USB drive, then transferring the new data and finally rebooting TOCA, now ready for sample analysis.

The three crewmembers completed the monthly session (their first) of the CHeCS (Crew Health Care Systems) emergency medical operations OBT drill, a 30-min.

exercise (+30 min. for pen & ink procedures updates) to refresh their CMO (Crew Medical Officer)'s acuity in a number of critical health areas. The proficiency drill today focused on CPR (cardiopulmonary resuscitation), specifically on tracheal intubation. *[The HMS (Health Maintenance Systems) hardware, including ACLS (Advanced Cardiac Life Support) equipment, may be used in contingency situations where crew life is at risk. To maintain proficiency, crewmembers some time each month reviewing HMS and ACLS equipment and procedures via the HMS and ACLS CBT (computer-based training). The training drill, each crewmember for him/ herself, refreshes their memory of the on-orbit stowage and deployment locations, equipment etc. and procedures.]*

VolSci Program Preview: For the weekend of 12/6 & 12/7, Mike and Sandy were offered three choices for the Voluntary Weekend Science program: (1) JAXA Marangoni Clean Up (Part 1 of 2) of Silicone Oil inside the Marangoni Experiment Cell; (2) ESA Video Lesson ESA - 1 (VLE-1) - "Design elements that improve living/ working", demonstrating how effective industrial design can help overcome the living/working problems on the ISS; and (3) Video Lesson ESA – 1 (VLE-1) - "An ordinary meal", highlighting the different ways of eating during the day, focusing on a solitary and ordinary breakfast during a working day on the ISS.

FE-2 Magnus had an hour to herself for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residence, if she/he chooses to take it.

The ISS crew completed their physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-2, FE-1), and VELO bike with bungee cord load trainer (FE-1).

The crew had their periodic PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Sandy at ~10:25am, Yuri at ~10:40am, and Mike at ~1:25pm EST.

At ~4:00pm, the ISS crew will have their regular weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC (Station Support Computer)].*

At ~4:20pm, just before sleep time, Yuri will set up the Russian MBI-12 SONOKARD (Sonocard) payload and start his third experiment session, using a sports shirt from the SONOKARD kit with a special device in the pocket for testing a new method for acquiring physiological data without using direct contact on the skin. Measurements are recorded on a data card for return to Earth.
[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2)

systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]

CEO (Crew Earth Observations) photo targets uplinked for today were Sao Paulo-Rio de Janeiro Aerosol *(looking right for possible smog plumes blowing offshore from these great cities. Smog is visible best against the sea as background. Views outside the glint disc are preferred and views through possible scattered cumulus are useful),* and Ouarkziz Impact Crater, Algeria *(evening light should be strong enough to see this almost completely circular 3.5 km-diameter structure, but also to reveal much detail. Looking left of track just within the dark ranges of the Atlas Mt. foothills)*.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 11:12am EST [= epoch]):
Mean altitude -- 354.0 km
Apogee height -- 358.4 km
Perigee height -- 349.7 km
Period -- 91.62 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006479
Solar Beta Angle -- -24.0 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours – 27 m
Revolutions since FGB/Zarya launch (Nov. 98) – 57504.

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
12/07/08 -- Progress M-65/30P reentry (after 3 weeks autonomous flight for geophysical experiments)
12/17/08 -- Progress M-01M/31P thruster firing (test with Soyuz docked at SM aft);
12/18/08 -- Russian EVA-21
02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)

03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Endeavour/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 12/01/08
Date:	Monday, December 01, 2008 11:14:20 AM
Attachments:	

ISS On-Orbit Status 12/01/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 6 of Increment 18. The ISS crewmembers, CDR Michael Fincke, FE-1 Yuri Lonchakov and FE-2 Sandra Magnus, are back on their regular wake/sleep cycle (1:00am – 4:30pm EST).*

STS-126/Endeavour returned to Earth last night after 15d 20h 29m in space, i.e., the longest Shuttle mission to ISS so far, touching down at Edwards Air Force Base, California, on the first opportunity at 4:25pm EST, after 250 orbits & 6.6 million miles. Gregory Chamitoff's total time in space is 183d 22m (178d 23h 50m on board ISS). *[It was the 124th flight of a Space Shuttle, the 27th Shuttle mission to visit the station, the 22nd for Endeavour and the 52nd Shuttle landing at Edwards.]*

As part of the crew's regular morning inspection tour, FE-1 Lonchakov conducted the routine checkup of DC1 (Docking Compartment) circuit breakers and fuses. *[The monthly checkup in the "Pirs" module looks at AZS circuit breakers on the BVP Amp Switch Panel (they should all be On) and the LEDs (light-emitting diodes) of 14 fuses in fuse panels BPP-30 & BPP-36.]*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the SM (Service Module) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

As part of the house cleaning, Yuri conducted regular maintenance inspection & cleaning on fan screens in the FGB (TsV2), DC-1 (V3) and SM (VPkhO, VPrK, FS5, FS6 & FS9).

First activity this morning for FE-2 Magnus was to start on her Flight Day 15 (FD15) session with the NASA/JSC experiment NUTRITION w/Repository. This was an all-day session, the first for Sandy, of collecting urine samples several times for 24 hrs, to continue through first void tomorrow morning. *[After performing phlebotomy with the help of CDR Fincke, i.e., drawing blood samples (from an arm vein), the samples were first allowed to coagulate in the Repository for 20-30 minutes, then spun in the HRF RC (Human Research Facility/Refrigerated Centrifuge) and finally placed in MELFI (Minus-Eighty Laboratory Freezer for ISS). No thruster activity was allowed during the blood drawing. The RC was later powered off after a temperature reset to limit wear on the compressor, and cleaned. The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by supercold MELFI dewars), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

In preparation for an upcoming software update, Fincke relocated the TOCA (Total Organic Carbon Analyzer) USB drive to the SSC-7 laptop.

Both Magnus and Fincke took on VolSci (Voluntary Science) activities today:
The FE-2, who had chosen CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS) for her VolSci option, started out by changing out the UltraBay drive of the HRF2 (Human Research Facility 2) PC2 laptop. Sandy then began her first 24-hr. on-orbit session with the CCISS experiment (with Mike acting as operator and photographer) by donning the HM2 (Holter Monitor 2) and the CBPD (Continuous Blood Pressure Device), performing the Baro Study, and starting the 24-hr passive heart rate data collection. Data are recorded on a PCMCIA memory card, with the HRF (Human Research Facility) rack laptop for control. Equipment doffing and stowage is scheduled tomorrow after the 24-hr period, followed by data downlink on Wednesday. *[CCISS studies the effects of long-duration spaceflight on crewmembers' heart functions and their blood vessels that supply the brain (= "cerebrovascular"). Learning more about the changes in cardiovascular & cerebrovascular systems in zero-G could lead to specific countermeasures that might better protect future space travelers. For the Baro study of CCIS, heart rate and blood pressure are being recorded for resting and timed breathing for 5 min, with no caffeine or food (water is acceptable) allowed two hours before the start of the Baro Study and no exercise prior to the Baro Study.]*

For his own VolSci selection, a Phase 2 sampling session with the LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System), CDR Fincke

reviewed an OBT (Onboard Training) brief, then completed sampling/swabbing at two different sites in the COL (Columbus Orbital Module), using the Glucan LAL Cartridges which specifically detect the fungal cell wall molecule “glucan”.
[LOCAD uses small, thumb-sized “microfluidic” cartridges that are read by the experiment reader. The cartridges contain dried extract of horseshoe crab blood cells (LAL/Limulus amebocyte lysate) and colorless dye. LAL tests are used for the detection and quantification of bacterial endotoxins: in the presence of the bacteria, the dried extract reacts strongly to turn the dye a green color. Therefore, the more green dye, the more microorganisms there are in the original sample. Glucans are complex carbohydrate (sugar, D-glucose) macromolecules. The handheld device tests this new analysis technology by sampling for the presence of gram negative bacteria in the sample in about 15 minutes, showing the results on a display screen. Background: Lab-on-a-Chip technology has an ever-expanding range of applications in the biotech industry. Chips are available (or in development) which can also detect yeast, mold, and gram positive bacteria, identify environmental contaminants, and perform quick health diagnostics in medical clinics. The technology has been used to swab the MERs (Mars Exploration Rovers) for planetary protection. With expanded testing on ISS, began by Sunita Williams in March/April last year, this compact technology has broad potential applications in space exploration--from monitoring environmental conditions to monitoring crew health. The current study should prepare for long-duration exploration by demonstrating a system that enables the crew to perform biochemical analysis in space without having to return samples to Earth.]

In the newly arrived Progress M-01M/31P, docked at the DC1 nadir port, Lonchakov installed the LKT local temperature sensor switch (TA251M1B) of the BITS2-12 onboard telemetry system and its ROM/read-only memory unit (PZU TA765B), both kept in storage from an earlier vehicle.

Afterwards, Yuri performed the routine task of taking two photos of the internal part of the DC1 nadir port’s SSVP-StM docking cone, used for yesterday’s Progress TORU linkup. The pictures, which are necessary to refine the current understanding of docking conditions (particularly after the rare manual TORU docking), were then transferred to OCA for subsequent downlinking. *[The objective is to take photo imagery of the scratch or scuff mark left by the head of the active docking probe on the internal surface of the passive drogue (docking cone) ring, now rotated out of the passageway. As other crewmembers before him, the FE-1 used the Nikon D1X digital still camera to take two pictures each with the hatch closed down.]*

In the RS (Russian Segment), Lonchakov used CWC (Contingency Water

Container) #1069 for the periodic (about twice a month) replenishing of the Elektron oxygen generator's water supply for electrolysis, filling the KOV thermal loops' EDV container. Once filled, the EDV was connected to the BPK transfer pump for processing. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron shutdown.]*

The FE-1 also set up and activated the SSTV (Slow Scan TV) equipment for conducting the MAI-75 experiment, essentially a ham radio set-up with Kenwood VS-N1 (Visual Communicator) gear for downlinking photographic images. The experiment is run in automatic mode until the hardware is deactivated. *[The payload is named after the renowned Moscow Aviation Institute (MAI) whose reputation is based on the large number of famous aviators and rocket scientists that received their academic education here. Among the alumni are Academicians and Corresponding Members of the Russian Academy of Sciences. Over 100 General and Chief Designers earned their degree at MAI, with famous rocket scientists like Makeyev, Mishin, Nadiradze and Yangel. MAI also fostered 20 Pilot-Cosmonauts, almost 100 famous test pilots, Heroes of the Soviet Union and Russia. The amateur radio (ham) equipment aboard the ISS for downlinking SSTV imagery is an MAI product.]*

In JAXA's Kibo JPM (Japanese Pressurized Module), Sandy Magnus supported the new ICE CRYSTAL experiment, ground-commanded from the SSIPC (Space Station Integration & Promotion Center) at Tsukuba/Japan, by activating the MMA (Microgravity Measurement Apparatus) and its laptop (MLT), first powering up the MMA's NCU/RSU (Network Control Unit/Remote Sensor Unit) set from the Ryutai rack's UDC (Utility DC-to-DC Converter), then turning on both NCU/RSU and MLT. *[Sandy set up the SCOF (Solution Crystallization Observation Facility) for the ICE CRYSTAL (The Study on Microgravity Effect for Pattern Formation of Dendritic Crystal by a Method of in-situ Observation) payload on 11/27, the first of the JAXA Increment 18 experiments. It evaluates the factors that lead to pattern formation in ice crystals in microgravity. Tsukuba/SSIPC successfully completed optical adjustments of the payload by end of last week. During Increment 18, 105 runs (parameters) are planned, usually during crew sleep time to avoid microgravity disturbance. All activities except UDS/MMA on/off can be performed remotely by the ground.]*

The FE-1 collected the periodic readings of potentially harmful atmospheric contaminants in the SM, using the CMS (Countermeasure System), a component of the SKDS GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, today using preprogrammed microchips to measure for o-Xylol (1,2-Dimethylbenzol, C_8H_{10}) and Methyl-Mercaptan (Methanethiol, CH_4S).

Yuri also completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The ISS crew completed their physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-2, FE-1), and VELO bike with bungee cord load trainer (FE-1).

At ~3:00am EST, CDR Fincke powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, & power supply) and conducted, at 3:05am, a ham radio session with St Anthony's College, Shillong, India. *[St. Anthony's College is the Alma Mater of Mr. Rupesh Saikia, Mike Fincke's father-in-law. Founded in 1934 by Fathers of the Don Bosco Society, St.Anthony's is one of the oldest colleges in the North East India. The college is situated in Shillong, a picturesque hill station in India, considered as the 'Scotland of the East'. Since its humble beginning 74 years ago, the college has grown manifold in size and ranking. Today, it has 28 departments with 120 teaching staff, 60 support staff and over 2100 students, and is considered as a premier institute of education in the whole country of India. Students from the various states of the country as well as some foreign countries like Nepal, Bhutan, Bangladesh, Zambia etc. are studying here. Questions to Mike were uplinked beforehand. "Do you see any man-made objects like the Great Wall of China or the Pyramids etc from the ISS on earth?"; "How does the human body adjust the balance in outer space?"; "Do you notice any affect of pollution or climate change destroying the beauty of the earth?"; "What type of food do you eat and drink there?"; "What is it you miss most of the earth as you are out in the space?"; "What do you do when one of you get sick?"; "Do you make oxygen there? How do you breathe?"; "What happens when you are in space and the shuttle starts to malfunction?"; "How does it feel to come back into the earth's atmosphere?"; Can You say something in Assamese?"; "We came to know that you know several languages like Japanese, Russian etc. Do you want to learn some words of Khasi language, the language of our state?"]*

At ~2:30pm, the crewmembers are scheduled to convene for their standard bi-weekly teleconference with the JSC Astronaut Office (Steve Lindsey), via S-band S/G-2 audio & phone patch.

Working off the Russian discretionary "time permitting" task list, Lonchakov performed the regular status check on the Russian BIO-5 Rasteniya-1 ("Plants-1") experiment. *[Rasteniya-1 researches growth and development of plants under*

spaceflight conditions in the LADA-14 "greenhouse" from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). The payload hardware includes a module (MIS/ Module for the Investigation of Substrates), a MIS control unit (BU), a nitrogen purge unit (BPA) and other accessories. During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording.]

Remaining on Sandy's voluntary "job jar" task list is to route a cable between the Node-2 and the HCP (Hardware Command Panel) in the JPM (but not yet mated since it is a hatch drag-thru line). *[The HCP is part of the PROX system, mostly located in the ICS (Inter-orbit Communication System) Rack, consisting also of a PROX antenna, a PROX-GPS (Global Positioning System) antenna, and PROX comm equipment for the HTV (H-II Transfer Vehicle). When the HTV approaches the ISS, the external PROX antenna, which contains GPS receivers, will initiate communications with the HTV. The ISS orbital location and speed are immediately relayed to the HTV through the PROX. At the same time, data from the HTV are relayed to the ISS. In addition, the antenna relays commands sent from the ground to the HTV.]*

Progress M-01M/31P Docking Update: Yesterday's manual docking of 31P by Yuri Lonchakov with the TORU came about because of a computer malfunction. During the spacecraft's final approach, at a range of 20-30m at ~7:22am EST, the Progress computer aborted the final approach and initiated a backout to Stationkeeping, also switching from Kurs-A Set 1 to Set 2. This left TsUP-Moscow with two options for completing the docking: (1) Re-initiating final approach in automated mode with the Kurs-A Set 2, or (2) directing the crew to take manual control via TORU. TsUP opted for the latter. The crew switched to TORU immediately and completed the docking manually at 7:28am. TsUP is investigating this anomaly and has not yet determined the root cause.

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 3:13am EST [= epoch]):
Mean altitude -- 354.1 km
Apogee height -- 358.4 km
Perigee height -- 349.8 km
Period -- 91.62 min.
Inclination (to Equator) -- 51.64 deg

Eccentricity -- 0.0006389
Solar Beta Angle -- -19.3 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours – 133 m
Revolutions since FGB/Zarya launch (Nov. 98) – 57483.

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
12/07/08 -- Progress M-65/30P reentry (after 3 weeks autonomous flight for geophysical experiments)
12/17/08 -- Progress M-01M/31P thruster firing (test with Soyuz docked at SM aft);
12/18/08 -- Russian EVA-21
02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Endeavour/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/30/08
Date:	Sunday, November 30, 2008 1:42:53 PM
Attachments:	

ISS On-Orbit Status 11/30/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – Progress docking day for CDR Fincke, FE-1 Lonchakov & FE-2 Magnus. Crew wake-up 3:00am; sleep 4:30pm EST. Ahead: Week 6 of Increment 18.*

Yest kasaniye! At 7:28am EST, Progress M-01M (31P) docked smoothly at the DC1 (Docking Compartment) nadir port under manual TORU control by Lonchakov & Fincke, followed by a final DPO post-contact thrusting burn, docking probe retraction and hook closure ("sborka") after motion damp-out, while the ISS was in free drift for ~20 min. At "hooks closed" signal, the SM (Service Module) returned to active attitude control, maneuvering the ISS to LVLH TEA (local vertical/ local horizontal Torque Equilibrium Attitude). Control authority returned to US Momentum Management at ~8:55am. *[Launched on 11/26 (7:38am EST), the cargo vehicle took two days longer than usual for the flight to the ISS to allow enough checkout time for its new avionics. The 7288-kg (16,070-lb) mass cargo drone delivered 2676 kg (5,900 lb) of various supplies to the ISS, including 28 kg (62 lb) oxygen, 21 kg (46 lb) air, 185 kg (408 lb) water, 296 kg (653 lb) food, 1,120 kg (2469 lb) propellant (for ISS needs), 321 kg (708 lb) US items, 171 kg (377 lb) sanitary & hygienic items, 19 kg (42 lb) fire-protection items, 133 kg (293 lb) medical items, 103 kg (227 lb) utilization/science payloads and various equipment. 31P is the first of a new, upgraded version of the cargo ship, equipped with a new state-of-the art digital computer system and more-compact radiotelemetry avionics. The new equipment allows automatic diagnostics for the comm paths between telemetry system & computer system elements and provides digital interfaces for integrating all the spacecraft systems into the ISS. It has 75 kg (165 lb) less dry mass than previous Progress vehicles, allowing more cargo, and has 15 fewer parts. Note: Soyuz & Progress flights are supported by (currently) 11 RGS stations: five connected to TsUP-Moscow by fiber-optic land line, four by the "Primyorka" geostationary satellite, and two in autonomous mode. Real-time commanding is normally performed directly by the RGS sites, with voice link to/from TsUP. There is also a tracking ship, "Cosmonaut Posayev" (KVP 47), in the port of*

Kaliningrad.]

STS-126/Endeavour Landing: Both landing opportunities at KSC have been waived off for today due to inclement weather conditions. Endeavour will land at Edwards/California at the first opportunity – 4:25m EST, after deorbit burn at 3:19pm. If the landing takes place as planned, ULF-2 mission duration will be 15d 20h 26m. Gregory Chamitoff's total time in space will be 183d 19m (178d 23h 47m on board ISS).

Most of the crew's time today went to preparing and supporting the Progress 31P docking. Pre-docking activities called for Sandra Magnus to –

- Ensure closure of the protective shutters of the science window in the JAXA JPM (JEM Pressurized Module) and in the US Lab,
- Power down the amateur radio equipment in the FGB, to prevent RF (radio frequency) interference with Progress final approach and docking, and
- Activate & configure the A31p laptop to support the transmission of MPEG2 streaming video from the RS via OpsLAN/Ku-band and US assets to Moscow.

Mike Fincke & Yuri Lonchakov meanwhile prepared their workplace at the TORU control station in the SM and operated the controls for the final approach & docking of the cargo ship. *[TORU is the manual mode through which a crewmember can perform necessary guidance functions from the SM in the event of a failure of the KURS automated rendezvous and docking (AR&D) of the Progress. TsUP-Moscow selected the TORU mode after the failure of the Kurs antenna ASF2 (also referred to as 2ASF1-M-VKA No. 2) failed to deploy after launch on 11/26. The antenna was later deployed by direct command and brought online during docking day at a distance of 1 km from the ISS and used during final approach (starting at ~160 m). However, since TsUP was uncertain whether troubleshooting could be completed by docking day, TORU was selected to be on the safe side. Lonchakov, supported by Fincke, controlled the cargo ship's motions from the TORU control panel with two hand controllers, viewing the approach to the ISS from a Progress point-of-view through the Klest-M television camera mounted on the Progress. Remote TORU control from the ground is not available.]*

After the cargo ship's successful docking, activities by Yuri & Mike included –

- Shutting off TORU and reconfiguring the STTS telephone/telegraph subsystem to normal ops *[the "Voskhod-M" STTS enables telephone communications between the SM, FGB, DC1 and USOS, and also with users on the ground over VHF channels selected by an operator at an SM comm panel, via STTS antennas on the SM's outside. There are six comm panels in the SM with pushbuttons for accessing any of three audio channels, plus an intercom channel. Other modes of the STTS include*

telegraphy (teletype), EVA voice, emergency alarms, Packet/Email, and TORU docking support];

- Conducting the standard one-hour leak checking of the docking vestibule and fuel/oxidizer transfer line interface between Progress and DC1 *[during leak checking and initial clamp installation, Russian thrusters were inhibited (as was the case during docking)]*;
- Opening the hatches (~10:20am) and installing the QD (quick disconnect) screw clamps (BZV) of the docking & internal transfer mechanism (SSVP) to rigidize the coupling;
- Performing the standard air sampling inside Progress with the Russian AK-1M air sampler;
- Powering down the spacecraft and installing the ventilation/heating air duct (~11:15am);
- Dismantling & removing the video/MPEG equipment for the TV Ku-band downlink of the docking; and
- Dismantling the docking mechanism (StM, Stykovochnovo mekhanizma) between the cargo ship and the DC1 (~12:00pm). *[The StM is the "classic" probe-and-cone type, consisting of an active docking assembly (ASA) with a probe (SSh), which fits into the cone (SK) on the passive docking assembly (PSA) for initial soft dock and subsequent retraction to hard dock. The ASA is mounted on the Progress' cargo module (GrO), while the PSA sits on the docking ports of the SM, FGB and DC1.]*

Before sleep time, Fincke & Lonchakov also have about an hour reserved for starting 31P unloading and cargo transfers, foremost fresh veggies and other food items.

FE-2 Magnus meanwhile performed the standard sensor calibration on the CSA-O_2 (Compound Specific Analyzer-Oxygen) units #1043 & #1059, delivered on 1J, using a new calibration adapter (#1001), brought up by 30P. *[Sandy reported an initial gas pressure of 1500 psi and final gas pressure of 1400 psi. Flow rate: 10 fps. For #1059, peak reading was 22% O_2 and the final cabin value was 22%; for #1043, peak: 25.3%, final cabin value: 22%.]*

The FE-2 also completed another one of the periodic inspections of the RED (Resistive Exercise Device) canister cords and accessories, currently done every two weeks.

In the SM, Magnus conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS), including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among*

else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]

SOZh checkups by Sandy included the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem, gathering weekly data on total operating time & "On" durations for reporting to TsUP-Moscow.

The FE-2 handled the daily IMS (Inventory Management System) maintenance, updating/editing the standard IMS "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Later, Magnus had about 1.5 hrs for unpacking and IMS-supported stowing of ULF2-delivered cargo items.

In preparation for upcoming sample storage requirements, the FE-2 rearranged box modules in the MELFI (Minus Eighty Degree Laboratory Freezer for the ISS) in the US Lab, swapping Dewar 3/Tray A (Section 1,2) with Dewar 4/Tray B (Section 3 and 4).

And before sleep time, Sandy will break out and set up the NUTRITION with Repository hardware for her first session, starting tomorrow with blood draw and urine collections. The protocol requires Magnus to begin the usual 8-hr fast tonight by 5:00pm EST, i.e., no food or drink, but water consumption is highly encouraged to ensure proper hydration. *[Sandy's 24-hour urine collect starts with the first void of the day tomorrow morning and continues through the first void Monday morning. The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by supercold MELFI dewars), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

The FE-2 today performed the first leak check of WRS1 (Water Recovery System 1) and WRS2. *[Since the racks are still powered, the leak check was an external visual check only, without touching internal parts.]*

Before sleep time, Mike Fincke will voluntarily complete the software loading and hardware setup for the MERLIN (Microgravity Experiment Research Locker/ Incubator) payload, which had been added to the "job jar" task list yesterday.

The ISS crew completed their physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

ISS Crew Sleep Shift Planning: To synchronize the ISS crew's timeline with STS-126/ULF-2 undocking yesterday, ISS crew wake/sleep cycle has undergone a number of one-hour shifts which started on 11/25. After today's shift, wake/sleep schedule returns to "normal" tomorrow (all times EST):

11/30	Wake: 3:00am – 4:30pm
12/01	Wake: 1:00am – 4:30pm

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 8:43am EST [= epoch]):
Mean altitude -- 354.2 km
Apogee height -- 358.5 km
Perigee height -- 349.8 km
Period -- 91.62 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006502
Solar Beta Angle -- -14.5 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours – 44 m
Revolutions since FGB/Zarya launch (Nov. 98) – 57471.

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
11/30/08 -- STS-126/Endeavour/ULF-2 landing (EDW/1st: 4:25m; EDW/2nd: 6:03pm.);
12/07/08 -- Progress M-65/30P reentry (after 3 weeks autonomous flight for geophysical experiments)
12/17/08 -- Progress M-01M/31P thruster firing (test with Soyuz docked at SM aft);
12/18/08 -- Russian EVA-21
02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking

02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch

Six-person crew on ISS

07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Endeavour/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/29/08
Date:	Saturday, November 29, 2008 12:50:33 PM
Attachments:	

ISS On-Orbit Status 11/29/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – off-duty day for CDR Fincke, FE-1 Lonchakov & FE-2 Magnus. Crew wake-up 4:30am; sleep 6:00pm EST.*

Yuri Lonchakov performed the periodic maintenance of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #2 of the regenerable dual-channel filtration system. The process will be terminated at ~5:45pm EST. Bed #1 regeneration was performed yesterday. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently (last time: 11/7-8).]*

In the Service Module (SM), the FE-1 completed the routine daily servicing of the SOZh system (ECLSS/Environment Control & Life Support System). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

Yuri also temporarily powered down the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem for the periodic cleaning of its pre-filter, using the vacuum cleaner with narrow-slit nozzle attachment.

For her initial use of the TVIS treadmill, Sandy Magnus installed and checked out the SPD (Subject Positioning Device) top assemblies for safety, required for her first seven TVIS uses.

In preparation for the Progress docking, FE-2 Magnus closed the protective window shutters in the Lab and Kibo JPM (Japanese Pressurized Module).

A new item added to Sandy's voluntary "job jar" task list is to route a cable between the Node-2 and the HCP (Hardware Command Panel) in the JPM (but not yet mated since it is a hatch drag-thru line). *[The HCP is part of the PROX system, mostly located in the ICS (Inter-orbit Communication System) Rack, consisting also of a PROX antenna, a PROX-GPS (Global Positioning System) antenna, and PROX comm equipment for the HTV (H-II Transfer Vehicle). When the HTV approaches the ISS, the external PROX antenna, which contains GPS receivers, will initiate communications with the HTV. The ISS orbital location and speed are immediately relayed to the HTV through the PROX. At the same time, data from the HTV are relayed to the ISS. In addition, the antenna relays commands sent from the ground to the HTV.]*

Also showing on Magnus' task list is software loading and hardware setup for the MERLIN (Microgravity Experiment Research Locker/Incubator) payload, with the latter requiring prior notification of POIC (Payload Operation & Integration Center/ Huntsville).

Working from his discretionary "as time permits" task list, Yuri conducted another run of the Russian DZZ-2 "Diatomeya" ocean observations program, using the NIKON-F5 DCS still camera and the HDV (high-definition) video camcorder from SM window #7 for ~25 min to record Pacific Ocean surface features East of New Zealand and offshore of Panama, as affected by underlying terrain.

A second job for Yuri's choice was another ECON KPT-3 test session, making observations and taking aerial photography of Pacific Ocean surface contaminations for Russia's Environmental Safety Agency (ECON) using the D2X with SIGMA 300-800mm telephoto lens.

Fincke & Magnus are scheduled for their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Sandy at ~1:30pm EST, Mike at ~3:05pm.

The ISS crew completed their physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-2, FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (FE-1).

Mike & Yuri had a 1-hr. conference via S-band with ground specialists at TsUP-Moscow to discuss timeline and procedures for tomorrow's Progress docking:

Timeline for Progress M-01M/31P Rendezvous & Docking on 11/30 *(all times EST):*

- SM Solar Arrays feathering ~5:30am
- VHF Comm Pass (RGS) 5:36-15:58am
- Kurs-A Activation 5:40am
- Kurs-P Activation 5:42am
- Kurs signal acquisition assured 6:09am (T 2)
- Kurs Test Disabled 6:38am (T 6)
- SM GO for final approach ~6:42am (T7)
- Begin Flyaround @ 400 m ~6:52am
- Begin stationkeeping ~7:01am
- Final approach init. ~7:16am
- Local Sunset 7:23am
- Contact (capture) ~7:25am (T9)
- SM Kurs-P deact. on mech. capture (T 3)
- Local Sunrise 7:56am

ISS Crew Sleep Shift Planning: To synchronize the ISS crew's timeline with STS-126/ULF-2 undocking yesterday, ISS crew wake/sleep cycle has undergone a number of one-hour shifts which started on 11/25. For the next three days, the wake/sleep shift schedule is as follows, returning to "normal" on 12/1 (all times EST):

11/29	Wake: 4:30am – 6:00pm
11/30	Wake: 2:30am – 4:30pm
12/01	Wake: 1:00am – 4:30pm

Weekly Science Update *(Expedition Eighteen -- Week 5)*

3-D SPACE: Last (fourth) session for Greg has been successfully performed on 11/23. "Thank you, Greg, for your nice participation to the experiment as first test subject! We are glad that you also enjoyed it."

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Complete.

ANITA (Analyzing Interferometer for Ambient Air): Complete.

BCAT-3/4 (Binary Colloidal Alloy Test 3/4): No news.

BIO-4: Complete.

BIOLAB: Some BIOLAB troubleshooting activities, which consist of removing a stuck triple contained syringe, are currently planned on 12/2.

CARDIOCOG-2: Complete.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): In progress. For the next CCISS session, Mike will be using a newly refurbished unit that will arrive on ULF-2.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-3/CGBA-5 (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus 5): "The hungry caterpillars wish to thank you for supplying them with fresh food! We expect at least one or two of them to form chrysalises in the coming week. This past week we saw each spider build an excellent web. The smaller spider has been hiding the past two days and we suspect she is preparing to molt. We may see a much larger spider emerge if/when she comes out of hiding. The fruit flies are flourishing."

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

EDR (European Drawer Rack): A software upgrade activity is currently planned on 12/03 with the support of the crew. This upgrade is required to prepare for the PCDF (Protein Crystallization Diagnostic Facility) experiment during the 15A Stage.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): The DHPU (Data Handling Processing Unit) MIL-BUS error occurred again on 11/20, but instruments were brought back to nominal operations within 2.5 hrs. Similar MIL Bus errors have occurred on 11/5, 11/15 and 11/17. Ground teams are now investigating what could cause this increased frequency of failures. -- DEBIE-2: 24-hrs science script executed, to support debris monitoring in conjunction with the ULF2 EVAs to clean the SARJ. -- DOSTEL: On-going science acquisition - nominal;-- EuTEMP: Currently inactive as planned;-- EVC: on 11/20, the instrument was within temperature limits to be re-activated, but due to a problem of High-Data Downlink

no acquisition was made.-- EXPOSE: On-going science acquisition - nominal;-- FIPEX: Next script will run after the ULF2 EVAs are completed. Test of the atomic oxygen sensors has been performed on 11/25;-- MEDET: On-going science acquisition - nominal; -- PLEGPAY: Inactive, “Experiment 1” memory has been erased on 10/30. Plasma generation capability has been disabled;-- TRIBOLAB: On 11/18 and 11/20, the instrument transitioned to non-nominal mode (NNM). Anomaly with the TRIBOLAB Ball Bearing experiment shaft motor, currently being analyzed, unfortunately it does not look good.

FSL (Fluid Science Laboratory): FSL is nominal.

GEOFLOW: Additional MMA (Microgravity Measurement Apparatus) measurements will be acquired during ULF-2 undocking, and during 31P docking (TBC). It is planned to resume the GEOFLOW science runs after 31P docking. Ground infrastructure at MARS USOC will be upgraded to support GEOFLOW science acquisition as of Week 7.

HDTV System Test DL (JAXA): Complete.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: “Sandra, thank you for your diligence in collecting your saliva samples for the Integrated Immune experiment. The data you are collecting falls in the middle of the experiments life, and therefore is critical in determining the significance of space flight altered immune function. The blood draw was on 11/27, fulfilling the other half of the data requirement and completing this immune session.”

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): In progress.

Marangoni Experiment for ISS in JAXA FPEF (Fluid Physics Experiment Facility): In progress.

Micro-G Clay (JAXA EPO): Complete.

MISSE (Materials ISS Experiment): Ongoing.

Moon Photography from ISS (JAXA EPO): Complete.

MOP (Motion Perception in Zero-G): Three ULF-2 astronauts have participated in this experiment (daily questionnaires)

MSG-SAME (Microgravity Science Glovebox): Complete.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MUSCLE-G (LBP/Low Back Pain): Six ULF2 astronauts have participating in this experiment (daily questionnaires)

NOA-1/-2 (Nitric Oxide Analyzer, ESA): Complete.

NUTRITION w/REPOSITORY: In progress.

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PCRF (Protein Crystallization Research Facility) Reconfiguration (JAXA): Complete.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): The new Fluid Modules are now on-orbit. SHERE should be ready to begin flight operations after the first week of December.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): In progress.

SOLAR (Solar Monitoring Observatory): The Sun visibility window started on 11/21. Some anomalies are currently being worked for SOLACES and SOVIM instruments. A software patch was successfully uploaded on 11/20 and SOLAR is now running version 4.7 and is in Pointing Mode. The new SOLAR software release is currently loaded on the RAM memory, and it will be transferred to the

SOLAR Flash Disk on 12/4. The current Sun observation window is planned to finish on 12/2. Several observation orbits (total: 22) had to be skipped during the ULF-2 mission, due to SARJ clean-up activities and STS water dumps.-- SOVIM: No science acquisition, non-nominal mode: instrument power consumption was much lower than expected in nominal mode. Trouble-shooting activities were performed on 11/11 and these were not successful. Ground teams are analyzing the data, before next attempts are planned. -- SOLSPEC: on-going science acquisition;-- SOLACES: on-going science acquisition.

SOLO (Sodium Loading in Microgravity): Blood and urine samples from Greg Chamitoff are being returned with ULF-2.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): Reserve.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): New passive items have been launched with Progress 31P to prepare the next WAICO run.

CEO (Crew Earth Observations): "There won't be any CEO inputs until 12/1. We stand down from CEO ops and assist with shuttle imagery tasks during shuttle missions."

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 8:01am EST [= epoch]):
Mean altitude -- 354.2 km
Apogee height -- 358.9 km
Perigee height -- 349.6 km
Period -- 91.62 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006898
Solar Beta Angle -- -9.8 deg (magnitude increasing)

Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours – 155 m
Revolutions since FGB/Zarya launch (Nov. 98) – 57454.

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
11/30/08 -- STS-126/Endeavour/ULF-2 landing (nom. KSC, ~1:19pm; KSC/2nd: 2:55pm; EDW/1st: 4:24pm; EDW/2nd: 5:59pm.);
11/30/08 -- Progress M-01M/31P docking – DC1 Nadir (~7:23am)
12/07/08 -- Progress M-65/30P reentry (after 3 weeks autonomous flight for geophysical experiments)
12/17/08 -- Progress M-01M/31P thruster firing (test with Soyuz docked at SM aft);
12/18/08 -- Russian EVA-21
02/09/09 -- Progress M-01M/31P undocking & deorbit
02/10/09 -- Progress 32P launch
02/12/09 -- Progress 32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress 32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Endeavour/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/28/08
Date:	Friday, November 28, 2008 12:38:33 PM
Attachments:	

ISS On-Orbit Status 11/28/08

All ISS systems continue to function nominally, except those noted previously or below. *Flight Day 15 (FD15) of STS-126/ULF-2. ISS crew work cycle today: Wake 5:55am EST; sleep 8:00pm.*

ISS and STS-126/Endeavour are flying in separate orbits again.

After final departure preparations on both sides of the hatches (closed yesterday on ISS side at ~6:00pm EST), Endeavour undocked this morning at 9:47am from PMA-2 (Pressurized Mating Adapter 2) after a total docked time of 11d 16h 46m. *[For undocking, the station was turned at ~8:30am from -XVV through ~180 deg to +XVV ZLV (+x-axis in velocity vector, z-axis in local vertical, i.e., flying Shuttle in front again), put briefly on free drift for the undocking and then moded to ULF-2 Stage attitude of +XVV TEA (Torque Equilibrium Attitude).]*

Undocking was ~2 min prior to midnight, to ensure good lighting during the subsequent flyaround (sunrise: ~10 min before flyaround start). After separation, Endeavour completed the 360-deg station flyaround and obtained photo/video imagery of the ISS. The first two separation burns were completed by 11:15am. *[Endeavour mass at undocking: 230,836 lbs (104,705 kg).]*

KSC landing is nominally expected on 11/30 (Sunday) at ~1:19pm EST. *[If the landing occurs as planned, ULF-2 mission duration will be 15d 17h 24m. Gregory Chamitoff's total time in space will be 182d 21h 17m (178d 20h 45m on board ISS).]*

FE-1 Lonchakov performed the periodic maintenance of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The process will be terminated at ~7:45pm EST and Bed #2 regeneration performed tomorrow. (Last time done: 11/7-8). *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle is normally done every 20 days.]*

Before and during the Orbiter undocking, CDR Fincke stood by at the Cupola RWS (Robotics Workstation) A31p laptop with a stopwatch to monitor the proper performance of automatic undocking software for the PMA-2 departure under Russian thruster attitude control. Later, the CDR powered down the laptop. *[The procedure provides for the crewmember to take over the automatic operational attitude control sequence manually if the software does not resume control after the period of free drift a few minutes after physical separation. Free drift is employed to prevent a conflict between the control systems of the two vehicles (ISS & Shuttle) and to "limp" (unload) the docking mechanisms.]*

FE-2 Sandra Magnus used the Kodak DCS760 digital camera and PD-100 camcorder to document the undocking, backing away & separation of the Endeavour.

After the undocking, Fincke depressurized the PMA-2 to prevent humidity condensation and pressure fluctuations. Leak checking followed for the standard one hour. Afterwards, the necessary testing equipment was torn down.

Mike also deconfigured the BPSMU (Battery Powered Speaker Microphone Unit) and its long drag-through cable, used during the docked phase, and stowed the equipment.

FE-1 Lonchakov completed the reconfiguration of the Russian telephone/telegraph subsystem (STTS) to its post-undocking settings, from its primary string back to nominal mode on the backup string. This also severed the VHS (UHF) channel to the receding Shuttle Orbiter and restored the RSA-2 S/G (Space-to-Ground) comm configuration on Panel 3. *[The "Voskhod-M" STTS enables telephone communications between the SM, FGB, DC1 Docking Compartment and U.S. segment (USOS), and also with users on the ground over VHF channels selected by an operator at an SM comm panel, via STTS antennas on the SM's outside. There are six comm panels in the SM with pushbuttons for accessing any of three audio channels, plus an intercom channel. Other modes of the STTS include telegraphy (teletype), EVA voice, emergency alarms, Packet/Email, and TORU docking support.]*

While Mike & Sandy were busy with the undocking, Yuri performed a number of maintenance job, starting with a ventilation efficiency test on two (of eight) molybdenum 800A battery boxes (A107, A108) in the SM (Service Module). *[The measurements of temperature (degC) and air flow rate (m/sec) were taken with the TTM-2 heat-loss anemometer/thermometer instrument of the Russian KPT-2 science payload BAR-RM, after it was freshly charged and calibrated.]*

Lonchakov also performed scheduled IFM (in-flight maintenance) on the SM's condensate water processor (SRV-K2M) by removing & replacing its water-conditioning unit purification columns (BK BKV) with a new spare (#601011). The old unit was stowed for disposal on Progress 31P. (Last time done: 8/6). *[The SRV-K2M, with its BKO multifiltration unit, converts collected condensate into drinking water by removing dissolved mineral and organic impurities from the condensate. Downstream from it the condensate water is treated in the BKV water conditioning unit with salts for taste and silver ions for preservation, before it flows to the KPV potable water container from which the reclaimed water is dispensed warm or hot for drinking and preparation of food and beverages.]*

Sandy Magnus, the new FE-2, performed the periodic status check on the CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) payload, located in the ER-2 (EXPRESS Rack 2).

In the SM, Yuri conducted the routine daily servicing of the SOZh system (ECLSS/ Environment Control & Life Support System). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

The FE-1 also completed the daily IMS (Inventory Management System) maintenance, updating/editing the standard IMS "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Working from his discretionary "as time permits" task list, Yuri performed a session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program, using the NIKON D2X digital camera to take telephotos. *[Uplinked target zones were the southern & northern ice fields of Patagonia, glaciers sliding into Chilean fiords from the main ice plateau, the Falkland oceanic current, the Andes, and glaciers in New Zealand.]*

Yuri's voluntary task list also suggested another ECON KPT-3 session, making observations and taking aerial photography of Pacific Ocean surface contaminations for Russia's Environmental Safety Agency (ECON) using the D2X with SIGMA 300-800mm telephoto lens.

As a third item on the discretionary job list, Lonchakov repeated the initialization of the long-term BIO-5 Rasteniya-1 ("Plants-1") experiment, which had failed on 11/18. Afterwards, Yuri was to assure himself of the operation of the BU Control Unit and MIS-LADA Module fans (testing their air flow by hand). *[Rasteniya-1*

researches growth and development of plants under spaceflight conditions in the LADA-14 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). The payload hardware includes a module (MIS/Module for the Investigation of Substrates), the MIS control unit (BU), a nitrogen purge unit (BPA) and other accessories. During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. LADA consists of a wall-mounted growth chamber that provides long-term, ready access for crewmember interaction. It provides light and root zone control but relies on the cabin environmental control systems for humidity, gas composition, and temperature control. Cabin air is pulled into the leaf chamber, flows over the plants and vents through the light bank to provide both plant gas exchange and light bank cooling.]

At ~1:00pm, MCC-Houston will be remotely downloading the structural dynamics measurements of the Shuttle undocking by the IWIS (Internal Wireless Instrumentation System) from the SSC-4 (Station Support Computer 4), then reprogram the IWIS for the Progress 31P docking on Sunday. *[The crew was advised to "be hands off" of SSC-4 during this time.]*

The ISS crew completed their physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (FE-1).

ISS Crew Sleep Shift Planning: To synchronize the ISS crew's timeline with STS-126/ULF-2 undocking tomorrow, ISS crew wake/sleep cycle is undergoing a number of one-hour shifts which started on 11/25. The early undock time this morning (9:47am) drove crew wakeup 2.5 hrs earlier, to ~7:00am. For the next four days, the wake/sleep shift schedule is as follows, returning to "normal" on 12/1 (all times EST):

11/28	Wake: 5:55am – 8:00pm
11/29	Wake: 4:30am – 6:00pm
11/30	Wake: 2:30am – 4:30pm
12/01	Wake: 1:00am – 4:30pm

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

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Perigee height -- 349.8 km
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Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006852
Solar Beta Angle -- -5.2 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.71
Mean altitude loss in the last 24 hours – 23 m
Revolutions since FGB/Zarya launch (Nov. 98) – 57438.

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
11/30/08 -- STS-126/Endeavour/ULF-2 landing (KSC, ~1:19pm);
11/30/08 -- Progress M-01M/31P docking – DC1 Nadir (~7:23am)
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12/17/08 -- Progress M-01M/31P thruster firing (test with Soyuz docked at SM aft);
12/18/08 -- Russian EVA-21
02/09/09 -- Progress M-01M/31P undocking & deorbit
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Six-person crew on ISS
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
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12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/27/08
Date:	Thursday, November 27, 2008 3:00:15 PM
Attachments:	image001.gif

ISS On-Orbit Status 11/27/08

All ISS systems continue to function nominally, except those noted previously or below. *Flight Day 14 (FD14) of STS-126/ULF-2. ISS crew work cycle today: Wake 6:55am EST; sleep 9:25am; Shuttle crew: 10:55am (both until 5:55am tomorrow, i.e., one hour earlier).*

The ISS and Shuttle crews have a well-deserved half day off, and they will enjoy a Thanksgiving meal together.

For the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function), FE-2 Chamitoff and FE-2-18 Magnus conducted their final Liquid Saliva collections in the morning, and later Steve Bowen came over to draw a blood sample from Sandra. The Saliva Return Pouches and Blood Sleeves were then stored at ambient temperature on the Shuttle Middeck for return to ground. *[IMMUNE protocol requires the collection to occur first thing post-sleep, before eating, drinking and brushing teeth, and all samples are stored at ambient temperature. Along with NUTRITION (Nutritional Status Assessment), INTEGRATED IMMUNE samples & analyzes participant's blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects.]*

CDR Fincke performed another periodic relocation of the TEPC (Tissue Equivalent Proportional Counter) detector assembly, the primary radiation measurement tool in the ISS, today from the Node-2 (loc. PD3/2) back to the

Service Module (SM), Panel 327, and connected the IVCPD (Intravehicular Charged Particle Directional Spectrometer/TEPC power/data cable to the CHeCS UOP5 (Crew Health Care Systems/Utility Outlet Panel 5) on Panel 450. *[TEPC had been moved to the Node-2 by Mike on 11/10, after having been in the SM from 9/30.]*

Later today, Sandy Magnus & Greg Chamitoff have an hour set aside to (carefully!) remove frozen science samples from the MELFI and stow them in two DCBs (Double Cold Bags), then moved them to the Shuttle Middeck for return to Earth.

With all planned WRS (Water Recovery System) water samples collected & safely stowed aboard Endeavour, Mike Fincke will reconfigure the compressor power feed for transferring liquid waste to the UPA (Urine Processing Assembly, disconnecting it at ER2 (EXPRESS Rack 2) and reconnecting it at the ER6/Galley rack (thus removing the cable that was stretched across the Lab).

Afterwards, the CDR will perform another set of thorough leak checks of the WPA (Water Processing Assembly) in the WRS Rack, then take an atmospheric sample in the center of the Lab with the U.S. GSC (Grab Sample Container), using GSCs #1050, for return to the ground.

Preparatory to hatch closure tonight, the Shuttle crewmembers are finishing up the transfers of their EMU/spacesuits and other return cargo to the Shuttle middeck. *[At wake-up this morning, 96% of transfers were complete, with approximately 3.25 hrs remaining for middeck transfers.]*

CDR Ferguson & CDR Fincke will tear down and remove the oxygen transfer system which was used to pump O_2 over from the Shuttle to the ISS. MCC-Houston will then reconfigure the A/L CCAA (Airlock Common Cabin Air Assembly). *[About 25 lbs O_2 were transferred to the A/L HPTs (High Pressure Tanks). Another ~20 lbs was used for repressurizing the ISS cabin atmosphere.]*

Chris Ferguson also will transfer SSC (Station Support Computer) equipment to the ISS, including an AFD PCS (Portable Computer System), three A31p 60 GB HDDs (Hard Disk Drives), an A31p Ultraport camera, and a Wireless Network Card.

In the Kibo JPM (Japanese Pressurized Module), Sandy Magnus will set up the SCOF (Solution Crystallization Observation Facility) for the ICE CRYSTAL (The Study on Microgravity Effect for Pattern Formation of Dendritic Crystal by a Method of in-situ Observation) payload, the first of the JAXA Increment 18 experiments. *[ICE CRYSTAL evaluates the factors that lead to pattern formation in ice crystals in microgravity.]*

At ~3:26pm, PLT Boe & MS4 Kimbrough are scheduled to maneuver the SRMS (Shuttle Remote Manipulator System) with the OBSS (Orbiter Boom Sensor System) to undock position. *[After undocking and before entry on Sunday, the OBSS will be used for another inspection of the Orbiter TPS (Thermal Protection System).]*

The traditional **Crew Farewell** ceremony is timelined for ~5:55pm EST, followed by air duct removal and hatch closure ("Weigh Anchor! Set Sail!") at ~6:00pm, handled on the ISS side by Fincke & Magnus, on the Orbiter side by Kimbrough & Stefanyshyn-Piper. *[Afterwards (~6:04pm), Chris switches attitude control authority of the mated stack from ISS CMG TA (Control Moment Gyroscope Thruster Assist) mode to Orbiter ORB control and, Heidemarie & Shane will initiate the standard one-hour leak check on the ODS (Orbiter Docking System). Preparatory to the ODS depress venting, Mike has closed the protective window shutters in the JPM earlier today.]*

Endeavour is scheduled to **undock** from ISS tomorrow morning at 9:47am, in local darkness, followed by the standard flyaround in daylight, for a total docked time of 11d 16h 46m (13d 13h 52m in space). After a one-orbit flyaround for photo imaging at 400-600 ft, first separation burn of Endeavour will be at ~11:03am, the second at ~11:30am and the third at ~12:15pm. Landing is set for Sunday, 11/30, nominally at KSC at 1:18pm EST. If so, total mission duration for STS-126/ULF-2 will have been 15d 17h 23m. Gregory Chamitoff's total time in space will be 182d 21h 16m, with 178d 20h 44m on board ISS.

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11/28	Wake: 5:55am – 8:00pam
11/29	Wake: 4:30am – 6:00pm
11/30	Wake: 2:30am – 4:30pm
12/01	Wake: 1:00am – 4:30pm

12/02	Wake: 1:00am – 4:30pm

No CEO photo targets uplinked for today.

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04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

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HAPPY THANKSGIVING!

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/26/08
Date:	Wednesday, November 26, 2008 2:56:00 PM
Attachments:	

ISS On-Orbit Status 11/26/08

All ISS systems continue to function nominally, except those noted previously or below. *Flight Day 13 (FD13) of STS-126/ULF-2. ISS crew work cycle today: Wake 7:55am EST; sleep 10:25am; Shuttle crew: 10:55am (both until 6:55am tomorrow, i.e., one hour earlier).*

Progress M-01M/31P (No. 401) launched on time this morning at Baikonur at 7:38 am EST. Ascent was nominal and the vehicle reached orbital insertion at 7:47:23am. All appendages (antennae & solar arrays) deployed nominally except for one of the KURS-A antennas (2ASF1-M-VKA) for narrow-field proximity ranging, range rate updates & angles measurement, which remained retracted until it was successfully deployed on DO3 (Daily Orbit 3) by direct ground commanding during RGS (Russian Groundsite) pass. *[The 7288-kg mass cargo ship will deliver 2676 kg of various supplies to the ISS, including 28 kg oxygen, 21 kg air, 185 kg water, 296 kg food, 1120 kg propellant (for ISS needs), 321 kg US items, 171 kg sanitary & hygienic items, 19 kg fire-protection items, 133 kg medical items, 103 kg utilization/science payloads and various equipment. 31P is the first of an upgraded version of the cargo ship, equipped with a new state-of-the art digital computer system and more-compact radiotelemetry avionics. The new equipment allows automatic diagnostics for the comm paths between telemetry system & computer system elements and provides digital interfaces for integrating all the spacecraft systems into the ISS. It has 165 lbs less dry mass than previous Progress vehicles, allowing more cargo, and has 15 fewer parts. Note: Soyuz & Progress flights are supported by (currently) 11 RGS stations: five connected to TsUP-Moscow by fiber-optic land line, four by the "Primyorka" geostationary satellite, and two in autonomous mode. Real-time commanding is normally performed directly by the RGS sites, with voice link to/from TsUP. There is also a tracking ship, "Cosmonaut Posayev" (KVP 47), in the port of Kaliningrad.]*

UPA Update: The UPA (Urine Processing Assembly) has been performing nominally. After its first flawless run for the planned 5 hrs, the UPA, which works with an advanced technique called Vapor Compression Distillation (VCD), was

nominally shut down late on 11/24. This was followed by a 3-hr cool-down cycle and a reactivation for a second successful run of 4.25 hrs, with nominal shutdown. Yesterday, the UPA ran again for another 7 hrs, performing nominally. A fourth run was then completed overnight, the last planned run for the docked mission. *[UPA startup was delayed briefly for this last run due to a sticky check valve in the MTL (Moderate Temperature Loop). After being fully seated, UPA ran fine.]*

WPA Update: All WPA (Water Processing Assembly) operations to date have been nominal. The third WPA processing activity was initiated on 11/24 for a successful overnight run. Today, Sandra Magnus & Mike Fincke are offloading the processed water from the WPA to a CWC (Contingency Water Container, #1018), collecting a sample and then draining the accumulator. A fourth run (to process at least 13 lbs of distillate or condensate) will then be initiated by the ground, and another sample taken after its completion. If time allows, Sandy will subject the sample to inflight microbiology analysis using the MCDs (microbial capture devices) of the WMK (water microbiology kit).

TOCA Update: Yesterday, a software patch was uplinked to the TOCA (Total Organic Carbon Assembly). While working to initiate another run, Sandy Magnus found a small leak at the GLS (Gas/Liquid Separator). The GLS was removed & replaced (R&R'd) with one of three on-orbit spares, which fixed the leak. The failed GLS will be returned. It will be used by the crew to process WPA & PWD samples (can be deferred to post-undock). *[Also being considered is an R&R of the TOCA oxidizer which may be faulty (based on its current reading during calibration on 11/21), but not before ULF-2 undocking due to crew time constraints. There are four spares onboard.]*

PWD Update: Yesterday, Magnus first vented, then filled the PWB (Potable Water Bus). Sandy then activated the PWD (Potable Water Dispenser), flushed it with potable water, and followed with an ambient water flush. Samples are being obtained today for return on the Shuttle Middeck as well as for WMK analysis and TOCA processing.

SARJ Update: After the extensive cleaning & lubricating work on the ULF-2 spacewalks, the Stbd SARJ (Solar Alpha Rotary Joint) was rotated through 720 deg (two rotations) in Autotrack mode for the first time in over a year to measure mechanical resistance in the motor current. The rotation required significantly less energy than before, as indicated by the motor current which averaged 0.17A (amperes), with a peak of 0.35 A (pre-repair current draws: 0.7-0.9A; begin of service life: 0.15A). The Stbd SARJ also showed negligible vibration during rotation. It was returned to Directed Position later in the day. The Port SARJ, which also was lubricated, as a precautionary measure, and had performed well, was returned to Autotrack.

FE-2-18 Magnus continued her first session with the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function), today collecting dry saliva samples throughout the day (five 1-min collections). *[IMMUNE protocol requires the collection to occur first thing post-sleep, before eating, drinking and brushing teeth, and all samples are stored at ambient temperature. Along with NUTRITION (Nutritional Status Assessment), INTEGRATED IMMUNE samples & analyzes participant's blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected at intervals during the collection day using a specialized book that contains filter paper. The liquid saliva collections require that the crewmember soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations.]*

In preparation for Progress M-01M/31P docking on 11/30 (Sunday), CDR Fincke & FE-1 Lonchakov completed the standard three-hour training course with the TORU teleoperator system which provides a manual backup mode to the Progress' KURS automated rendezvous radar system. Afterwards, Mike & Yuri tagged up with a TORU instructor at TsUP/Moscow via S-band audio. *[The drill included procedure review, rendezvous, docking data and rendezvous math modeling data review, fly-around, final approach, docking and off-nominal situations (e.g., video or comm loss). Three modes were simulated on the RSK1 laptop: two with 31P from stationkeeping range (~150 m) in sunlight (insolation), and 31P in final approach (from 50 m) in darkness (eclipse). The TORU teleoperator control system lets a SM-based crewmember perform the approach and docking of automated Progress vehicles in case of KURS failure. Receiving a video image of the approaching ISS, as seen from a Progress-mounted docking television camera ("Klest"), on a color monitor ("Simvol-Ts", i.e. "symbol center") which also displays an overlay of rendezvous data from the onboard digital computer, the CDR would steer the Progress to mechanical contact by means of two hand controllers, one for rotation (RUO), the other for translation (RUD), on adjustable armrests. The controller-generated commands are transmitted from the SM's TORU control panel to the Progress via VHF radio. In addition to the Simvol-Ts color monitor, range, range rate (approach velocity) and relative angular position data are displayed on the "Klest-M" video monitor (VKU) which starts picking up signals from Progress when it is still approximately 8 km away. TORU is monitored in real time from TsUP over Russian ground sites (RGS) and via Ku-band from Houston, but its control cannot be taken over from the ground. On 11/30, Progress KURS will be activated at ~5:39am EST on Daily Orbit 1 (DO1), SM KURS two minutes later. S-band (UKV-*

2) radar will be switched on at a range of ~9 km, Progress headlight & video at ~8 km. Flyaround to the SM aft docking port (~400 m range, in sunlight) starts at 6:51am. Start of final approach: ~7:15 (DO2) in sunlight, contact: ~7:23am (in darkness).]

CDR Ferguson & MS1 Pettit meanwhile began the series of steps necessary to close out and lock up the MPLM (Multipurpose Logistics Module) for tomorrow's transfer to the Endeavour cargo bay with MPLM egress, first removing the PFE (Portable Fire Extinguisher) and PBA (Portable Breathing Apparatus) from "Leonardo" and stowing them in Node-1 & Node-2.

Next, the MPLM was deactivated, all jumpers & ducting removed and thermal covers re-installed, followed by installation of the CBM (Common Berthing Mechanism) center disk cover to restore thermal & meteoroid debris protection to the Node-2 radial (nadir) port, using a modified approach to avoid damage to CBM CPA (Controller Panel Assembly) connectors.

After Chris and Don have closed hatches, FE-2 Chamitoff will depressurize the MPLM/Node-2 vestibule for a 30-min leak check.

Later in the day, FE-2-18 Magnus & MS4 Kimbrough will support the ground in demating the Node-2 CBM by removing CBM bolts and deploying latches.

At ~4:45pm, Pettit & Kimbrough will grapple the MPLM with the SSRMS (Space Station Remote Maneuvering System), then unberth it and transfer it to the Shuttle (~5:30pm) for re-berthing in its cargo bay.

FE-2 Chamitoff returned the VCA1 (Video Camera Assembly 1) to its place in the COL (Columbus Orbital Module) and installed it on the seat track at Port Endcone/ Aft side.

CDR Ferguson configured the oxygen transfer gear between the Orbiter and ISS and initiated another transfer of O_2 to the HPTs (High-Pressure Tanks) mounted on the U.S. Airlock (A/L). The transfer equipment will be torn down tomorrow.

Gregory & Sandy had more time reserved for standard joint "handover" activities, to be continued through the docked period ahead. Today this activity included a familiarization with DCB (Double Cold Bag) packing procedures preparatory to tomorrow's transfer of critical samples to the Shuttle Middeck prior to hatch closure (~6:10pm).

MS3 Stefanyshyn-Piper & FE-2-18 Magnus have several hours set aside for

restowing EVA tools in the A/L.

Meanwhile, the Shuttle crew is scheduled to transfer their EMU/spacesuits to the Shuttle, along with remaining Middeck equipment.

Mike Fincke spent some time in the Kibo JPM (Japanese Pressurized Module) to take documentary photography. *[Objects of interest were a recently installed ZSR (Zero-G Stowage Rack) to confirm that there is no interference between it and heaters/harnesses in JPM, and the rear of a second ZSR plus stowage arrangement behind hard dummy panels.]*

Later tonight, Yuri Lonchakov will conduct the routine maintenance of the SOZh/ ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier].*

Also on Yuri's schedule for today was the periodic (currently daily) checkout/ verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the passageways PrK (SM Transfer Compartment)–PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1. *[This checkup is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).]*

Additionally, the FE-1 will complete the periodic daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Greg Chamitoff again had 1:15h to himself for the regular crew departure preparations, working on the standard end-of-increment cleanup preparatory to his return to Earth later this month. *[It is usual for crewmembers to be granted reduced workdays for making their departure preparations, as their return date approaches.]*

The ISS crew completed their physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2-18), TVIS treadmill (CDR, FE-1, FE-2), RED (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

VolSci Look-ahead: For this weekend's VolSci (Voluntary Science) program, Mike & Sandy were asked to consider two options at their choice: (1) a LOCAD-PTS (Lab-On-A-Chip Application Development – Portable Test System) surface sampling session in COL using Glucan LAL cartridges, targeting fungus on ISS surfaces; and (2), for Sandy (assisted by Mike), a session with the CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS) experiment which studies the effects of long-duration spaceflight on crewmembers' heart functions and their blood vessels that supply the brain.

ISS Crew Sleep Shift Planning: To synchronize the ISS crew's timeline with STS-126/ULF-2 undocking, ISS crew wake/sleep cycle is again undergoing a number of shifts which started on 11/25. The early undock time (9:47am) drives crew wakeup 2.5 hrs earlier, to 7:00am by FD14. For the next six days, the wake/sleep shift schedule is as follows (all times EST):

11/26	Wake: 7:55am –10:25pm
11/27	Wake: 6:55am – 9:25pm
11/28	Wake: 5:55am – 8:00pam
11/29	Wake: 4:30am – 6:00pm
11/30	Wake: 2:30am – 4:30pm
12/01	Wake: 1:00am – 4:30pm
12/02	Wake: 1:00am – 4:30pm

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 8:13am EST [= epoch]):
Mean altitude -- 354.4 km
Apogee height -- 359.1 km
Perigee height -- 349.7 km
Period -- 91.63 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007009
Solar Beta Angle -- 3.7 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.71
Mean altitude gain in the last 24 hours – 250 m
Revolutions since FGB/Zarya launch (Nov. 98) – 57407.

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

11/28/08 -- STS-126/Endeavour/ULF-2 undocking (~9:47am);
11/30/08 -- STS-126/Endeavour/ULF-2 landing (KSC, ~1:18pm);
11/30/08 -- Progress M-66/31P docking – DC1 Nadir (~7:23am)
12/07/08 -- Progress M-65/30P reentry (after 3 weeks autonomous flight for geophysical experiments)
12/18/08 -- Russian EVA-21
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Endeavour/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/25/08
Date:	Tuesday, November 25, 2008 2:31:28 PM
Attachments:	

ISS On-Orbit Status 11/25/08

All ISS systems continue to function nominally, except those noted previously or below. *Flight Day 12 (FD12) of STS-126/ULF-2. ISS crew work cycle today: Wake 8:55am EST; sleep 11:25am; Shuttle crew: 11:55am (both until 7:55am tomorrow, i.e., one hour earlier).*

Mission ULF-2's **EVA-4 was completed successfully** last night by Steve Bowen & Shane Kimbrough in 6h 7min, accomplishing all of its objectives.
[During the spacewalk, (EV2) & Kimbrough (EV3) –

- *Completed Stbd SARJ (Solar Alpha Rotary Joint) maintenance: cleaning, lubricating & installing the final TBA (Trundle Bearing Assembly) #3 (deferred from EVA-3);*
- *Installed MLI (Multi-Layer Insulation) Covers 17 & 18 (deferred from EVA-3);*
- *Lubricated the Port SARJ as preventive maintenance;*
- *Installed an ETVCG (External TV Camera Group) camera at CP-7 (Camera Position 7) on the S0/P1 truss interface (2 of 3 bolts engaged); camera is required for JAXA HTV (H-II Transfer Vehicle) berthing in Sept. 2009;*
- *Manually Retracted Structural Latch 1 of the JAXA EFBM (External Facility Berthing Mechanism); completion confirmed by Fincke from unlit LED (Light Emitting Diodes) on internal BCDU (Berthing Mechanism Control & Driver Unit);*
- *Re-installed EFBM center cover after EVA-1 temporary stow; and*
- *Installed GPS (Global Positioning System) Antenna A on Kibo JPM (JEM Pressurized Module).*

The EVA, originally planned for 6:30h, was cut short by 23 min, again due to elevated CO_2 (carbon dioxide) level (3.99 mmHg) in Shane Kimbrough's EMU. Not completed were:

- *Installation of JEM GPS Antenna B;*
- *Infrared imagery of S1 Radiator & P1 Radiator (get-aheads).*

Official start time of the spacewalk was 1:24pm EST, and it ended at 7:31m. Total

EVA duration (PET = Phase Elapsed Time) was 6h 7min. It was the 118th spacewalk for ISS assembly & maintenance and the 90th from the station (66 from Quest, 24 from Pirs, plus 28 from Shuttle) totaling 557h 07m, the fourth EVA for Expedition 18 and the 18th so far this year (including two Russian Orlan EVAs). It was the third spacewalk for Bowen (19h 56m tot.) and the second for Kimbrough (12h 52m tot.). After today's EVA, a total of 157 spacewalkers (121 NASA astronauts, 25 Russians, and 11 astronauts representing Japan-1, Canada-4, France-1, Germany-2 and Sweden-3) have logged 745h 29min outside the station on building, outfitting & servicing. It was the 138th spacewalk involving U.S. astronauts.

After the spacewalkers' ingress (7:31pm EST), post-EVA activities by MS4 Kimbrough, MS2 Bowen, FE-2 Chamitoff, CDR Fincke & CDR Ferguson in the A/L consisted of --

- Recharging the EMU/spacesuits with water from PWR (Payload Water Reservoir),
- Reconnecting the LTAs (Lower Torso Assemblies) to the EMUs
- Capping the UIA (Umbilical Interface Assembly,
- Initiating battery charging in the A/L BSA (Battery Stowage Assembly),
- Taking photographs of the EMU gloves for downlink and inspection,
- Downlinking EVA photography.

Today, Shuttle crewmembers Bowen, Kimbrough and Stefanyshyn-Piper are working on reconfiguring the EMUs (Extravehicular Mobility Units) and other EVA equipment/tools for transfer to the MPLM and the Middeck.

FE-2-18 Sandra Magnus photographed and labeled the returned GPS-B antenna and stowed it in a bag in the JPM. *[The GPS B antenna will be installed on the JPM during a future EVA. Both antennas are required for HTV docking in Sept. 2009.]*

WRS/WPA (Water Recovery System/Water Processing Assembly) Update: CDR Fincke is continuing to work on the WRS/WPA which has been operating nominally since yesterday (two nominal runs over four hours each). *[After re-filling the UPA (Urine Processing Assembly) with EDV-pretreated urine, Mike checked again today for leaks. Later, he will collect water samples of the WPA's second run (one purge bag, one post-flight analysis packet, one TOCA sample), before transferring the recycled water from the WPA to CWCs (Contingency Water Containers, #1017 & 1018) with iodine, using a common H_2O hose, conduct an in-flight chemistry/ microbiology analysis of a sample with the U.S. WMK (water microbiology kit), then temporarily stow the equipment. <u>Background</u>: Two additional fasteners were installed yesterday on the WRS DA (Distillation Assembly) structural mounting*

plate, followed by retorquing of all DA fasteners. In addition, Fincke & Pettit installed an IWIS RSU (Internal Wireless Instrumentation System/Remote Sensor Unit) to obtain structural vibrational data from the activated UPA (required for subsequent engineering analysis and assessment with respect to any impacts on micro-G science payloads and other station systems). The UPA is running continuously today, and at one time reportedly generated a "washing machine" noise, as expected due to the hard (undampened) mounting. If no further anomalies occur until 3:00pm EST today (cutoff for MPLM stowage), there is no need for the DA to return to Earth.]

The TOCA (Total Organic Carbon Analyzer) is operating nominally after yesterday's troubleshooting (removal of trapped air bubbles by flushing a re-circulating section of the liquid pump via "dead-heading"). A sample from the WRS was obtained and successfully run through the TOCA, followed by data downlink to MCC-Houston for analysis. A second sample is being analyzed today.

FE-2-18 Sandra Magnus is completing the installation of the Galley's PWD (Potable Water Dispenser) standoff hose from the LAB1S7 rack location along the LAB1P4 & LAB1O4 racks. *[The work includes taking documentary photography of the installation, followed by activation & checkout of the hose, first flushing it from an iodine-treated CWC (#1059), followed by vacuum-backfilling and then using about 2 L of ambient water (~2 L) for flushing, in small increments (to gain flight data on WPA accumulator pressure range).]*

Greg Chamitoff & Don Pettit prepared the spare JEM CBM CPA-4 (Common Berthing Mechanism/Controller Panel Assembly 4) by carefully removing its MLI cover (there are two ground wires between MLI & CPA), then installed the spare at the Node-2 nadir CBM in place of the failed CPA-4. *[This allows MCC-Houston to prepare the Node-2 Nadir CBM during crew sleep for tomorrow's (11/26) MPLM demating.]*

Chamitoff and Magnus had more time reserved for standard joint "handover" activities, to be continued through the docked period ahead.

FE-1 Lonchakov started a new round of the periodic preventive maintenance of RS (Russian Segment) ventilation systems in the FGB (Funktsionalnyi-Grusovoi Blok), cleaning the grille of the TsV1 fan.

Afterwards, the FE-1 worked his way through an extensive five-hour teardown of the Russian MATRYOSHKA-R (RBO-3-2) radiation suite in the SM (Service Module). *[Yuri dismantled the antroph-amorphous (human torso) "Phantom" and removed its PILLE radiation detectors, five NTDPs (Nuclear Track Detector Packages) and 356 TLDs (Thermoluminescent Detectors) from its torso layers. The*

detectors will then be pre-packed for return to Earth and handed over to the Shuttle crew, while the Matryoshka hardware is to be temporarily stowed in the FGB.]

Later tonight, Lonchakov will conduct the routine maintenance of the SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier].*

Also on Yuri's schedule for today is the periodic (currently daily) checkout/ verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the passageways PrK (SM Transfer Compartment)–PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1. *[This checkup is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).]*

As an addition to his discretionary "as time permits" task list for today, Yuri will complete the periodic daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The "scavenging" of MPLM (Multipurpose Logistics Module) GLAs (General Luminaire Assemblies) for use as spares on the ISS, deferred from yesterday's schedule, is one of Sandy's jobs today.

Afterwards, the FE-2-18 is to inspect the MPLM hatch seal for any possible damage following the rack translations of the preceding days.

Preparatory to today's scheduled combined waste water dump from the Shuttle, Mike Fincke verified closure of the protective window shutters in the Kibo JPM. Then, at ~11:20am, CDR Ferguson maneuvered the ISS/Shuttle stack into the proper attitude, and at ~11:38am the venting commenced (in retrograde direction). Later, –XVV attitude (Shuttle bottom facing opposite to flight direction for TPS protection) was restored with Shuttle thrusters (ORB mode) at ~1:05pm and taken over by CMG Momentum Management. *[The water vent (from Orbiter, CWC 1076 & PWR 1025) had been coordinated with Russian specialists who require a 5-day separation between the dump and the arrival of Progress 31P.]*

At ~5:05pm EST, the combined crew is scheduled for three PAO interviews with

KARE-TV, Minneapolis, MN (Diana Pierce, Pat Evans), KPAM-AM Radio, Portland, OR (Terry Travis) and WTXF-TV, Philadelphia, PA (Sabrina *Wolman).*

At ~9:22pm, CDR Fincke will power up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, & power supply) and conduct, at 9:27pm, a ham radio exchange with Wairarapa Home School Association, Carterton, Wairarapa, New Zealand. *[The Association is a support group for many of the Home Schoolers in the Wairarapa province located about 90 km Northeast on Highway 2 from the Capital City, Wellington. The organization provides a point of communication for events and resources that are in the Wairarapa and for parents to plan events that will provide for educational and social activities for our families. The Wairarapa in Maori means "sea of sparkling waters" from Lake Wairarapa, a fresh water lake in the province. It is a rural community consisting of dairying, cattle, sheep, timber, cropping and some fruit growing industries. Some families live in remote areas in the farming community and others live in the eight country towns; Masterton is the main town in the province. The children who will be asking the questions are schooled by their parents from a Correspondence curriculum, the ages of the children range from 5 to 14 years--many come from big families, where English is their first language. Questions to Mike were uplinked beforehand. "What made you want to be an astronaut?"; "How long do you go into space for, and what are you doing up there?"; "Have you gone outside the space station yet?"; "What can you see out the window?"; "What does the Milky Way and other planets look like from the space station?"; "Have you ever seen a shooting star, and what did it look like from the space station?"; "How do you exercise in space?"; "Is the cabin pressurized so you can eat food like we do on earth, or do you float around like they do on movies and have to drink pureed food?"; "What happens if there is a fire on the space station?"; "How do you handle it when two of you have an argument on the space station?"; "What is the operating system for your computers on board the space station?"]*

The ISS crew completed their physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-1, FE-2), TVIS treadmill (CDR, FE-2), RED (CDR, FE-2-18), and VELO bike with bungee cord load trainer (FE-1).

Transfers: MPLM (Multi-Purpose Logistics Module) cargo transfers are being completed today. Middeck transfers are on schedule. 22 lbs of O_2 (oxygen) was transferred from the Shuttle today. *[As of this morning, Middeck cargo transfers were 69% complete, MPLM 96%, total 89%.]*

No CEO photo targets uplinked for today.

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http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

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02/26/09 -- STS-119/Endeavour/15A landing (nominal)
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07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
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02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)

05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/24/08
Date:	Monday, November 24, 2008 2:25:36 PM
Attachments:	

ISS On-Orbit Status 11/24/08

All ISS systems continue to function nominally, except those noted previously or below. *Flight Day 11 (FD11) of STS-126/ULF-2. ISS crew work cycle today: Wake 8:55am EST; sleep 12:25am; Shuttle crew: 12:55am (both until 8:55am tomorrow). Underway: Week 5 of Increment 18.*

***Mission Extension**:* The IMMT (ISS Mission Management Team) and the Shuttle Program this morning approved an extension of the ULF-2 flight by one day (i.e., undocking on Friday, 11/28) to provide additional time for the WRS (Water Recovery System) and TOCA (Total Organic Carbon Analyzer) troubleshooting activities and increase the chances of returning adequate distillate samples to the ground (or return the UPA if required). Thus, MPLM "Leonardo" closeout & transfer to the Shuttle cargo bay will also slip a day. *[The extension will not interfere with the Progress 31P docking , scheduled for 11/30.]*

Mission ULF-2's EVA-4 is underway, having begun at 1:24pm EST (34 min behind schedule). The spacewalk is being performed by Steve Bowen (EV2) & Shane Kimbrough (EV3). *[EV2 & EV3 began their "campout" last night at ~11:20pm in the U.S. Airlock (A/L) with hatch closure and depressurization of the CL (Crewlock) from 14.7 to 10.2 psi, followed by mask prebreathe at ~11:20pm-12:25am. This morning, following the usual hygiene break/with mask prebreathe for the two spacewalkers at ~8:35am-9:45am after spending the night on 10.2 psi, the A/L hatch was closed again for EVA preps in 10.2 psi, followed by EMU (Extravehicular Mobility Unit) purge and prebreathe in the EMUs, assisted by Chris Ferguson and Sandra Magnus. Afterwards, with CL depressurization and EV2/EV3 egress, EVA-4 began at 1:24pm, with Eric Boe providing IVA (Intravehicular Activity) assist.]*

EVA-4 is expected to last about 6:30h (i.e., until ~7:54pm EST). Spacewalk objectives are –-
- for EV2/Bowen:

- Remove MLI (Multi-Layer Insulation) covers 11,10,7,6) on P3 truss,

- At Stbd SARJ (Solar Alpha Rotary Joint), clean & lube under covers 17/18; install TBA (Trundle Bearing Assembly)-3; install cover;
- EFBM (External Facility Berthing Mechanism) structural latch contingency;
- Install EFBM covers;
- Install 2 JEM (Japanese Experiment Module) GPS antennas (prep. for Japanese HTV arrival);
- Clean up JEM.

- for EV3/Kimbrough:

- Remove P3 MLI (Multi-Layer Insulation) covers 14 & 15;
- Port SARJ lube (Part 1);
- Install ETVCG at CP 7 ;
- Port SARJ, lube (Part 2);
- Install P3 MLI covers ;
- Get aheads : Infrared imagery of S1 Radiator & P1 Radiator.

The NOAX (Non-Oxide Adhesive Experimental) caulk applicator from the Shuttle, using Braycote-601 lubricant for the trundle bearings, was approved for use on EVA-4. *[The gun was left in the A/L for use if needed, with no modification to reduce Braycote flow from its nozzle.]*

After the spacewalkers' return on board tonight, post-EVA activities by MS3 Kimbrough, MS2 Bowen & FE-2-18 Magnus & CDR Ferguson in the A/L will consist of --

- Recharging the EMU/spacesuits with water from PWR (Payload Water Reservoir),
- Reconnecting the LTAs (Lower Torso Assemblies) to the EMUs
- Capping the UIA (Umbilical Interface Assembly,
- Initiating battery charging in the A/L BSA (Battery Stowage Assembly),
- Taking photographs of the EMU gloves for downlink and inspection,
- Downlinking EVA photography and the radiator infrared imagery.

Before breakfast, FE-2 Chamitoff & FE-2-18 Sandra Magnus continued their session with the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function), collecting a liquid saliva sample. *[IMMUNE protocol requires the collection to occur first thing post-sleep, before eating, drinking and brushing teeth, and all samples are stored at ambient temperature. Along with NUTRITION (Nutritional Status Assessment), INTEGRATED IMMUNE samples & analyzes participant's blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected*

at intervals during the collection day using a specialized book that contains filter paper. The liquid saliva collections require that the crewmember soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations.]

Fincke & Chamitoff are continuing troubleshooting activities on the WRS (Water Recovery System), today removing two more vibration isolators from the DA (Distillation Assembly) and installing two additional fasteners for hard mounting the DA on the WRS rack instead. *[After Mike Fincke & Don Pettit removed the first set of isolators yesterday and loaded pre-treated urine into the UPA (Urine Processing Assembly), the UPA ran nominally for 2:58h before shutting down again. Suspect is the rack isolation/dampening supports which probably cause an imbalance to the centrifuge, having never been tested before in zero-gravity (another Lesson Learned?). The crew is now removing additional vibration dampeners from the UPA mounting and will then reattempt UPA processing.]*

Afterwards, the WSTA will again be filled with EDV-pretreated urine (to no more than 65%), and Fincke will start the processing operation. *[For adequate sampling, a minimum of 61 lbs urine distillate is required, which takes at least 24 hrs to collect.]*

For today's troubleshooting of the new TOCA equipment, samples will be required from the WPA (Water Processor Assembly), collected in two bags. *[During the TOCA analysis of waste water samples from the WPA yesterday, the first two replications of the water analysis cycle were completed, but the analysis terminated during the third replication. Subsequent troubleshooting by the crew showed no leak, which made gas bubbles the likely cause. A software modification was uploaded overnight to increase the speed of the liquid loop pump, which is expected to minimize the potential for gas bubbles in the system. Today, Fincke will re-prime the system, TOCA will process a sample, and the CDR will do a second inspection for leaks.]*

Sandra Magnus will also be performing the visual "T+2 Day" microbial (bacterial & fungal) analysis and data recording of the MCDs (Microbial Capture Devices) with the first WPA sample (collected on 11/22).

Completion of routing & installing the PWD (Potable Water Dispenser) standoff hose will be attempted by Greg & Sandy later today, after the EVA-4, since it may involve temporary shutdown of the Lab ITCS LTL (Internal Thermal Control System/ Low Temperature Loop) which is required for Airlock (A/L) operation, to support the necessary disconnecting of its obstructing supply & return QDs (Quick Disconnects). *[The PWD Galley supply hose needs to be routed from the LAB1S7 rack location to the Aft Deck End Cone and from there to the Port Deck*

Standoff hose in the Lab1P4 Z-Panel. The two FEs have worked on removing the obstruction earlier by taking off a flange, then taped hose & flange to the front of the Z Panel on the rack until LTL shutdown allows completing the work.]

Mike Fincke, with Sandy Magnus, will perform a checkout of the new RSP (Respiratory Support Pack), inspecting it for any anomalies. Following successful checkout, the RSP #1002 will be swapped with RSP #1004 (location LAB1S4_D1).

In the FGB, FE-1 Lonchakov unstowed the KUBIK-2 thermostatic container/ incubator equipment and pre-packed it for transfer to the MPLM (Multi-Purpose Logistics Module), then handed it over to the Shuttle crew for return to Earth.

Lonchakov conducted the regular status check and data collection on the long-term BIO-5 Rasteniya-1 ("Plants-1") experiment, copying data from its built-in control computer to a PCMCIA memory card for subsequent downlink to the ground via OCA. *[Rasteniya-1 researches growth and development of plants under spaceflight conditions in the LADA-14 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). The payload hardware includes a module (MIS/ Module for the Investigation of Substrates), the MIS control unit (BU), a nitrogen purge unit (BPA) and other accessories. During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. LADA consists of a wall-mounted growth chamber that provides long-term, ready access for crewmember interaction. It provides light and root zone control but relies on the cabin environmental control systems for humidity, gas composition, and temperature control. Cabin air is pulled into the leaf chamber, flows over the plants and vents through the light bank to provide both plant gas exchange and light bank cooling.]*

In the Soyuz TMA-13/17S, docked at the FGB, Yuri ingressed the Descent Module (SA) and performed inspection & troubleshooting of the KhSA Cooler/Dryer, checking its V1 fan for unimpeded spinning.

Afterwards, the FE-1 completed the periodic (about twice a month) replenishing of the Elektron oxygen generator's water supply for electrolysis, filling the KOV EDV container with water collected in CWC (Contingency Water Container) #1076 from the Lab CCAA (Common Cabin Air Assembly) dehumidifier. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron shutdown.]*

A two-hour job for Lonchakov today will be the periodic survey/audit of available free stowage space in the FGB, DC1 Docking Compartment and SM PrK/PkhO (Service Module Transfer Tunnel/Transfer Compartment)) for cargo to be delivered

by Progress 31P on 11/30.

Later, the FE-1 has three additional tasks on his schedule:

- Routine maintenance of the SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier],*
- Daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur), and
- Periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the passageways PrK (SM Transfer Compartment)–PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1. *[This checkup is especially important when the ventilation/ circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).]*

In the Kibo JPM (Japanese Pressurized Module), FE-2 Chamitoff removed the AmiA (Antimicrobial Applicator) from the ITCS (Internal Thermal Control System), installed yesterday at the MTL (Moderate Temperature Loop) supply QD. *[AmiA was used to introduce OPA (Ortho-Phthalaldehyde), an antimicrobial agent, into the JPM coolant. The applicator had to remain in the loop for at least 6 hrs. As usual, the MELFI (Minus-Eighty Laboratory Freezer for ISS) Brayton-cycle motor had to be powered down for the AmiA removal (which temporarily interrupts water flow to the MELFI).]*

Afterwards, Gregory accessed the JPM ITCS and collected a coolant sample for analysis on the ground.

Due to the one-day slip of MPLM unberthing, the installation of the spare CPA (Controller Panel Assembly) at the Node-2 nadir CBM (Common Berthing Module) by Greg & Don Pettit, originally scheduled for today, will also be postponed one day.

Chamitoff and Magnus have more time reserved for standard joint "handover" activities, to be continued through the docked period ahead. Today's handover includes a 15-min familiarization of Sandy with the CMS (Countermeasure System) TVIS treadmill in the SM.

After setting up the G1 camcorder with its VDS MPC (Video Distribution System/

Multi-Purpose Converter) for transmitting external images, Sandy will be supporting the EFBM contingency task of EV2/Steve Bowen at about half way into the EVA-4 with the JEMRMS (JEM Robotic Manipulator System) by the usual activation/deactivation procedures in support of ground controllers at Tsukuba/Japan. *[Involved systems are RLT (RMS Laptop), CCP (Camera Control Panel), RMS JMUs (Joint Motor Units) motors powered from EXT-2, RMS Monitors 1&2, Arm Bus, MDP (Management Data Processor), etc. The MA (Main Arm) will finally be parked at its regular stow position.]*

CDR Fincke will support the EFBM activity by monitoring the external latch #1 retraction from the EFBM BCDU (Berthing Mechanism Control & Display Unit)'s LED monitor and later turning off the G1 camcorder and MPC equipment.

The ISS crew completed their physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2, FE-2-18), TVIS treadmill (FE-1), RED (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

Cargo Transfers: MPLM (Multi-Purpose Logistics Module) cargo transfers by Pettit, Boe, Chamitoff, Fincke and Piper (who is also transferring Middeck cargo and will configure MPLM racks for return cargo) are continuing at a brisk pace, remaining slightly ahead of schedule. *[As of this morning, Middeck transfers were 63% complete, MPLM 91%, overall 84%.]*

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 8:57am EST [= epoch]):
Mean altitude -- 354.2 km
Apogee height -- 358.8 km
Perigee height -- 349.6 km
Period -- 91.62 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006641
Solar Beta Angle -- 12.0 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude change in the last 24 hours – +400 m
Revolutions since FGB/Zarya launch (Nov. 98) – 57376.

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
11/26/08 -- Progress M-66/31P launch
11/28/08 -- STS-126/Endeavour/ULF-2 undocking;
11/30/08 -- STS-126/Endeavour/ULF-2 landing;
11/30/08 -- Progress M-66/31P docking – DC1 Nadir (~7:23am)
12/07/08 -- Progress M-65/30P reentry (after 3 weeks autonomous flight for geophysical experiments)
12/18/08 -- Russian EVA-21
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Endeavour/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/23/08
Date:	Sunday, November 23, 2008 1:55:25 PM
Attachments:	

ISS On-Orbit Status 11/23/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – Flight Day 10 (FD10) of STS-126/ULF-2. ISS crew work cycle today: Wake 8:55am EST; sleep 12:25am; Shuttle crew: 12:55am (both until 8:55am tomorrow). Ahead: Week 5 of Increment 18.*

Mission ULF-2's EVA-3 was completed successfully last night by Heidemarie Stefanyshyn-Piper & Steve Bowen in 6h 57min, accomplishing nearly all of its objectives and some get-aheads.
[During the spacewalk, Piper (EV1) & Bowen (EV2) –

- *Cleaned and lubricated the race ring bearing surfaces under Stbd SARJ (Solar Alpha Rotary Joint) covers 1, 2, 3, 11, 12, 13, 14, 15, 16, 19, 20, 21, and 22,*
- *Removed & replaced five SARJ TBAs (Trundle Bearing Assemblies -2, -4, -12, -1, -7).*

Additionally, as get-ahead tasks for EVA-4, the spacewalkers removed covers 17 & 18 and TBA-3.
Cleaning and lubing of the race ring bearing surfaces beneath covers 17 & 18, plus replacement of TBA-3 will be completed during tomorrow's EVA-4.
Official start time of the spacewalk was 1:01pm EST, and it ended at 7:58pm. Total EVA duration (PET = Phase Elapsed Time) was 6h 57min. It was the 117th spacewalk for ISS assembly & maintenance and the 89th from the station (65 from Quest, 24 from Pirs, plus 28 from Shuttle) totaling 551h, the third EVA for Expedition 18 and the 17th so far this year (including two Russian Orlan EVAs). It was the 5th spacewalk for Stefanyshyn-Piper (33h 42m tot.) and the second for Bowen (13h 49m tot.). After today's EVA, a total of 155 spacewalkers (119 NASA astronauts, 25 Russians, and 11 astronauts representing Japan-1, Canada-4, France-1, Germany-2 and Sweden-3) have logged 739h 22min outside the station on building, outfitting & servicing. It was the 137th spacewalk involving U.S. astronauts.]

After the spacewalkers' ingress (7:58pm EST), post-EVA activities by MS3 Piper,

MS2 Bowen, FE-2 Chamitoff, CDR Fincke & CDR Ferguson in the A/L and preparations for EVA-4 tomorrow consisted of --

- *Taking photographs of the EMU gloves for downlink and inspection,*
- *Swapping EMU/spacesuits from Kimbrough to Bowen,*
- *Recharging the EMU/spacesuits with water from PWR (Payload Water Reservoir),*
- *Reconnecting the LTAs (Lower Torso Assemblies) to the EMUs,*
- *Initiating METOX (Metal Oxide) canister regeneration for EVA-4,*
- *Capping the UIA (Umbilical Interface Assembly,*
- *Checking out the SAFER units,*
- *Initiating battery charging in the A/L BSA (Battery Stowage Assembly),*
- *Turning the DCS & D2XS cameras around, and*
- *Preparing the A/L Equipment Lock (E-LK).*

In support of EVA-4, Sandra Magnus will set up the photo/TV infrared camera for TRJJ imagery.

CDR Fincke & FE-2-18 Magnus are continuing with WRS (Water Recovery System) activation activities. *[The UPA (Urine Processor Assembly) was activated again but shut down after about 2 hrs due to low centrifuge speed, similar to yesterday's shutdown. Engineering teams met and determined that a possible cause of the low centrifuge speed is a vibration-induced resonance. The on-orbit unit is mounted on vibration isolators. In a late-added task estimated at 2 hrs, Mike & Sandy are performing an on-orbit modification today to remove the vibration isolators and hard-mount the UPA on the rack structure.]*

The WPA (Water Processor Assembly) completed its first on-orbit water processing, using about 40 lbs of waste water (mostly condensate). Magnus collected samples of this first WPA-produced water for archival storage & in-flight chemistry/ microbiology analysis with the U.S. WMK (water microbiology kit) and one sample for the newly installed TOCA (Total Organic Carbon Analyzer), then downlinked the results of the latter via USB stick and SSC (Station Support Computer). *[The first two replications of the analysis cycle were completed, but the analysis terminated during the third replication. The problem could have been caused by too much gas being pushed through the system which created bubbles. There is also a chance that an internal water leak is responsible. Another software update may be required.]*

FE-1 Lonchakov conducted his first session with the Russian biomedical MBI-15 "Pilot-M"/NEURO signal response experiment after setting up the workplace and equipment. Afterwards, the Pilot-M & Neurolab-2000M gear was disassembled and stowed away. *[MBI-15 requires a table, ankle restraint system, eyeball electrodes for an EOG (electrooculogram), and two hand controllers (RUO & RUD)*

for testing piloting skill in "flying" simulations on a laptop (RSK1) under stopwatch control, as well as for studying special features of the psychophysiologic response of cosmonauts to the effects of stress factors in flight.]

FE-2 Chamitoff set up the payload equipment for his fourth session with the 3D-Space (Mental Representation of Spatial Cues During Space Flight) experiment and then performed the protocol, with all three exercises (distance, illusion, handwriting). After all data were stored on PCMCIA memory card, the ESA multipurpose laptop was shut down and the hardware disconnected & stowed away. *[3D-SPACE, a collaboration of ESA and the French space agency CNES (Centre National de la Recherche Scientifique), is designed to identify accurate visual perception & localization of objects in the space environment as prerequisites for spatial orientation & reliable performance of motor tasks in microgravity. Humans have mental representations of their surroundings based on sensory information & experience. It is hypothesized that depth & distance perception of objects could be altered in space due to the absence of gravitational reference and ambiguous perspective cues. 3D-SPACE investigates (a) depth perception & the role of perspective cues using geometric illusions, (b) distance perception using both standard psychophysics tests & natural three-dimensional scenes presented on a virtual reality head-mounted display, and (c) the effects of cognitive vs. perceptual-motor changes using handwriting & drawing tests.]*

In the COL (Columbus Orbital Laboratory), Gregory installed the ITCS (Internal Thermal Control System) Sampling Adapter to retrieve a sample of its coolant for return to the ground in the Shuttle middeck.

Later today, the FE-2 will hook the AmiA (Antimicrobial Applicator) into the Kibo JPM (Japanese Pressurized Module)'s ITCS, connecting it to the MTL supply QD. *[AmiA introduces OPA (Ortho-Phthalaldehyde), an antimicrobial agent, into the JPM TCS coolant. The applicator must remain installed in the loop for at least 6 hrs.]*

Yesterday's routing & installing of the PWD (Potable Water Dispenser) standoff hose by Greg & Sandy was not completed due other hoses obstructing the space required. *[The hose is routed from the LAB1S7 rack location to the Aft Deck End Cone and from there to the Port Deck Standoff. The two FEs removed the obstruction by taking off a flange, then taped hose & flange to the front of the Z Panel on the rack. Specialists will determine the future plan. Temporary shutdown of the LTL (Low Temperature Loop) may help to get the hose installed.]*

Sandra Magnus took the periodic O-OHA (on-orbit hearing assessment) test, a 30-min. NASA environmental health systems examination to assess the efficacy of acoustic countermeasures, using a special MEC (Medical Equipment Computer)

laptop application. It was Sandy's first O-OHA test. *[The O-OHA audiography test involves minimum audibility measurements for each ear over a wide range of frequencies (0.25-10 kHz) and sound pressure levels, with the crewmembers using individual-specific Prophonics earphones, new Bose ANC headsets (delivered on 30P) and the SLM (sound level meter). To conduct the testing, the experimenter is supported by special EarQ software on the MEC, featuring an up/down-arrow-operated slider for each test frequency that the crewmember moves to the lowest sound pressure level at which the tone can still be heard. The baseline test is required not later than about Flight Day 14 for each new Expedition and is then generally performed once per month. Note: There have been temporary hearing deficits documented on some U.S. and Russian crewmembers, all of which recovered to pre-mission levels.]*

FE-2-18 Magnus performed outfitting in the Node -2 by installing a guide ring on the EVA side of the nadir hatch.

In response to a JAXA request, Magnus will also make a second attempt at retracting the structural latch (#1) of the EFBM (Exposed Facility Berthing Mechanism) by activating the BCDU (Berthing Mechanism Control & Display Unit) in the JPM. *[During yesterday's checkout of the Kibo EFBM by Mike & Sandy structural latch #1 failed to retract. The retraction was added as a 20-min contingency task to EVA-4.]*

Preparatory to today's scheduled waste water dump from the Shuttle, FE-2-18 Magnus verified closure of the protective window shutters in the Kibo JPM (Japanese Pressurized Module). Later today, CDR Ferguson will maneuver the ISS/ Shuttle stack into the proper attitude at ~5:46pm EST, and at ~5:46pm the venting (in retrograde direction) will commence, lasting about 50 min. –XVV attitude (Shuttle bottom facing opposite to flight direction for TPS protection) will then be restored with Shuttle thrusters (ORB mode) at ~7:00pm and taken over by CMG Momentum Management. *[This will be the last waste water dump for this mission, even if it is extended by a day.]*

FE-1 Lonchakov performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM (Service Module), including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

SOZh checkups by Yuri today also include the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem, gathering

weekly data on total operating time & “On” durations for reporting to TsUP-Moscow.

Lonchakov is to conduct the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the passageways PrK (SM Transfer Compartment)–PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1. *[This checkup is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).]*

The FE-1 will also shoot situational awareness video of ventilation air ducts in the SM, DC1 Docking Compartment and Soyuz spacecraft, followed by downlinking the footage to TsUP-Moscow.

The ISS crew completed their physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2, FE-2-18), TVIS treadmill (CDR, FE-1), RED (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1). It was the second exercise session for Sandy Magnus, now to become a daily protocol for her.

At ~5:05pm EST, the combined crew is scheduled for three PAO TV downlinks with ABC News (Gina Sunseri), CBS News (Bill Harwood, Peter King) and NBC News (Lester Holt).

At ~8:50pm, the ten crewmembers are scheduled for an in-depth one-hour review of procedures for tomorrow’s 6:30h EVA-4 spacewalk, with egress tomorrow afternoon at ~1:45pm EST.

Bowen (EV2) and Kimbrough (EV3) will begin their “campout” in the “Quest” Airlock (A/L) tonight at ~11:20pm with hatch closure and depressurization of the CL (Crewlock) from 14.7 to 10.2 psi, followed by mask prebreathe until ~12:25m. Sleep time for the ISS crew begins at 12:25am, for the Shuttle crew half an hour later.

EVA-4 Look-ahead: Following the usual hygiene break/with mask prebreathe for Bowen & Kimbrough at ~9:30am-10:40am tomorrow morning after spending the night on 10.2 psi, the A/L hatch will be closed again for EVA preps in 10.2 psi, followed by EMU purge and prebreathe in the EMUs. Afterwards, with CL depressurization and EV1/EV2 egress, EVA-4 nominally begins at ~1:45pm EST. Objectives of the spacewalk are –

- *Remove & later re-install P3 MLI (Multi-Layer Insulation) covers 11, 10, 7, 6, 14, 15,*
- *Clean & lubricate under Stbd SARJ (Solar Alpha Rotary Joint) covers 17/18,*

- *Install TBA-3, re-install covers,*
- *Lubricate Port SARJ,*
- *Install ETVCG camera,*
- *Perform contingency EFBM structural latch #1 retract, and*
- *GPS antenna.*

Possible get-aheads: S1 Radiator, P1 Radiator.

The NOAX (Non-Oxide Adhesive Experimental) caulk applicator from the Shuttle, using Braycote-601 lubricant for the trundle bearings, will be left in the A/L for use during EVA-4 if needed. It will not be modified to reduce Braycote flow from its nozzle

KURS-P Repair Update: After the K2-VKA-01 container of the KURS-P automated rendezvous radar system was installed and connected yesterday in the SM by FE-1 Lonchakov, it was successfully tested by TsUP-Moscow and is running with no issues. *[The passive KURS-P is required for the Progress 31P docking next week (11/30) at the DC1 nadir port, with KURS backup provided by the manual TORU system.]*

Cargo Transfers: MPLM (Multi-Purpose Logistics Module) cargo transfers by Pettit, Boe, Piper, Chamitoff, Magnus and Fincke are continuing at a brisk pace, remaining slightly ahead of schedule. *[As of this morning, Middeck transfers were 56% complete, MPLM 84%, overall 76%.]*

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 11:55am EST [= epoch]):
Mean altitude -- 353.8 km
Apogee height -- 358.3 km
Perigee height -- 349.3 km
Period -- 91.62 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006641
Solar Beta Angle -- 15.8 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours – 0 m
Revolutions since FGB/Zarya launch (Nov. 98) – 57363.

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

11/26/08 -- Progress M-66/31P launch
11/27/08 -- STS-126/Endeavour/ULF-2 undocking; 10:40am – *Under Review*
11/29/08 -- STS-126/Endeavour/ULF-2 landing; ~2:10pm – *Under Review*
11/30/08 -- Progress M-66/31P docking – DC1 Nadir (~7:23am)
12/07/08 -- Progress M-65/30P reentry (after 3 weeks autonomous flight for geophysical experiments)
12/18/08 -- Russian EVA-21
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Endeavour/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/22/08
Date:	Saturday, November 22, 2008 3:38:23 PM
Attachments:	

ISS On-Orbit Status 11/22/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – Flight Day 9 (FD9) of STS-126/ULF-2. ISS crew work cycle today: Wake 8:55am EST; sleep 12:25am (11/23); Shuttle crew: 12:55am (both until 8:55am tomorrow).*

Mission ULF-2's EVA-3 is underway, having begun at 1:01pm EST (44 min ahead of schedule). EVA-3 is being performed by Heidemarie Stefanyshyn-Piper (EV1) & Steve Bowen (EV2). *[EV1 & EV2 began their "campout" (nachalo desaturatsiy = desaturation start) last night at ~11:20pm in the U.S. Airlock (A/L) with hatch closure and depressurization of the CL (Crewlock) from 14.7 to 10.2 psi, followed by mask prebreathe at ~11:20pm-12:25am. This morning, following the usual hygiene break/ with mask prebreathe for the two spacewalkers at ~9:30am-10:40am after spending the night on 10.2 psi, the A/L hatch was closed again for EVA preps in 10.2 psi, followed by EMU (Extravehicular Mobility Unit) purge and prebreathe in the EMUs, assisted by CDR Ferguson. Afterwards, with CL depressurization and EV1/EV2 egress, EVA-3 began at 1:01pm, with MS4 Kimbrough providing IVA (Intravehicular Activity) assist.]*

EVA-3 is expected to last about 7h (i.e., until ~8:01pm). Spacewalk objectives at the Stbd SARJ (Solar Alpha Rotary Joint) are –
For EV1/Piper:

- Clean & lube under covers 15 & 16; install TBA (Trundle Bearing Assembly)-1 plus covers 15 & 16;
- Remove, clean & lube under covers 13, 14, 11, 12, 17, 18; remove, clean & lube under TBAs-1, -7, -12, -3;
- Install TBAs-1, -7, -12, -3; install covers 13, 14, 11, 12, 17, 18.

For EV2/Bowen:

- Remove, clean & lube under covers 21, 22, 1(do not R&R TBA-6);
- Remove, clean & lube under covers 2, 3, 19, 20; remove, clean & lube under TBA-7,-4;
- Clean TBA-4 DLA (Drive Lock Assembly);

- Install TBAs-7,-4; install covers 2, 3, 19, 20 (do not R&R TBA-5).

A NOAX (Non-Oxide Adhesive Experimental) caulk applicator from the Shuttle, using Braycote-601 lubricant for the trundle bearings, was approved for use on EVA-3 & EVA-4. *[For EVA-3, it was left in the A/L for use if needed. For EVA-4, it will be modified to reduce Braycote flow from its nozzle.]*

After the spacewalkers' return on board tonight, post-EVA activities by MS3 Stefanyshyn-Piper, MS2 Bowen, FE-2 Chamitoff & CDR Ferguson in the A/L will consist of --

- Recharging the EMU/spacesuits with water from PWR (Payload Water Reservoir),
- Reconnecting the LTAs (Lower Torso Assemblies) to the EMUs
- Initiating METOX (Metal Oxide) canister regeneration,
- Capping the UIA (Umbilical Interface Assembly,
- Initiating battery charging in the A/L BSA (Battery Stowage Assembly),
- Taking photographs of the EMU gloves for downlink and inspection.

Before breakfast, FE-2-18 Sandra Magnus completed her first session with the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function), collecting a wet saliva sample. *[IMMUNE protocol requires the collection to occur first thing post-sleep, before eating, drinking and brushing teeth, and all samples are stored at ambient temperature. Along with NUTRITION (Nutritional Status Assessment), INTEGRATED IMMUNE samples & analyzes participant's blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected at intervals during the collection day using a specialized book that contains filter paper. The liquid saliva collections require that the crewmember soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations.]*

After having successfully deinstalled the K2-VKA-01 container of the KURS-P automated rendezvous radar system in the FGB, FE-1 Lonchakov is currently mounting and connecting the FGB box in the SM (Service Module) in place of its failed counterpart which he has also removed since yesterday. A functions test by TsUP-Moscow over RGS (Russian Groundsite) is scheduled for later today. *[The passive KURS-P is required for the Progress 31P docking next week (11/30) at the DC1 nadir port, with KURS backup provided by the manual TORU system.]*

Subsequent to the KURS installation and test, Lonchakov has three additional tasks

on his schedule:

- Routine maintenance of the SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier],*
- Daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur), and
- Periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the passageways PrK (SM Transfer Compartment)–PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1. *[This checkup is especially important when the ventilation/ circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).]*

During the planned reactivation of the Elektron oxygen generator machine at 32 amps by the ground later today (~4:16pm), Lonchakov will monitor the external temperature of its secondary purification unit (BD) for the first 10 minutes of operations to ensure that there was no overheating. *[The gas analyzer used on the Elektron during nominal operations for detecting hydrogen (H_2) in the O_2 line (which could cause overheating) is not included in the control algorithm until 10 minutes after Elektron startup.]*

As has become standard operating procedure after deactivation/reactivation of VD-SU monitoring mode, as required for the Elektron power-down/-up, Yuri will also perform a quick function verification of the SUBA Ethernet connection between the OpsLAN (Operations Local Area Network) and the BRI Smart Switch Router in the SM.

CDR Fincke & FE-2-18 Magnus are continuing with WRS (Water Recovery System) activation activities. *[The UPA (Urine Processor Assembly) shut down last night after processing pretreated urine for about 2 hrs, probably due to mechanical interference in the DA (Distillation Assembly) centrifuge (one of three). The centrifuge was restarted in maintenance mode and performed nominally. UPA will be restarted today. Meanwhile, the WPA (Water Processing Assembly) continues to collect condensate water and is ready to begin processing when the quantity of distillate collected reaches the minimum amount required to begin.]*

Afterwards, Magnus will collect samples of the first WPA-produced water for archival storage and in-flight chemistry/microbiology analysis. Using MCDs (microbial capture devices) from the U.S. WMK (water microbiology kit) for treatment/processing (after no more than 6 hours of the collection), Sandy will then process the samples in the MWAK (microbial water analysis kit) for inflight coliform bacteria (Escherichia coli) detection.

Chamitoff & Magnus have 2:50h set aside for performing Part 1 of installing the PWD (Potable Water Dispenser) hose, today routing the jumper behind several Lab racks which will have to be rotated away from the wall after disengaging their UAMs (Upper Attach Mechanisms).

Other tasks by the FE-2-18 in support of getting the new Regen-ECLSS (Environment Control & Life Support System) on line on today's schedule include –

- Completing installation of the Galley (ER6/EXPRESS Rack 6) in the Lab by mating umbilicals and setting up its ELC (ER Laptop Computer for later activation by the ground (POIC/Payload Integration & Operation Center),
- Processing samples from the successfully installed TOCA for activation & checkout, and
- Performing leak checks on the WRS-1 & WRS-2 racks.

Gregory & Sandra have another ~4 hrs blocked out for standard joint "handover" activities, to be continued through the docked period ahead.

Mike Fincke is scheduled to feed the butterflies in the CGBA-5/CSI-3 (Commercial Generic Bioprocessing Apparatus/CGBA Science Insert 3) by powering down and decabling the payload, accessing its interior and exposing new food to the larvae in the Butterfly Habitat, then closing up, recabling and reactivating the payload. *[The two world-famous spiders meanwhile have torn down their initially confused three-dimensional webs and have produced traditional symmetrical ones, amazing fascinated watchers and puzzling experts with this surprisingly quick adaptation to zero-G. See more below under Science Update.]*

The ISS crew completed their physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2-18), TVIS treadmill (CDR, FE-1, FE-2), RED (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1). It was the second exercise session for Sandy Magnus, now to become a daily protocol for her.

Cargo Transfers: MPLM (Multi-Purpose Logistics Module) cargo transfers by Pettit, Ferguson, Boe, Kimbrough and Fincke are continuing at a brisk pace, remaining slightly ahead of schedule. *[As of this morning, Middeck transfers were 39% complete, MPLM 77%, overall 67%.]*

EFBM Contingency Task: During yesterday's checkout of the Kibo EFBM (External Facility Berthing Mechanism) by Fincke & Magnus, one of the structural latches (SL#1) failed to retract. The IMMT (ISS Mission Management Team) today approved a JAXA request to add a 20-min contingency task to EVA-4 to retract the latch manually.

Shuttle/ISS Reboost: The planned reboost by the Orbiter was performed successfully yesterday at 12:10pm, raising the stack's mean altitude by 2.2 km.

Weekly Science Update *(Expedition Eighteen -- Week 4)*

3-D SPACE: Planned.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Complete.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3/4 (Binary Colloidal Alloy Test 3/4): No news.

BIO-4: Complete.

CARDIOCOG-2: Complete.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): In progress. For the next CCISS session, Mike will be using a newly refurbished unit that will arrive on ULF-2.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-3/CGBA-5 (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus 5): "Mike and Sandy – thank you for the superb job of installing the spiders and larvae in their new environment and for the beautiful HD video of CSI-03 installation. Teachers, students, and all of the CGBA team are enjoying it. The two spiders are cohabitating somewhat peacefully so far and we have witnessed some web-building and tearing down of web, but no direct observation of eating. However, we have observed that the output part of the nutrition cycle is working for at least one of the spiders so there must be ingestion going on at some point. Both have been seen drinking from the water source in the cubbies. The butterfly larvae continue to eat voraciously. We can see only five out of six at any one time, but

they tend to crawl everywhere, including inside the food chambers, so it may be that we are looking at a different 'five' in each image. Even the fruit flies have supplied some entertainment with their adaptations to micro-g. Students have begun to access the webpage where images are being posted for comparison to the habitats they have in their classrooms. We've heard from many teachers about the excitement and enthusiasm these experiments have generated already."

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): On 11/5, EuTEF was finally permanently re-activated, after the PLEGPAY memory erase activity. The MIL-BUS error has occurred 3 times this week. Each time the power feeder#1 is cycled and the instruments are brought back on. There was also a problem on 11/19 with a DMS error at COL-CC which prevented commanding that day.-_DEBIE-2: 24-hrs science script ran, started on 11/17 and 11/18, and 11/20. DEBIE-2 is running this week to record any debris impact that may take place in conjunction with the SARJ clean-up activities;-_DOSTEL: On-going science acquisition;- EuTEMP: Currently inactive as planned;-_EVC: Started picture taking on 11/20;- EXPOSE: On-going science acquisition;-_FIPEX: Next script will run after the EVAs are completed;- MEDET: On-going science acquisition; PLEGPAY: Inactive, "Experiment 1" memory has been erased on 10/30. Plasma generation capability has been disabled;- TRIBOLAB: Anomaly with TRIBOLAB Ball Bearing experiment motor, currently being analyzed;

FSL (Fluid Science Laboratory): FSL is nominal.

GEOFLOW: MMA measurements were performed during the docking of ULF2 on 11/17 and successfully downlinked. It is planned to resume the GEOFLOW science runs after 30P undocking, ULF-2 mission and 31P docking.

HDTV System Test DL (JAXA): Complete.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long

Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: Underway for Sandra Magnus.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): In progress.

Marangoni Experiment for ISS in JAXA FPEF (Fluid Physics Experiment Facility): In progress.

Micro-G Clay (JAXA EPO): Complete.

MISSE (Materials ISS Experiment): Ongoing.

Moon Photography from ISS (JAXA EPO): Complete.

MOP (Motion Perception in Zero-G): Three ULF-2 astronauts are participating in this experiment (daily questionnaires)

MSG-SAME (Microgravity Science Glovebox): Complete.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MUSCLE-G (LBP/Low Back Pain): Six ULF2 astronauts are participating in this experiment (daily questionnaires)

NOA-1/-2 (Nitric Oxide Analyzer, ESA): Complete.

NUTRITION w/REPOSITORY: “Greg, thanks for the great work in completing all Nutr/Rep inflight sessions. Your participation is greatly appreciated! All samples will be returning with you, allowing the PI to begin analysis soon after return. Mike, Thanks for the great job completing your FD30 session. Crew notes were very helpful.”

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PCRF (Protein Crystallization Research Facility) Reconfiguration (JAXA): Complete.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): The 25 new Fluid Modules are now on-orbit with STS-126. They are a new-and-improved design that should be easier to deploy and close than the ones Greg Chamitoff used, and researchers are looking forward to performing a new series of experiments with Mike Fincke.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): "Greg, your only remaining sleep activity will be doffing and stowing the Actiwatch on the Shuttle with the Shuttle crew prior to landing. Mike, thanks for completing the download and initialization activity. Your remaining activities include monthly downloads, 3 weeks of sleep logging and then stowing the Actiwatch. Any additional Sleep logging is above and beyond and greatly appreciated by the PI."

SOLAR (Solar Monitoring Observatory): SOLAR (USOS) – The Sun visibility window is planned to start on 11/21. Some anomalies are currently being worked for SOLACES and SOVIM instruments. A software patch was successfully uploaded on 11/20 and SOLAR is now running version 4.7 and is in pointing mode;- SOVIM: No science acquisition, non-nominal mode: instrument power consumption was much lower than expected in nominal mode. Trouble-shooting activities were performed on 11/11 and these were not successful. Ground teams are analyzing the data, before next attempts are planned. - SOLSPEC: –Waiting for Sun observation window;- SOLACES: Waiting for Sun observation window.

SOLO (Sodium Loading in Microgravity): Complete.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): Reserve.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): Complete.

CEO (Crew Earth Observations): "There won't be any CEO inputs until 12/1. We stand down from CEO ops and assist with shuttle imagery tasks during shuttle missions."

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

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Six-person crew on ISS

07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
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12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From: vonPuttkamer, Jesco H. (HQ-CJ000)

To: Von Puttkamer, Jesco H. (HQ-CE010);

CC:

Subject: ISS On-Orbit Status 11/21/08

Date: Friday, November 21, 2008 3:46:34 PM

Attachments:

ISS On-Orbit Status 11/21/08

All ISS systems continue to function nominally, except those noted previously or below. *Flight Day 8 (FD8) of STS-126/ULF-2. ISS crew work cycle today: Wake 8:55am EST; sleep 12:25am; Shuttle crew: 12:55am (both until 8:55am tomorrow).*

Mission ULF-2's EVA-2 was completed successfully last night by Heidemarie Stefanyshyn-Piper & Shane Kimbrough in 6h 45min, accomplishing all its objectives, with two minor deviations.
[During the spacewalk, Piper (EV1) & Kimbrough (EV3) –

- *Relocated two CETA (Crew Equipment Translation Aid) Carts [moved both carts from Stbd side of MT (Mobile Transporter) to Port side with SSRMS support, required prior to S6 installation on Flight 15A],*
- *Lubricated the SSRMS LEE A (Latching End Effector A) snares [to prepare for grappling the Japanese HTV (H-II Transfer Vehicle) in Fall 2009],*
- *Cleaned Stbd SARJ (Solar Alpha Rotary Joint) Race Ring [the cleaning included successful testing of a procedure involving wet scraping with grease from a wet wipe instead of the straight nozzle grease gun],*
- *Removed/replaced TBAs (Trundle Bearing Assemblies) [during install of TBA-11 (#1001) a bolt was inadvertently over-torqued and a TBA insert yielded; TBA-11 was removed, to be returned to Earth for rework and another ("dirty") TBA was installed in its place, possibly to be replaced with a pristine one as a get-ahead). TBA covers 15 & 16 were tied down as planned. Over EVA-1 and EVA-2 a total of five TBAs have been removed and replaced (6, 8, 9, 10, & 11). TBA-2 was removed and left off.]*

Official start time of the spacewalk was 12:58pm EST, and it ended at 7:43pm, terminated somewhat earlier than planned due to increased CO_2 level in Shane Kimbrough's EMU (~3.2%) which also lost radio comm during return to the Airlock (A/L). Total EVA duration (PET = Phase Elapsed Time) was 6h 45min. It was the 116th spacewalk for ISS assembly & maintenance and the 88th from the station (64 from Quest, 24 from Pirs, plus 28 from Shuttle) totaling 544h 03min, the second

EVA for Expedition 18 and the 16th so far this year (including two Russian Orlan EVAs). It was the 4th spacewalk for Stefanyshyn-Piper (26h 45m tot.) and the first for Kimbrough (6h 45m). After today's EVA, a total of 153 spacewalkers (117 NASA astronauts, 25 Russians, and 11 astronauts representing Japan-1, Canada-4, France-1, Germany-2 and Sweden-3) have logged 732h 25min outside the station on building, outfitting & servicing. It was the 136th spacewalk involving U.S. astronauts.]

After the spacewalkers' ingress (7:43pm EST), post-EVA activities by MS3 Piper, MS4 Kimbrough, FE-2 Chamitoff, CDR Fincke & CDR Ferguson in the A/L and preparations for EVA-3 tomorrow consisted of --

- *Taking photographs of the EMU gloves for downlink and inspection,*
- *Recharging the EMU/spacesuits with water from PWR (Payload Water Reservoir),*
- *Reconnecting the LTAs (Lower Torso Assemblies) to the EMUs*
- *Initiating METOX (Metal Oxide) canister regeneration for EVA-3,*
- *Capping the UIA (Umbilical Interface Assembly,*
- *Initiating battery charging in the A/L BSA (Battery Stowage Assembly), and*
- *Turning the DCS & D2XS cameras around.*

For FE-1 Lonchakov, besides a high-priority IFM (Inflight Maintenance) task to repair the SM (Service Module) KURS-P (see item below), a second critical activity today are preparations for terminating and disassembling the extensive MATRYOSHKA-R (RBO-3-2) radiation suite in the SM for return to Earth.

FE-2-18 Sandra Magnus completed the temporary installation of the TOCA (Total Organic Carbon Analyzer) in the US Lab, on the frontside of the OGS (Oxygen Generator System) Rack, pos. P1, with CDR Fincke assisted in some procedural steps where torquing of N_2 & H_2O hose fittings was required. *[The ~40-min job involved the installation of the nitrogen & water hoses, priming of the TOCA buffer container, closeout activities after MCC-Houston completed a ground-performed N_2 leak check, and checksum (baseline) analyzer sample processing for a calibration check.]*

Mike Fincke continued the preparation of the WRS UPA (Water Recovery System/ Urine Pretreat Assembly), filling the WSTA (Water Storage Tank Assembly) with pretreated urine from EDV-U container but did not complete the planned processing when the UPA closed down after two hours. *[As troubleshooting is underway, the first sample of processed drinking water is currently expected tomorrow. UPA also triggered a "hazardous failure" yesterday due to an easily remedied stuck check*

valve and later restarted nominally.]

Afterwards, the CDR collected ITCS (Internal Thermal Control System) fluid samples in the Node-2, one from the MTL (Moderate Temperature Loop), a second one from the LTL (Low TL) sample ports after flushing the sampling gear, for return to Earth.

In the Kibo JPM (Japanese Pressurized Module), Magnus supported the checkout of the EFBM (Exposed Facility Berthing Mechanism) by Fincke with the JEMRMS (Robotic Manipulator System). *[Sandy performed final activation of the RMS, with RLT (RMS Laptop), CCP (Camera Control Panel), RMS Monitors, reset JEU (Joint Expedited Undocking) Resolver, MDP (Management Data Processor) mode changed to MA (Main Arm) BRAKE, and Zero position reset for the PTU MA EE (Pan & Tilt Unit) of the MA EE End Effector).]*

Fincke meanwhile set up the G1 video camcorder with MPC (Multipurpose Converter) and powered up the Scopemeter & Current Probe for conducting the EFBM checkout. Afterwards, Magnus prepared the JEMRMS for deactivation by ground commanding, while Mike turned off the G1 camcorder and MPC. *[The checkout involved taking readings of input current to the BEP (Berthing Mechanism Electronics Package) to determine if the current limiter for the EFBM structural latches is within the expected tolerance band. Still waveforms of the readings were documented with the G1 camcorder and DCS-760 camera for downlink.]*

A sample transfer from the newly arrived GLACIER to MELFI (Minus Eighty degree Laboratory Freezer for ISS) scheduled for today was inadvertently executed yesterday in conjunction with the timelined procedures review. Effects on JAXA payloads inside MELFI at that time are being assessed, as is the continued proper functioning of GLACIER doors. *[GLACIER (General Laboratory Active Cryogenic ISS Experiment Refrigerator) units are ultra-cold freezers that will store samples as low as -185 degrees C. The GLACIER provides a double middeck locker-sized ER (EXPRESS Rack)-compatible freezer/refrigerator for a variety of experiments that require temperatures ranging from +4 degC (39 degF) to -185 degC (-301 degF). GLACIER is part of the Cold Stowage Fleet of hardware which includes the MELFI and the MERLIN (Microgravity Experiment Research Locker/Incubator).]*

Later today, CDR Fincke is scheduled to do an inspection of the Ku-band power supplies in the Lab (#1005, #1006) that are connected to the two V10 RWS (Robotic Workstation) A31p laptops, checking on cleanliness of their four intake vents and two exhaust fan vents.

Sandy filled out the regular FFQ (Food Frequency Questionnaire), her first, on the

MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

Chamitoff and Magnus will have another 90 min set aside for standard joint "handover" activities, to be continued through the docked period ahead. The handover includes a 15-min familiarization of Sandy with the CMS (Countermeasure System)/Physical Exercise equipment, today focusing on the RED (Resistive Exercise Device) in Node-1, deferred from yesterday.

The ISS crew completed their physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2-18, FE-2), TVIS treadmill (CDR, FE-1), RED (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1). It was the first exercise session for Sandy Magnus, now to become a daily protocol for her.

At ~3:05pm EST, both crews supported the traditional 40-min. news conference conducted with U.S. media at NASA centers from the Node-2 Harmony Module. *[Media clients taped the event for use within their respective media outlets.]*

Afterwards, at ~3:45pm, the ISS and Shuttle crew assembled in the SM for posing for the standard joint crew photograph.

At ~8:50pm, the ten crewmembers are scheduled for an in-depth one-hour review of procedures for tomorrow's 7-hr EVA-3 spacewalk, with egress tomorrow afternoon at ~1:45pm EST.

Stefanyshyn-Piper (EV1) and Bowen (EV2) will begin their "campout" in the "Quest" Airlock (A/L) tonight at ~11:20pm with hatch closure and depressurization of the CL (Crewlock) from 14.7 to 10.2 psi, followed by mask prebreathe until ~12:25m. Sleep time for the ISS crew begins at 12:25am, for the Shuttle crew half an hour later.

EVA-3 Look-ahead: Following the usual hygiene break/with mask prebreathe for Bowen & Piper at ~9:30am-10:40am tomorrow morning after spending the night on 10.2 psi, the A/L hatch will be closed again for EVA preps in 10.2 psi, followed by EMU purge and prebreathe in the EMUs. Afterwards, with CL depressurization and

EV1/EV2 egress, EVA-3 nominally begins at ~1:45pm EST. Objectives of the spacewalk are continued SARJ (Solar Alpha Rotary Joint) cleaning/scraping and TBA replacements. A NOAX (Non-Oxide Adhesive Experimental) caulk applicator will be requested from the Shuttle Program, using Braycote-601 lubricant for the trundle bearings to make up for the two lost grease guns and to "buy back" some EVA time.

Cargo Transfers: MPLM (Multi-Purpose Logistics Module) cargo transfers by Pettit, Bowen, Ferguson, Boe, Magnus, Kimbrough and Fincke are continuing at a brisk pace, remaining well ahead of schedule. *[As of this morning, Middeck transfers were 33% complete, MPLM 49%, overall 45%.]*

SM KURS-P Failure Update: Activities by FE-1 Lonchakov in the RS (Russian Segment) have been modified in real time due to Moscow's decision to do a major IFM on the failed KURS-P set #1 in the SM in preparation for the Progress 31P linkup to the DC1 Docking Compartment on 11/30 (~7:23am EST). *[Results of two tests of the system on 11/19 & yesterday failed, with the transmitter of the system (essentially a passive radio/radar repeater/beacon) being suspected as cause. SM KURS set #2 is performing nominally. In an IFM lasting an estimated 10-11 hrs, Yuri Lonchakov is working today and tomorrow to replace the failed block with an identical KURS system from the FGB. RSC Energia hopes to perform a KURS test at ~3-4 pm tomorrow afternoon of Yuri can complete the R&R task by then.]*

Shuttle/ISS Reboost: For the reboost by the Orbiter at 12:10pm, the FE-2-18 verified closure of the protective science window shutters in the Kibo JPM. A delta-V of 3 fps was selected after extensive considerations of predicted debris conjunction events. Post-reboost trajectory predictions show a close approach of Cosmos 2421 Object 32846 of ~1.2 km on Saturday (11/27) at 4:16pm EST.

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 10:47am EST [= epoch]):
Mean altitude -- 351.7 km
Apogee height -- 354.7 km
Perigee height -- 349.7 km
Period -- 91.57 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0004523
Solar Beta Angle -- 22.6 deg (magnitude decreasing)

Orbits per 24-hr. day -- 15.72
Mean altitude gain in the last 24 hours -- 4 m (EVA-2)
Revolutions since FGB/Zarya launch (Nov. 98) – 57330.

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
11/26/08 -- Progress M-66/31P launch
11/27/08 -- STS-126/Endeavour/ULF-2 undocking; 10:40am – *Under Review*
11/29/08 -- STS-126/Endeavour/ULF-2 landing; ~2:10pm – *Under Review*
11/30/08 -- Progress M-66/31P docking – DC1 Nadir (~7:23am)
12/07/08 -- Progress M-65/30P reentry (after 3 weeks autonomous flight for geophysical experiments)
12/18/08 -- Russian EVA-21
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Endeavour/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/20/08
Date:	Thursday, November 20, 2008 3:19:34 PM
Attachments:	

ISS On-Orbit Status 11/20/08

All ISS systems continue to function nominally, except those noted previously or below. *Flight Day 7 (FD7) of STS-126/ULF-2. ISS crew work cycle today: Wake 8:55am EST; sleep 12:25am; Shuttle crew: 12:55am (both until 8:55am tomorrow).*

10 Years since FGB Launch! Happy 10th Anniversary, ISS!

Mission ULF-2's EVA-2 is underway, having begun at 12:58pm EST (47 min ahead of schedule). It is performed by Heidemarie Stefanyshyn-Piper (EV1) & Shane Kimbrough (EV3). EV1 & EV3 began their "campout" (*nachalo desaturatsiy* = desaturation start) last night at ~11:20pm in the U.S. Airlock (A/L) with hatch closure and depressurization of the CL (Crewlock) from 14.7 to 10.2 psi, followed by mask prebreathe at ~11:20pm-12:25am. This morning, following the usual hygiene break/with mask prebreathe for the two spacewalkers at ~9:30am-10:40am after spending the night on 10.2 psi, the A/L hatch was closed again for EVA preps in 10.2 psi, followed by EMU (Extravehicular Mobility Unit) purge and prebreathe in the EMUs, assisted by CDR Ferguson. Afterwards, with CL depressurization and EV1/EV3 egress, EVA-1 began at 12:58pm.
[For the Campout, METOX (Metal Oxide) canisters were installed in the A/L for CO_2 control. EVA-2 is expected to last about 6h 30m, i.e., until ~7:28pm, supported by the SSRMS (Space Station Remote Maneuvering System), operated by FE-2-18 Magnus & MS1 Pettit.

EVA-2 objectives (with nominal start times) are:

- *CETA (Crew Equipment Translation Aid) Carts Relocation -- ~(1:28pm) [move both carts from Stbd side of MT (Mobile Transporter) to Port side with SSRMS support, required prior to S6 installation on Flight 15A],*
- *Lubricating the SSRMS LEE (Latching End Effector) A Snares – (~3:18pm) [in preparation for grappling the Japanese HTV (H-II Transfer Vehicle)],*
- *Stbd SARJ (Solar Alpha Rotary Joint) Cleaning & TBA (Trundle Bearing Assembly) R&R -- ~(3:18pm) [re-install TBA-11 and Remove/Replace TBAs-*

8,- 9 & -12, plus possible get-aheads],

- *Clean up – (~7:03pm), and*
- *EVA-2 Ingress – (~7:28pm).]*

After the spacewalkers' return on board tonight, post-EVA activities by MS3 Stefanyshyn-Piper, MS4 Kimbrough, FE-2 Chamitoff & CDR Ferguson in the A/L will consist of --

- Recharging the EMU/spacesuits with water from PWR (Payload Water Reservoir),
- Reconnecting the LTAs (Lower Torso Assemblies) to the EMUs
- Initiating METOX (Metal Oxide) canister regeneration,
- Capping the UIA (Umbilical Interface Assembly,
- Initiating battery charging in the A/L BSA (Battery Stowage Assembly),
- Taking photographs of the EMU gloves for downlink and inspection.

Before breakfast, FE-2-18 Sandra Magnus performed her first session with the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function), collecting one wet saliva sample. *[IMMUNE protocol requires the collection to occur first thing post-sleep, before eating, drinking and brushing teeth, and all samples are stored at ambient temperature. Along with NUTRITION (Nutritional Status Assessment), INTEGRATED IMMUNE samples & analyzes participant's blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected at intervals during the collection day using a specialized book that contains filter paper. The liquid saliva collections require that the crewmember soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations.]*

FE-1 Lonchakov conducted the periodic/long-term inspection of the SM RO (Service Module Working Compartment)'s pressure hull and ring, looking for any moisture, deposits, mold, corrosion and pitting behind panels 130, 134, 135, 138, 139 and also underneath the TVIS treadmill (where deposit was discovered earlier) and the cold plates (where SNT and STR lines are installed). Last time done: 8/14. *[The inspection of the hull surface, which is coated with a primer and dark-green enamel, is done using cleaning napkins to wipe the area in question if required and reporting results to the ground. The hull inspection looks for changed color and cavities; if cavities are found, they are to be measured for depth (with chewing gum) after cleaning. Digital photographs of the shell before and after the removal of deposits were to be made for documentation.]*

For tomorrow's planned checkout of the Japanese EFBM (Exposed Facility Berthing Mechanism) in front of the Kibo JPM (Japanese Pressurized Module), FE-2-18 Magnus prepared the Scopemeter and the Current Probe instruments and checked out their operation, including the data record function of the Scopemeter. CDR Fincke meanwhile connected and attached the BCDU (Berthing Mechanism Control & Display Unit) in the JPM.

Afterwards, Sandy Magnus began with the installation of the TOCA (Total Organic Carbon Analyzer) in the US Lab, on the frontside of the OGS (Oxygen Generation System) Rack (pos. P1), tackling the first of three parts. *[The 90-min Part 1 involves the installation of TOCA ORUs (Orbital Replacement Units), with steps such as removing TCO front cover and spare media kit, then installing a USB Drive, a waste water bag, a buffer container, gas liquid separator, EDV mount assembly & seat track brackets, TOCA mounting fixtures and a grounding strap. Part 2 will require two crewmembers for ~15 min, followed by Part 3, by one crewmember, for 15 min.]*

As part of the upcoming WRS (Water Recovery System) activation during the ULF-2 docked period, Mike Fincke, with Sandy Magnus & Greg Chamitoff, prepared for UPA (Urine Pretreat Assembly) initiation by opening the manual valve of the RFTA (Recycle Filter Tank Assembly), then filled the newly installed RFTA and WSTA (Water Storage Tank Assembly) with EDV-pretreated urine and started the processing activity. *[Approximately two EDV-U containers are required to fill an empty RFTA.]*

The FE-1 will complete the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the passageways PrK (SM Transfer Compartment)–PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1. *[This checkup is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).]*

Yuri is also to take the periodic readings with the Russian AOK GANK-4M Real-Time Harmful Contaminant Gas Analyzer system and calibrated the unit.

Gregory will be conducting another one of the periodic offloadings of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (#1054) with the collected water slated for processing. Samples are not required.

Continuing the extended leak checking of the spare BZh Liquid Unit (#056) for the Elektron O_2 generator, Lonchakov charged the unit once again with pressurized N_2

from the BPA Nitrogen Purge Unit (#23) to 1 atm (1 kg/cm^2). The last test pressurization to monitor for leakage was on 10/19. *[Objective of the checkout of the BZh, which has been in stowage for almost 2 years, was to check for leakage and good water passage through the feed line inside of the BZh (from ZL1 connector to the buffer tank) and to check the response of the Electronics Unit's micro switches (signaling "Buffer Tank is Empty" & "Buffer Tank is Full". During Elektron operation, the inert gas locked up in the BZh has the purpose to prevent dangerous O_2/H_2 mixing. A leaking BZh cannot be used.]*

MPLM (Multi-Purpose Logistics Module) cargo transfers by Pettit, Bowen, Ferguson, Boe, Magnus and Fincke are continuing at a brisk pace, remaining well ahead of schedule. *[As of this morning, Middeck transfers were 33% complete, MPLM 39%, overall 37%. All MPLM racks have been transferred already. Today's transfers included RFTA components, TOCA ORUs, RAMs (Radiation Area Monitors), GPS antennas & electrical connectors, plus various items brought back to "Leonardo" for return to Earth.]*

After yesterday's maintenance and data retrieval activities on the MATRYOSHKA-R (RBO-3-2) radiation instrumentation in the SM (panel 326), Lonchakov today will turn off the AST Spectrometer.

Afterwards, Yuri is to perform the periodic (monthly) functional closure test of the Vozdukh CO_2 (carbon dioxide) removal system's spare emergency vacuum valves (AVK), in the spare parts kit. *[The AVKs are crucial because they close the Vozdukh's vacuum access lines in the event of a malfunction in the regular vacuum valves (BVK) or a depressurization in the Vozdukh valve panel (BOA). Access to vacuum is required to vent CO_2 during the regeneration of the absorbent cartridges (PP).]*

The FE-1 is also scheduled to collect another set of KAV condensate water samples from a CWC (Contingency Water Container) with US condensate from the Lab CCAA (Common Cabin Air Assembly), after having pumped it over to the usual EDV container, filling two empty drink bags for return on the Shuttle.

For added crew safety during activation of the Regen-ECLLS racks, Mike Fincke is to deploy "ECLSS Keepout Zone Cue Cards". *[In the Lab, one Regen Keepout Zone Cue Card each will be placed at location LAB1P1 (for OGS), LAB1D4 (for WRS-1) and LAB1P4 (for WRS-2).]*

Gregory Chamitoff, looking forward to his return on Endeavour on 11/29 (or 11/30), and Sandy Magnus, who has replaced him ISS FE-2, had another period set aside for standard joint "handover" activities, to be continued through the docked period

ahead. The handover again included a 15-min familiarization of Sandy with the CMS (Countermeasure System)/Physical Exercise equipment, today focusing on the RED (Resistive Exercise Device) in Node-1, as well as a review of sample transfer procedures from the newly arrived GLACIER to MELFI (Minus Eighty degree Laboratory Freezer for ISS). *[GLACIER (General Laboratory Active Cryogenic ISS Experiment Refrigerator) units are ultra-cold freezers that will store samples as low as -185 degrees C. The GLACIER provides a double middeck locker-sized ER (EXPRESS Rack)-compatible freezer/refrigerator for a variety of experiments that require temperatures ranging from +4 degC (39 degF) to -185 degC (-301 degF). GLACIER is part of the Cold Stowage Fleet of hardware which includes the MELFI and the MERLIN (Microgravity Experiment Research Locker/ Incubator).]*

In the SM, Lonchakov will conduct the routine maintenance of the SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Yuri is also timelined for the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Sandy Magnus spent some time on the MEC (Medical Equipment Computer), formatting and initializing her personal PCMCIA memory card for the TVIS treadmill.

The ISS crew completed their physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS (FE-1, FE-2), RED (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

At ~10:26am, Lonchakov supported a Russian PAO TV downlink with two a messages of greetings & congratulations: (1) to Academician Boris Yevgenevich Paton on his 90th birthday *(“…We know you as a person who applied enormous engineering talent in practical cosmonautics. Developed by you were welding in space and other technologies, as well as different large-scale structures that have been tested and used on Salyut and Mir orbital stations…”)*, and (2) to the Russian Federation of Cosmonautics for its 30th Anniversary, with its President, Veteran-Cosmonaut Vladimir Vasilievich Kovalyenok *(“…Founded in 1978, Russia’s Federation of Cosmonautics traveled a road of glory and became the largest Russian public space-oriented organization, combining 310 regional and local*

space rocket industry organizations of Russia with approximately 300,000 Federation members working under its umbrella…").

DC1 KURS Failure: Yesterday, Set 1 of the KURS automated rendezvous & docking system of the DC1 Docking Compartment failed in a test and is unavailable for the Progress 31P docking on 11/30 at the DC1 nadir port. RSC-Energia is working a Go Forward plan to use the FGB KURS unit instead.

WRM Update: An updated WRM (Water Recovery Management) "cue card" was uplinked yesterday for the crew's reference, updated with the latest water audit. *[The new card (18-0006E) lists 23 CWCs (~722.5 L total) for the four types of water identified on board: technical water (135.2 L, for Elektron electrolysis), potable water (537.4 L, incl. 174.6 L currently off-limit because of* Wautersia *bacteria), condensate water (10.7 L), waste/EMU dump and other (39.2 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

ISS Reboost: A reboost of the ISS by the Shuttle is planned for tomorrow (FD8), at ~12:10pm, with parameters to be determined pending an update on the same-day conjunction (see next item).

Conjunction: The conjunction with the Cosmos satellite, Object 2421, is still being tracked for tomorrow.

STS-126 Mission Highlights:

- Generic face-to-face handover time between Chamitoff & Magnus will be ~12 hrs max; Gregory will remain on the ISS until the day before undocking and will be scheduled as an ISS crewmember.
- Endeavour is being powered by the SSPTS (Station-Shuttle Power Transfer System) from post-docking to just before undocking. During the mated mission when ISS solar arrays are feathered for attitude maneuvers and EVA operations, SSPTS may be powered off to maintain station power margin.
- 30 hrs are required for transfer ops to/from the Shuttle middeck and 105 hours for MPLM. With all the timelined activities and rack transfers scheduled, ULF2 will be a highly choreographed transfer mission. The Shuttle crew has been thoroughly trained on the details of the choreography. In addition, each day a transfer message will be uplinked, listing specific items that need to be transferred that day due to operations requiring the items.

No CEO photo targets uplinked for today.

CEO photography can be studied at this “Gateway” website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 7:49am EST [= epoch]):
Mean altitude -- 351.7 km
Apogee height -- 354.3 km
Perigee height -- 349.1 km
Period -- 91.57 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0003904
Solar Beta Angle -- 25.5 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude gain in the last 24 hours -- 333 m (Shuttle mnvr, EVA-1)
Revolutions since FGB/Zarya launch (Nov. 98) – 57313.

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
11/26/08 -- Progress M-66/31P launch (nom.)
11/27/08 -- STS-126/Endeavour/ULF-2 undocking; 10:40am – *Under Review*
11/29/08 -- STS-126/Endeavour/ULF-2 landing; ~2:10pm – *Under Review*
11/30/08 -- Progress M-66/31P docking (nom.) – DC1 Nadir
12/07/08 -- Progress M-65/30P reentry (after 3 weeks autonomous flight for geophysical experiments)
12/18/08 -- Russian EVA-21
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Endeavour/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)

05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/19/08
Date:	Wednesday, November 19, 2008 4:00:29 PM
Attachments:	

ISS On-Orbit Status 11/19/08

All ISS systems continue to function nominally, except those noted previously or below. *Flight Day 6 (FD6) of STS-126/ULF-2. ISS crew work cycle today: Wake 8:55am EST; sleep 12:25am (until 8:55am tomorrow morning, i.e. steady for now).*
Tomorrow: 10th Year Anniversary of ISS!

Mission ULF-2's EVA-1 was completed last night successfully by Heidemarie Stefanyshyn-Piper & Stephen Bowen in 6h 52min, accomplishing all its objectives plus one get-ahead. *[During the spacewalk, Piper (EV1) & Bowen (EV2) –*

- *Transferred the empty NTA (Nitrogen Tank Assembly) from ESP-3 (External Stowage Platform 3) to Shuttle PLB (Payload Bay) & installed it under the LMC (Lightweight MPESS Carrier),*
- *Transferred the FHRC (Flex Hose Rotary Coupler) from PLB/LMC & installed it on ESP-3 as a prepositioned spare (remaining on ESP-3 until needed),*
- *Removed five covers of the Japanese EFBM (Exposed Facility Berthing Mechanism) for EFBM checkout on FD8,*
- *Removed Stbd SARJ (Solar Alpha Rotary Joint) TBAs (Trundle Bearing Assemblies) #10 & #6 and replaced them with new TBAs,*
- *Removed & brought inside TBA #11, and*
- *Performed partial cleaning and lubrication of the Stbd SARJ Race Ring (the remaining clean & lube tasks for the Stbd SARJ are planned for EVA-2 and EVA-3.*

In addition, the spacewalkers completed the following EVA get-ahead tasks:

- *Removing the SARJ Launch Restraint 4A,*
- *Closing of the Node-2 Zenith CBM (Common Berthing Mechanism) hatch cover, and*
- *Retrieving a large trash bag from Port Tool Box*.

Official start time of the spacewalk was 1:09pm EST, and it ended at 8:01pm. Total EVA duration (PET = Phase Elapsed Time) was 6h 52min. It was the 115th spacewalk for ISS assembly & maintenance and the 87th from the station (63 from Quest, 24 from Pirs, plus 28 from Shuttle) totaling 537h 18min, the first EVA for

Expedition 18 and the 15th so far this year (including two Russian Orlan EVAs). After today's EVA, a total of 151 spacewalkers (115 NASA astronauts, 25 Russians, and 11 astronauts representing Japan-1, Canada-4, France-1, Germany-2 and Sweden-3) have logged a total of 725h 40min outside the station on building, outfitting & servicing. It was the 135th spacewalk involving U.S. astronauts.]

After the spacewalkers' return on board (8:01pm EST), post-EVA activities by MS3 Stefanyshyn-Piper, MS2 Bowen, FE-2 Chamitoff, CDR Fincke & CDR Ferguson in the A/L and preparations for EVA-2 tomorrow consisted of --

- Taking photographs of the EMU gloves for downlink and inspection,
- Transferring the SAFER (Simplified Aid for EVA Rescue) units for subsequent checkout and swapout with a second set,
- Recharging the EMU/spacesuits with water from PWR (Payload Water Reservoir),
- Reconnecting the LTAs (Lower Torso Assemblies) to the EMUs
- Initiating METOX (Metal Oxide) canister regeneration,
- Capping the UIA (Umbilical Interface Assembly,
- Initiating battery charging in the A/L BSA (Battery Stowage Assembly),
- Turning the DCS & D2XS cameras around, and
- Returning the VCA1 (Video Camera Assembly 1) with its drag-thru cable from Node-2 back to the COL (Columbus Orbital Laboratory) for re-installation at its regular endcone/aft side location.

During the EVA, an untethered 30-lbs Crewlock Bag was inadvertently released from a larger ORU (Orbit Replaceable Unit) bag and floated away as the crew was cleaning up grease from a leaking lubrication gun. The lost bag contains two SARJ lubrication guns, a scraper, a scraper debris container, a large trash bag, six wipes, wireties and several tethers. The two spacewalkers shared the other set of SARJ cleaning/lubrication equipment for the remainder of the EVA. Teams are currently assessing any potential impacts to the next EVAs due to loss of the tools. *[Sufficient tools/spares are believed to be available to complete EVAs -2, -3, and -4. EVA-2 can be done with the current tool complement and will include a test to see whether the wet wipes can be used for the initial lube application. The possible use of the Shuttle NOAX (non-oxide adhesive experimental) caulk gun, intended for TPS repair, instead of the lost grease gun is being assessed, including the risk of not having the NOAX caulk gun available for an emergency and whether the caulk gun could be cleaned on orbit. Port SARJ cleaning will be reprioritized ahead of Stbd SARJ cleaning, but there will be no change to the EVA plans unless it is determined that there is insufficient grease to complete them.]*

Preparatory to today's scheduled waste water dump from the Shuttle, FE-2-18 Magnus verified closure of the protective window shutters in the Kibo JPM (Japanese Pressurized Module). Later today, CDR Ferguson will maneuver the ISS/

Shuttle stack into the proper attitude at ~5:06pm EST, and at ~5:30pm the venting (in retrograde direction) will commence, lasting about 50 min. –XVV attitude (Shuttle bottom facing opposite to flight direction for TPS protection) will then be restored with Shuttle thrusters (ORB mode) at ~7:42pm and taken over by CMG Momentum Management. *[The kick-back effect of the water dump will impact the parameters to be chosen for the ISS reboost, scheduled for FD8 (11/21).]*

Fincke, Pettit, Chamitoff & Magnus transferred the last three racks from the MPLM (Multi-Purpose Logistics Module) as well as the three ORUs required for the subsequent WRS (Water Recovery System) configuration activities. As of this morning, Middeck transfers are 30% complete, MPLM transfers 23% and overall 24%. 105 transfer hours remain in the timeline. *[With yesterday's successful transfers of five racks, i.e., WRS-1, WRS-2, ER6 (Express Rack 6/Galley), the CIR (Combustion Rack) and the WHC (Waste & Hygiene Compartment/Toilet), MPLM transfers remain ahead of timeline. This allowed accelerating the installation of the Port & Stbd Crew Quarters in the Lab to today as well as hooking up jumpers, configuring the WRS by Mod Kit-3 installations, including the RHS (Reactor Health Sensor) and CR (Catalytic Reactor) ORUs, and transferring one RSR (Resupply Stowage Rack) from the Node-2 to "Leonardo" for return to Earth.]*

FE-1 Lonchakov will work on the RS (Russian Segment) radiation payload suite "Matryoshka-R" (RBO-3-3)/SDTO (Station Development Test Objective) 50448, downloading data and removing dosimeters for return on the Shuttle. *[Yuri will be conducting the periodic time synchronization between the RSS1 laptop and BSPN payload server, after testing functionality by checking data comm between the two computers and synching RSS1 to station time with the RSC-E PingMaster application and ShellForKE payload file transfer program. Data will then be downloaded to RSS1 on a PCMCIA flash card. The FE-1 will remove 32 LULIN-5 dosimeters from the PHANTOM (leaving three in place) and prepack them with 16 containers in the PHANTOM kit for return to Earth on the Shuttle. Matryoshka's AST Spectrometer will be deactivated tomorrow.]*

Sandy Magnus has about one hour to herself for general orientation (station familiarization & acclimatization) as is customary for fresh crewmembers for the first two weeks after starting station residence, if she/he chooses to take it.

Continuing the current round of monthly preventive maintenance of RS ventilation systems, Yuri Lonchakov cleaned the four "Group B" fan screens (VT1, VTK1, VV1RO & VV2RO) in the SM (Service Module).

Yuri will also retrieve a kit with return pouches for the long-term BIO-5 RASTENIYA-1 ("Plants-1") micro-gravity plant growth payload from the Soyuz spacecraft and pack previous used KM LADA Greenhouse Root Modules for return on the Shuttle.

[RASTENIYA-1 researches growth and development of plants under spaceflight conditions in the LADA-14 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). The payload hardware includes a module (MIS/Module for the Investigation of Substrates), the MIS control unit (BU), a nitrogen purge unit (BPA) and other accessories. During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. LADA consists of a wall-mounted growth chamber that provides long-term, ready access for crewmember interaction. It provides light and root zone control but relies on the cabin environmental control systems for humidity, gas composition, and temperature control. Cabin air is pulled into the leaf chamber, flows over the plants and vents through the light bank to provide both plant gas exchange and light bank cooling.]

For FE-2-18 Magnus' upcoming first session with the biomed experiment "Integrated Immune", later today she will break out and set up the equipment needed to support saliva collection. *[Along with NUTRITION (Nutritional Status Assessment), Integrated Immune (Validating Procedures for Monitoring Crew member Immune Function) samples & analyzes participant's blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected at intervals during the collection day using a specialized book that contains filter paper. The liquid saliva collections require that the crewmember soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations. The on-orbit blood samples are collected right before undocking and returned on the Shuttle so that analysis can occur with 48 hours of the sampling. This allows assays that quantify the function of different types of white blood cells and other active components of the immune system. Samples are secured in the MELFI (Minus-Eighty Laboratory Freezer for ISS). Also included are entries in a fluid/medications intact log, and a stress-test questionnaire to be filled out by the subject at begin and end. Urine is collected during a 24-hour period, conventionally divided into two twelve-hour phases: morning-evening and evening-morning.]*

In the SM, Lonchakov will conduct the routine maintenance of the SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Yuri is also timelined for the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

In addition, the FE-1 will complete the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the passageways PrK (SM Transfer Compartment)–PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1. *[This checkup is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).]*

At ~1:10pm EST, Yuri supported two Russian PAO TV downlinks, one a message of congratulations for the 70th Anniversary of the Special Machine Building School at N.E. Bauman Moscow State Technical University (MGTU) in Moscow, the other an interview with Mixim Kiselev, host of the Otrazheniye (Reflection) Show on TV which, on 11/22, will dedicate an episode to the development of world cosmonautics.

At ~3:51pm, yesterday’s spacewalkers, Steve & Heide, will share three live PAO TV interviews, one with Associated Press (Marcia Dunn), the second with KMSP-TV, Minneapolis (Jeff Passolt) the third with WCVB-TV, Boston (Ed Harding).

The ISS crew completed their physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

At ~8:51pm, the joint crew will conduct an in-depth one-hour review of procedures for tomorrow’s EVA-2 spacewalk, with egress scheduled to start tomorrow afternoon at ~1:55pm EST.

Heidemarie Stefanyshyn-Piper (EV1) and Shane Kimbrough (EV3) will begin their “campout” in the “Quest” Airlock (A/L) with hatch closure and depressurization of the CL (Crewlock) from 14.7 to 10.2 psi tonight at ~11:20pm, followed by mask prebreathe until ~12:25m. Sleep time for the ISS crew begins at 12:25am, for the Shuttle crew half an hour later.

Following the usual hygiene break/with mask prebreathe for Kimbrough & Piper at ~9:30am-10:40am tomorrow morning after spending the night on 10.2 psi, the A/L hatch will be closed again for EVA preps in 10.2 psi, followed by EMU purge and prebreathe in the EMUs. Afterwards, with CL depressurization and EV1/EV3

egress, EVA-2 nominally begins at ~1:45pm EST.

ISS Reboost: A reboost of the ISS is planned for FD8 (11/21) at 12:10pm, with an estimated delta-V of 0.91 m/s (3 fps).

Conjunctions: Two TCAs (Times of Closest Approach) are currently being assessed for another conjunction with the Cosmos satellite, Object 2421, both on the same day as the reboost (which will be re-assessed accordingly). As of now, however, the conjunctions are outside the maneuver box, and no action appears necessary.

STS-126 Mission Highlights:

- Focused Orbiter inspection today was not required. The Shuttle TPS (Thermal Protection System)/heatshield has been completely cleared for deorbit and entry.
- Generic face-to-face handover time between Chamitoff & Magnus will be ~12 hrs max; Gregory will remain on the ISS until the day before undocking and will be scheduled as an ISS crewmember.
- Endeavour is being powered by the SSPTS (Station-Shuttle Power Transfer System) from post-docking to just before undocking. During the mated mission when ISS solar arrays are feathered for attitude maneuvers and EVA operations, SSPTS may be powered off to maintain station power margin.
- 30 hrs are required for transfer ops to/from the Shuttle middeck and 105 hours for MPLM. With all the timelined activities and rack transfers scheduled, ULF2 will be a highly choreographed transfer mission. The Shuttle crew has been thoroughly trained on the details of the choreography. In addition, each day a transfer message will be uplinked, listing specific items that need to be transferred that day due to operations requiring the items.

No CEO photo targets uplinked for today.

CEO photography can be studied at this “Gateway” website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 7:23am EST [= epoch]):
Mean altitude -- 351.4 km
Apogee height -- 354.1 km
Perigee height -- 348.6 km
Period -- 91.57 min.
Inclination (to Equator) -- 51.64 deg

Eccentricity -- 0.0004128
Solar Beta Angle -- 28.0 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.73
Mean altitude loss in the last 24 hours -- 56 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57297

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch (nom.)
11/27/08 -- STS-126/Endeavour/ULF-2 undocking; 10:40am – *Under Review*
11/29/08 -- STS-126/Endeavour/ULF-2 landing; ~2:10pm – *Under Review*
11/30/08 -- Progress M-66/31P docking (nom.) – DC1 Nadir
12/07/08 -- Progress M-65/30P reentry (after 3 weeks autonomous flight for geophysical experiments)
12/18/08 -- Russian EVA-21
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Endeavour/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/18/08
Date:	Tuesday, November 18, 2008 2:36:28 PM
Attachments:	

ISS On-Orbit Status 11/18/08

All ISS systems continue to function nominally, except those noted previously or below. *Flight Day 5 (FD5) of STS-126/ULF-2. ISS crew work/sleep cycle today: Wake 8:56am EST; sleep 12:26am tomorrow morning (until 8:56am, i.e. steadying out for now).*

Mission ULF-2's EVA-1 began at 1:09pm EST (41 min ahead of schedule), performed by Heidemarie Stefanyshyn-Piper (EV1) & Stephen Bowen (EV2). EV1 & EV2 began their "campout" (*nachalo desaturatsiy* = desaturation start) last night at ~11:20pm in the U.S. Airlock (A/L) with hatch closure and depressurization of the CL (Crewlock) from 14.7 to 10.2 psi, followed by mask prebreathe at ~11:20pm-12:25am. This morning, following the usual hygiene break/with mask prebreathe for the two spacewalkers at ~9:30am-10:40am after spending the night on 10.2 psi, the A/L hatch was closed again for EVA preps in 10.2 psi, followed by EMU purge and prebreathe in the EMUs, assisted by Chamitoff & Ferguson. Afterwards, with CL depressurization and EV1/EV2 egress, EVA-1 began at 1:09pm.
[For the Campout, METOX (Metal Oxide) canisters were installed in the A/L for CO_2 control. EVA-1 is expected to last about 6h 30m, i.e., until ~7:40pm, supported by the SSRMS (Space Station Remote Maneuvering System), operated by FE-2-18 Magnus & MS1 Pettit.
EVA-1 objectives (with nominal times) are:

- *Transfer NTA (Nitrogen Tank Assembly) from ESP-3 (External Stowage Platform 3) to Shuttle PLB (Payload Bay) & install under LMC (Lightweight MPESS Carrier) -- ~2:15 pm*
- *Transfer FHRC (Flex Hose Rotary Coupler) from PLB/LMC & install on ESP-3 -- ~4:00 pm (FHRC is a prepositioned spare remaining on ESP-3 until needed)*
- *Remove 5 covers of Japanese EFBM (Exposed Facility Berthing Mechanism) for EFBM checkout on FD8 -- ~4:26pm)*
- *Clean up starboard SARJ (Solar Alpha Rotary Joint) for subsequent repair activities -- ~4:40 pm*
- *EVA #1 Ingress -- ~7:35pm).]*

After the spacewalkers' return on board, post-EVA activities by MS3 Stefanyshyn-Piper, MS2 Bowen, FE-2 Chamitoff & CDR Ferguson in the A/L will consist of --

- Recharging the EMU/spacesuits with water from PWR (Payload Water Reservoir),
- Reconnecting the LTAs (Lower Torso Assemblies) to the EMUs
- Initiating METOX (Metal Oxide) canister regeneration,
- Capping the UIA (Umbilical Interface Assembly,
- Initiating battery charging in the A/L BSA (Battery Stowage Assembly),
- Taking photographs of the EMU gloves for downlink and inspection, and
- Returning the VCA1 (Video Camera Assembly 1) with its drag-thru cable from Node-2 back to the COL (Columbus Orbital Laboratory) for re-installation at its regular endcone/aft side location.

Before morning inspection and breakfast, FE-1 Lonchakov terminated his third experiment session for the long-term Russian sleep study MBI-12/ SONOKARD, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

Later, the FE-1 completed the standard post-delivery maintenance/checkout operations on the new Russian Orlan spacesuit MK-004 (delivered on Progress 30P) begun yesterday, along with its replaceable backpack components (BRTA-2 radio telemetry unit, BK-3M oxygen (O_2) repress bottles, LP-9 LiOH cartridge, etc.). *[Activities today included tests of the Orlan-BSS interface unit telemetry, Orlan communications, Orlan biomed parameters, installation of helmet lights removal & stowage of the LP-9 LiOH cartridge, and configuring suit and BSS for stowage in the DC1 Docking Compartment.]*

Before supporting the spacewalkers for the EVA hygiene break, FE-2 Chamitoff conducted the standard test of the EVA cameras, then assisted with EVA preparations, such as EMU (Extravehicular Mobility Unit) purging.

FE-2-18 Magnus closed the protective window shutters in the Kibo JPM (Japanese Pressurized Module). Later tonight, Sandra will perform final activation of the

JEMRMS (Robotic Manipulator System) and Arm BUS Monitor in the JPM and maneuver its MA (Main Arm) to the EFBM checkout monitor position, then deactivate the BUS Arm Monitor and the RMS.

MPLM Cargo & Transfers: MPLM (Multi-Purpose Logistics Module) "Leonardo" delivered non-time-sensitive and unpowered items. Its "home improvement" cargo includes –

- Three RSRs (Resupply Stowage Racks),
- Six RSPs (Return Stowage Platforms),
- CIR (Combustion Integration Rack),
- ER6 (EXPRESS Rack 6),
- WHC (Waste & Hygiene Compartment) rack,
- CQ1 (Crew Quarters 1) rack
- CQ3 rack,
- WRS-1 (Water Recovery System 1) rack, and
- WRS-2 rack.

The two CQ racks will be transferred from the MPLM to Node-2 and the remaining racks to the U.S. Lab. One RSR will be relocated from Node-2 to "Leonardo" for return. After MPLM hatch opening and ingress last night, cargo transfers began at a brisk pace, getting ahead of timeline quickly with the transfers of the ARED (Advanced Resistive Exercise Device) and three ZSRs (Zero-G Stowage Racks) to the ISS, which were originally planned for today. The transfers and installation of the WRS1 (Water Recovery System 1), WRS2 and EXPRESS (EXpedite PRocessing of Experiments to Space Station) Rack #6 were therefore moved up to today. *[Transfers are being performed by Pettit, Ferguson, Fincke & Magnus. Special handling constraints are in force for the WRS ORUs (Orbit Replaceable Units) of the Regenerable ECLSS (Environment Control & Life Support Systems), which are being installed today in the Lab by Fincke & Pettit at locations D4 (WRS1) & P4 (WRS2). Joining the already installed OGS (Oxygen Generator System) rack, they comprise seven (the first three installed during ULF-2, the other four stowed for later):*

- *DA (Distillation Assembly),*
- *CR (Catalytic Reactor),*
- *RHS (Reactor Health Sensor),*
- *MB (Multifiltration Bed).*
- *PF (Particulate Filter),*
- *GS (Gas Separator), and*
- *OGA (Oxygen Generator Assembly) Water ORU.]*

Yuri Lonchakov had ~90 min set aside for the periodic equipment servicing in the SM (Service Module)'s ASU toilet facility, changing out replaceable parts with new components, e.g., a filter insert (F-V), the pretreat container (E-K), and the E-K's hose. All old parts were discarded as trash. *[E-K contains five liters of pre-treat*

solution, i.e., a mix of H_2SO_4 (sulfuric acid), CrO_3 (chromium oxide, for oxidation and purple color), and H_2O (water). The pre-treat liquid is mixed with water in a dispenser (DKiV) and used for toilet flushing.]

The FE-1 used CWC (Contingency Water Container) #1069 with Lab CCAA (Common Cabin Air Assembly) condensate in the RS (Russian Segment) for the periodic (about twice a month) replenishing of the Elektron oxygen generator's water supply for electrolysis, filling the KOV thermal loops' EDV container. Once filled, the EDV was connected to the BPK transfer pump for processing. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron shutdown.]*

Collected condensate water from the Shuttle was transferred to the ISS by CDR Ferguson in a CWC.

Using the Velocicalc instrument, Gregory Chamitoff will be taking IMV (Intermodular Ventilation) flow measurements in the U.S. Lab at the Fwd Stbd outlet grille.

Lonchakov meanwhile conducts the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the passageways PrK (SM Transfer Compartment)–PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1. *[This checkup is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).]*

Later, Yuri will collect the periodic readings of potentially harmful atmospheric contaminants in the SM, using the CMS (Countermeasure System), a component of the SKDS GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, today using preprogrammed microchips to measure for o-Xylol (1,2-Dimethylbenzol, C_8H_{10}) and Methyl-Mercaptan (Methanethiol, CH_4S).

The FE-1 is also scheduled for another periodic 20-min. data collection and downlink on the long-term BIO-5 RASTENIYA-1 ("Plants-1") micro-gravity plant growth payload in the LADA/MIS (Module for the Investigation of Substrates) greenhouse. *[RASTENIYA-1 researches growth and development of plants under spaceflight conditions in the LADA-14 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). The payload hardware includes a module (MIS/ Module for the Investigation of Substrates), the MIS control unit (BU), a nitrogen purge unit (BPA) and other accessories. During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary,*

and photo/video recording. *LADA consists of a wall-mounted growth chamber that provides long-term, ready access for crewmember interaction. It provides light and root zone control but relies on the cabin environmental control systems for humidity, gas composition, and temperature control. Cabin air is pulled into the leaf chamber, flows over the plants and vents through the light bank to provide both plant gas exchange and light bank cooling.]*

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The ISS crew completed their physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1). *[For load reasons, no exercise is allowed during the 3-hr mounted EVA APFR (Articulated Portable Foot Restraint) ops which started at ~1:00pm.]*

The ISS crew is scheduled for their periodic PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Greg at ~2:30pm, Mike at ~3:00pm, and Yuri at ~4:05pm EST.

Sandy Magnus has ~2.5 hrs to herself for general orientation (station familiarization & acclimatization) as is customary for fresh crewmembers for the first two weeks after starting station residence, if she/he chooses to take it.

After their return aboard ISS, Bowen & Piper, plus EV3/Kimbrough (who will conduct EVA-2 with Piper) will fill out their questionnaires for the MOP (Motion Perception in Zero-G) study which tracks crewmembers' vestibular adaptation to changes in micro-G, i.e., the SAS/Space Adaptation Syndrome, used also by SFPs (Spaceflight Participants). Shuttle crewmembers Ferguson, Boe, Pettit and Kimbrough meanwhile will be logging their responses to the questions of the MUSCLE-G (LBP/Low Back Pain) experiment.

ISS Crew Sleep Shift Planning: To synchronize the ISS crew's timeline with STS-

126/ULF-2 docking and subsequent docked activities, Mike's, Yuri's and Greg's wake/sleep cycle has undergone a number of shifts which started on 11/14 and continued until yesterday. The early undock time (currently 10:40am for FD14) drives crew wakeup 2.5 hrs earlier, to 7:00am by FD14. The shift is completed by having set crew sleep 30 min earlier on FD4 and then moving it one hour earlier each day on FD12 and FD13. For the next five days, the wake/sleep shift schedule is as follows (all times EST):

FD5	Wake: 8:56am (11/18) – 12:26am (11/19) Sleep: 12:26am – 8:56am
FD6	Wake: 8:56am (11/19) –12:26am (11/20) Sleep: 12:26am – 8:56am
FD7	Wake: 8:56am –12:26am (11/21) Sleep: 12:26am – 8:56am
FD8	Wake: 8:56am –12:26am (11/22) Sleep: 12:26am – 8:56am
FD9	Wake: 8:56am –12:26am (11/23) Sleep: 12:26am – 8:56am

STS-126 Mission Highlights:

- Focused Orbiter inspection on FD6 is not required.
- Generic face-to-face handover time between Chamitoff & Magnus will be ~12 hrs max; Gregory will remain on the ISS until the day before undocking and will be scheduled as an ISS crewmember.
- Endeavour is being powered by the SSPTS (Station-Shuttle Power Transfer System) from post-docking to just before undocking. During the mated mission when ISS solar arrays are feathered for attitude maneuvers and EVA operations, SSPTS may be powered off to maintain station power margin.
- 30 hrs are required for transfer ops to/from the Shuttle middeck and 105 hours for MPLM. With all the timelined activities and rack transfers scheduled, ULF2 will be a highly choreographed transfer mission. The Shuttle crew has been thoroughly trained on the details of the choreography. In addition, each day a transfer message will be uplinked, listing specific items that need to be transferred that day due to operations requiring the items.

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 8:31am EST [= epoch]):
Mean altitude -- 351.4 km
Apogee height -- 354.3 km
Perigee height -- 348.6 km
Period -- 91.57 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0004232
Solar Beta Angle -- 30.0 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude gain in the last 24 hours -- 120 m (due to docked Shuttle)
Revolutions since FGB/Zarya launch (Nov. 98) -- 57282

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch (nom.)
11/27/08 -- STS-126/Endeavour/ULF-2 undocking; 10:40am – ***Under Review***
11/29/08 -- STS-126/Endeavour/ULF-2 landing; ~2:10pm – ***Under Review***
11/30/08 -- Progress M-66/31P docking (nom.) – DC1 Nadir
12/07/08 -- Progress M-65/30P reentry (after 3 weeks autonomous flight for geophysical experiments)
12/18/08 -- Russian EVA-21
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Endeavour/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/17/08
Date:	Monday, November 17, 2008 3:35:18 PM
Attachments:	

ISS On-Orbit Status 11/17/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 4 of Increment 18. Flight Day 4 (FD4) of STS-126/ULF-2. First full day of Sandra Magnus as new crewmember (FE-2) of Expedition 18. ISS crew work cycle today: Wake 9:26am EST; sleep 12:26am (until 8:56am tomorrow morning).*

At ~1:02pm EST (14 min. ahead of schedule), **MPLM "Leonardo" was securely linked to Node-2** after its successful transfer from the Shuttle cargo bay to the nadir berthing port.

Before the MPLM (Multi-Purpose Logistics Module) transfer, CDR Fincke and FE-2 Chamitoff prepared the nadir port vestibule in Node-2 for the berthing, powering up the CBCS (Centerline Berthing Camera System) and gathering equipment needed for the MPLM ingress activities.

FE-2-18 Sandra Magnus closed the protective window shutters in the Kibo JPM (Japanese Pressurized Module).

After the MPLM was grappled in the Endeavour cargo bay by MS1 Don Pettit & MS4 Bob Kimbrough with the SSRMS (Space Station Remote Manipulator) at ~11:30am, the following steps are being executed in the course of the day up to crew ingress late tonight (planned at ~8:30pm EST):

- Unberth MPLM in Shuttle cargo bay;
- Verify Node-2 CBM (Common Berthing Mechanism) premate status;
- MPLM transfer from Shuttle cargo bay to Node-2 nadir port (no crew exercises allowed onboard during SSRMS maneuver from pre-install until after ABOLTS Complete due to loads/dynamics flight rules);
- Node-2 nadir CBM First Stage Capture;
- Node-2 nadir port vestibule safing by CDR Fincke (disconnect jumpers);
- SSRMS switched to Limp mode;
- Node-2 nadir CBM 2nd Stage Capture & ABOLTS (Acquire Bolts) –

completed: ~1:02pm;

- SSRMS brake applied; SSRMS post-mating ungrapple;
- Node-2 to MPLM vestibule pressurization & leak check; verification of CBM bolt loading complete; ISA/VAJ (Internal Sampling Adapter/Vacuum Access Jumper) left connected for planned vestibule depress on FD12;
- MPLM vestibule configured for Ingress (including 30 min. MLI/thermal cover removal, 45 min. jumper install & 15 min. power recovery);
- Removal of CBM CPAs (Controller Panel Assemblies); activation of MPLM cabin fan & smoke detector;
- Pressure equalization & IMV airducts installation;
- Installation of ARS (Air Revitalization System) jumper & vestibule closeout; removal of hatch pip pin; opening of MPLM IMV (Intermodular Ventilation) valves, closing of PPRA's & turning on lights;
- MPLM Ingress: Relocation of PBA (Portable Breathing Apparatus) & PFE (Portable Fire Extinguisher) from JLP (Japanese Logistics Pressurized Segment) to MPLM for installation.

After MPLM berthing, CDR Fincke disassembled & removed the CBCS in Node-2, making room for subsequent cargo transfers.

FE-1 Lonchakov meanwhile unstowed a new Russian Orlan MK spacesuit (#004) along with its replaceable components (BRTA-2 radio telemetry unit, BK-3M oxygen (O_2) repress bottles, LP-9 LiOH cartridge, etc.) and conducted the first part of the standard post-delivery maintenance/checkout operations on the suit and its backpack. *[Activities today included unpacking, installation of UDSK pressure gauge on Orlan, spacesuit & backup bladder leak check, valve tests, BSS interface unit checkout, and BRTA installation & checkout. More work on MK-004 is scheduled tomorrow.]*

Later today, Yuri will also terminate the “drying out” of the SOKOL pressure suit for Sandy Magnus (which she would wear as a Soyuz passenger in a contingency return) after yesterday’s standard leak checkout.

Scheduled for ~6:15pm, CDR Fincke will have 30 min. for configuring the transfer equipment which allows the Shuttle to supply O_2 to the ISS PBAs (Portable Breathing Apparatus) in support of the subsequent pre-EVA mask prebreathe by EV1 Heide Piper & EV2 Stephen Bowen for denitrogenation. Earlier today, Mike Fincke closed the N_2 (nitrogen) feed valve, used for purging the O_2 supply line from the Shuttle.

Preparatory to tonight’s campout, Gregory Chamitoff uninstalled & removed the temporary IWIS RSU (Internal Wireless Integrated System/Remote Sensor Unit)

accelerometer from the U.S. Airlock (A/L), used last evening for taking docking disturbance data.

FE-2-18 Magnus will be getting some excellent experience with the JEMRMS (Japanese Experiment Module/Robotic Manipulator System) in the Kibo JPM when she is setting up the RMS MA (Main Arm) later today for supporting tomorrow's EVA-1.
[Working with Tsukuba/SSIPC (Space Station Integration & Promotion Center), Magnus has to –

- *Activate the RLT (RMS Laptop),*
- *Start up the JEMRMS DOUG (Dynamic Onboard Ubiquitous Graphics) application to receive & display SRMS/SSRMS/JEMRMS joint angle telemetry from a PCS (Portable Computer System) A31p laptop (if required),*
- *Activate JEMRMS and verify activation completion,*
- *Activate CCP (Camera Control Panel) and RMS Monitors,*
- *Perform Zero Position reset after resetting JEU (Joint Expedited Undocking) Resolver and changing MDP (Management Data Processor) mode to MA BRAKE,*
- *Activate JEMRMS BUS Monitor Start and start the monitor,*
- *Maneuver the external MA to A-1 support position,*
- *Stop JEMRMS BUS Monitor & Deactivate it, and*
- *Power down RMS Monitor and CCP for saving power resources.]*

Chamitoff performed the standard maintenance & checkout on the onboard CSA-CP (Compound Specific Analyzer-Combustion Products) instruments. *[Prime unit currently is CSA-CP #1057 (to be replaced); three backup units are #1060, #1053, #1055. There are now also four new CSA-CPs, delivered on STS-126, wrapped in Mylar. Today's maintenance involved checkout and battery change on one of the two sampling pumps (#1019) and on the four new units which were then to be zero-calibrated and left to the usual de-contamination/degassing of new units.]*

Lonchakov conducted the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the passageways PrK (SM Transfer Compartment)–PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1. *[This checkup is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).]*

Flight Engineer Magnus had an hour to herself for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residence, if she/he chooses to take it.

Chamitoff, slated for return on Endeavour on 11/29 (or 11/30), and Magnus, who replaced him yesterday as ISS FE-2, have ~2:00h set aside for standard joint "handover" activities, to be continued through the docked period ahead. The handover included a 15-min familiarization of Sandy with the CMS (Countermeasure System)/Physical Exercise equipment, today focused on the CEVIS (Cycle Ergometer with Vibration Isolation).

More ULF-2 cargo transfers from the Shuttle to ISS were handled by Chamitoff, Magnus and Shuttle crewmembers.

Mike Fincke accessed the CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) and installed the new CSI-03 (CGBA Science Insert #3) payload, transferred yesterday, with its two weaver spiders and (currently) 4-day old larvae in the spider habitat.

In preparation for his first run with the U. S. SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment, the CDR first downloaded SLEEP data from his Actiwatch to the HRF-1 (Human Research Facility 1) laptop for subsequent downlink and verification by the support scientist, then re-initialized his and Greg's Actiwatches for their upcoming individual sessions. *[To monitor their sleep/wake patterns and light exposure, Fincke & Chamitoff will wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout this run. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

The FE-1 is scheduled to take and download the periodic sensor readings of the Russian "Pille-MKS" (MKS = ISS) radiation dosimetry experiment which has ten sensors placed at various locations in the Russian segment (DC1, SM starboard & port cabin windows, ASU toilet facility, control panel, etc.). *[Nine of the ten dosimeters are read manually.]*

In preparation for tomorrow's EVA-1, Gregory set up the batteries of the new D2XS cameras for recharge (which takes at least three hours).

Also for the EVA, Mike meanwhile will be adding new tethers to the DCS-760 cameras (making tie wraps unnecessary) and configuring the DCS-760s, one with 28mm lens, the other with flash attachment and 35mm lens, before starting recharging their batteries.

Yuri performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U*

urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]

The FE-1 also completed the regular daily job of IMS (Inventory Management System) “delta file” updating/editing for the weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew performed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

The joint crew conducted an in-depth one-hour review of procedures for the EVA-1 spacewalk, with egress scheduled to start tomorrow afternoon at ~1:51pm EST.

Heidemarie Stefanyshyn-Piper (EV1) and Stephen Bowen (EV2) will begin their “campout” (*nachalo desaturatsiy* = desaturation start) in the A/L with hatch closure and depressurization of the CL (Crewlock) from 14.7 to 10.2 psi at ~11:21pm, followed by mask prebreathe at ~11:21-12:26am. Sleep time for the ISS crew begins at 12:26am. *[For the Campout, METOX (Metal Oxide) canisters were installed in the A/L for CO_2 control.]*

Following the usual hygiene break/with mask prebreathe for Bowen & Piper at ~9:31am-10:41am tomorrow morning after spending the night on 10.2 psi, the A/L hatch will be closed again for EVA preps in 10.2 psi, followed by EMU purge and prebreathe in the EMUs. Afterwards, with CL depressurization and EV1/EV2 egress, EVA-1 nominally begins at ~1:51pm EST.

ISS Crew Sleep Shift Planning: To synchronize the ISS crew’s timeline with STS-126/ULF-2 docking and subsequent docked activities, Mike’s, Yuri’s and Greg’s wake/sleep cycle is undergoing a number of shifts which started on 11/14. The early undock time (10:32am) drives crew wakeup 2.5 hrs earlier, to 7:00am by FD14. The shift is completed by having set crew sleep 30 min earlier on FD4 and then moving it one hour earlier each day on FD12 and FD13. For the next six days, the wake/sleep shift schedule is as follows (all times EST):

FD4	Wake: 9:26am (11/17) –12:26am (11/18) Sleep: 12:26am – 8:56am
FD5	Wake: 8:56am (11/18) – 12:26am (11/19) Sleep: 12:26am – 8:56am
FD6	Wake: 8:56am (11/19) –12:26am (11/20) Sleep: 12:26am – 8:56am

FD7	Wake: 8:56am –12:26am (11/21) Sleep: 12:26am – 8:56am
FD8	Wake: 8:56am –12:26am (11/22) Sleep: 12:26am – 8:56am
FD9	Wake: 8:56am –12:26am (11/23) Sleep: 12:26am – 8:56am

STS-126 Mission Highlights:

- Focused Orbiter inspection on FD6 will not be required.
- Generic face-to-face handover time between Chamitoff & Magnus will be ~12 hrs max; Gregory will remain on the ISS until the day before undocking and will be scheduled as an ISS crewmember.
- Endeavour is being powered by the SSPTS (Station-Shuttle Power Transfer System) from post-docking to just before undocking. During the mated mission when ISS solar arrays are feathered for attitude maneuvers and EVA operations, SSPTS may be powered off to maintain station power margin.
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Eccentricity -- 0.0003378
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Mean altitude loss in the last 48 hours -- 20 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57265

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12/18/08 -- Russian EVA-21
02/09/09 -- Progress M-66/31P undocking & deorbit
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02/12/09 -- Progress M-67/32P docking
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02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
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05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Endeavour/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/16/08
Date:	Sunday, November 16, 2008 5:08:45 PM
Attachments:	

ISS On-Orbit Status 11/16/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – docking day. Ahead: Week 4 of Increment 18. Flight Day 3 (FD3) of STS-126/ULF-2. ISS crew work cycle today: Wake 9:30am EST; sleep 12:56am (until 9:26am tomorrow morning).*

STS-126/Endeavour docked smoothly at the ISS PMA-2 (Pressurized Mating Adapter-2) port at 5:01pm EST, four minutes ahead of timeline, in darkness (orbital sunset ~4:34pm/sunrise ~5:09pm), after successfully completing the RPM (R-Bar Pitch Maneuver) in daylight at ~4:16pm and arriving at +V-Bar (straight in front of ISS) at ~4:30pm (Mike reported that he & Greg could see "no damages whatsoever" on the underbelly TPS through their telephoto lenses). The station now hosts ten occupants again as Mission ULF-2 is underway. *[The combined crew is comprised of ISS-CDR Fincke, FE-1 Lonchakov, FE-2 Chamitoff, STS-CDR Chris Ferguson, PLT Eric Boe, MS1 Donald Pettit, MS2/EV2 Steve Bowen, MS3/ EV1 Heidemarie Stefanyshyn-Piper, MS4/EV3 Shane Kimbrough, and MS5/ FE-2-18 Sandra Magnus who replaces Chamitoff as FE-2, as the latter returns on Endeavour as MS-5.]*

Hooks closure to rigidize the Shuttle/ISS linkup was at ((~5:12pm, ~7 min after dock)). After the docking, the station was reoriented as planned to minimize the risk of micrometeoroid/debris impacts upon the Shuttle (-XVV = -x-axis in velocity vector, +z-axis in local vertical). *[Earlier, at ~2:00pm, the ISS maneuvered to docking attitude after attitude control authority was handed over (~1:55pm) from USOS (US Segment) to RS MCS (Russian Segment Motion Control System).]*

After wake-up, FE-2 Chamitoff ended his FD180 (Flight Day 180) session with the NASA/JSC experiment NUTRITION w/Repository, his sixth and last, by collecting a final urine sample upon wakeup for storage in the MELFI (Minus-Eighty Laboratory Freezer for ISS). The sampling kit was then stowed away. *[The current NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes*

measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]

FE-1 Lonchakov performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. Additionally, the FE-1 today checked up on the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem, gathering weekly data on total operating time & "On" durations for reporting to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

Preparatory to the Shuttle arrival, FE-2 Chamitoff verified closure of the Lab & Kibo JPM (Japanese Pressurized Module) science window shutters as protection against thruster plumes. *[The window shutters must remain closed when Shuttle is within 3000 ft/915m of the ISS. They may be opened for no more than 15 minutes for photo documentation if the Shuttle is in Freedrift.]*

Other pre-docking preparations:

- Chamitoff hooked up the UOP DCP (Utility Outlet Panel/Display & Control Panel) power bypass cable at the CUP RWS (Cupola Robotic Work Station) to allow video coverage of the Shuttle's approach and docking with the SSRMS (Space Station Remote Manipulator System) cameras;
- Fincke & Chamitoff readied RPM (R-Bar Pitch Maneuver) photo/video equipment, including camera battery checks, for Orbiter TPS (Thermal Protection System) documentation (Gregory wielded the 400mm-lens D2X camera (replacing the earlier DCS-760), Mike the 800mm-lens D2X for documenting the tile acreage & bottom-side door seals),
- Lonchakov set up & later activated the camera timers upon Orbiter RPM initiation and handled the camcorder (the timers indicated beginning & end of the bottom-side photography window), then also
- Performed final STTS communications configuration checks for the docking (later, upon docking, Yuri switched USOS/RS comm systems to their mated-flight mode),
- Configured proper headset connection for supporting the RPM activity

(which resulted in ~300 pictures of the Orbiter bottom TPS), and

- Verified powerdown of the amateur radio equipment in the SM to prevent RF interference during the proximity & docking ops.

Shortly before the docking, the crew configured the Russian MCS for the automatic "PMA-2 Arrival" mode, an operational sequence used to monitor Orbiter arrival at the PMA-2. *[At "Capture Confirmed", ISS attitude was immediately set to Freedrift for about 22 min. to allow dampening out relative motions of ISS and Endeavour (with the ODS (Orbiter Docking System) dampers/shock absorbers), then maneuvered to "Mated TEA" (Torque Equilibrium Attitude) to account for the new overall configuration with Endeavour docked.]*

Docking took place at 5:01pm EST. After leak checks of the ODS (Orbiter Docking System) vestibule for about an hour, ISS/STS hatches will be opened (nominally) at ~6:16pm.

After hatch opening, before installation of the ventilation airduct between station and Endeavour, Yuri Lonchakov will be performing the standard collection of air samples with the Russian AK-1M sampler in the SM, FGB, Lab, and then also in the Orbiter.

After the traditional Welcome Ceremony (~6:50pm, nom.), the new arrivals are to receive the mandatory 25-min. Safety Briefing.

FE-2-18 Magnus will transfer her IELK (Individual Equipment Liner Kit) seat liner from the Shuttle to the Soyuz TMA-13/17S crew return vehicle where Yuri Lonchakov installs it for the new FE-2. Greg Chamitoff's IELK seat liner will be pulled out and temporarily stowed for return to Earth. *[A crewmember is not considered transferred until her/his IELK, AMP (ambulatory medical pack) and ALSP (advanced life support pack) drug kit are transferred. After today's reconfiguration of the FE-2 IELKs, Sandy has technically become an Expedition 18 member aboard ISS.]*

After the Safety Briefing, Fincke is scheduled to deploy and activate the SSC WRLS (Station Support Computer/ Wireless Router) laptop in Node-2 to joint the Shuttle & Station LANs (Local Area Networks) during the ULF-2 docked period.

Chamitoff relocates the COL VCA1 (Columbus Orbital Laboratory/Video Camera Assembly 1) to Node-2 to monitor transfer activities in the Node-2/MPLM (Multi-Purpose Logistics Module) area.

Greg will also exchange the video tape in the VDS VTR (Video Distribution Subsystem/Video Tape Recorder) which has documented the response of the S1

HRS (Heat Rejection Subsystem) Radiator to the docking disturbances.

First cargo transfers from the Shuttle middeck to the ISS are scheduled for Chris, Donald, Heidemarie, Steve, Sandra & Gregory to begin at ~8:30pm.

Later, Mike Fincke and Shuttle crewmembers Don, Eric & Shane will be working the Robotics arms to hand over the grappled OBSS (Orbiter Boom Sensor System) from the SSRMS (Space Station Remote Manipulator System) to the SRMS (Shuttle RMS) and then "park" the SSRMS in MPLM "Leonardo" viewing position.

Yuri and Sandy will be inspecting new SOKOL pressure suits, conducting the standard leak checks.

Before sleep time, FE-2 Chamitoff has ~45 min reserved for deploying the new Emergency Warning books & C&W (Caution & Warning) cue cards for the ULF-2 docked period in the Lab, Soyuz, SM, A/L (normally located in Node-2), Airlock, and Node-2.

At ~10:30pm, Sandra Magnus is scheduled for her first weekly PMC (Private Medical Conferences) via S- & Ku-band audio/video as ISS crewmember.

ISS Crew Sleep Shift Planning: To synchronize the ISS crew's timeline with STS-126/ULF-2 docking and subsequent docked activities, Mike's, Yuri's and Greg's wake/sleep cycle is undergoing a number of shifts which started last night (11/14). The early undock time (10:32am) drives crew wakeup 2.5 hrs earlier, to 7:00am by FD14. The shift is completed by moving crew sleep 30 min earlier on FD4 and then one hour earlier each day on FD12 and FD13. For the first seven days, the wake/ sleep shift schedule is as follows (all times EST):

FD3	Wake: 9:30am (11/16) –12:56am (11/17) Sleep: 12:56am – 9:26am (11/17)
FD4	Wake: 9:26am –12:26am (11/18) Sleep: 12:26am – 8:56am
FD5	Wake: 8:56am (11/18) – 12:26am (11/19) Sleep: 12:26am – 8:56am
FD6	Wake: 8:56am (11/19) –12:26am (11/20) Sleep: 12:26am – 8:56am
FD7	Wake: 8:56am –12:26am (11/21) Sleep: 12:26am – 8:56am
FD8	Wake: 8:56am –12:26am (11/22) Sleep: 12:26am – 8:56am

FD9	Wake: 8:56am –12:26am (11/23) Sleep: 12:26am – 8:56am

STS-126 Mission Highlights:

- MPLM "Leonardo" will be installed on Node-2 on FD4; ingress same day just before Presleep. MPLM transfers start FD5 with four racks, followed on FD6 by 8 racks, including the Galley (/ER6).
- Focused Orbiter inspection is nominally planned for FD6. However, since the installed MPLM will obstruct a small area on the lower starboard wing for Focused inspection, MPLM berthing could be delayed to FD5 if the Debris Assessment Team, in reviewing the RPM imagery on the evening of FD3, identifies an area of concern associated with the starboard wing. Late inspection will be completed in its entirety after the Shuttle undocks on FD14. Endeavour will be undocking with the OBSS (Orbiter Boom Sensor System) on the SRMS (Shuttle Remote Manipulator System) in preparation for that inspection.
- Generic face-to-face handover time between Chamitoff & Magnus will be 12 hrs max; Gregory will remain on the ISS until the day before undocking and will be scheduled as an ISS crewmember.
- Endeavour will be powered by the SSPTS (Station-Shuttle Power Transfer System) from post-docking to just before undocking. During the mated mission when ISS solar arrays are feathered for attitude maneuvers and EVA operations, SSPTS may be powered off to maintain station power margin.
- 30 hrs are required for transfer ops to/from the Shuttle middeck and 105 hours for MPLM. With all the timelined activities and rack transfers scheduled, ULF2 will be a highly choreographed transfer mission. The Shuttle crew has been thoroughly trained on the details of the choreography. In addition, each day a transfer message will be uplinked, listing specific items that need to be transferred that day due to operations requiring the items.

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 9:15am EST [= epoch]):
Mean altitude -- 351.3 km
Apogee height -- 354.1 km
Perigee height -- 348.5 km
Period -- 91.57 min.

Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0003921
Solar Beta Angle -- 32.5 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 55 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57251

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch (nom.)
11/27/08 -- STS-126/Endeavour/ULF-2 undocking; 10:40am
11/29/08 -- STS-126/Endeavour/ULF-2 landing; ~2:10pm
11/30/08 -- Progress M-66/31P docking (nom.) – DC1 Nadir
12/07/08 -- Progress M-65/30P reentry (after 3 weeks autonomous flight for geophysical experiments)
12/18/08 -- Russian EVA-21
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Endeavour/15A launch – S6 truss segment
02/14/09 -- STS-119/Endeavour/15A docking
02/24/09 -- STS-119/Endeavour/15A undocking
02/26/09 -- STS-119/Endeavour/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Endeavour/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Endeavour/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/15/08
Date:	Saturday, November 15, 2008 4:37:21 PM
Attachments:	image001.gif

ISS On-Orbit Status 11/15/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – pre-docking preparations day for CDR Fincke, FE-1 Lonchakov & FE-2 Chamitoff.*

STS-126/Endeavour (ISS ULF-2) lifted off last night right on time (7:55pm EST) with all systems performing nominally, for ISS rendezvous tomorrow, Sunday (11/16), to dock at ~5:13pm EST. At launch, the ISS was over the Pacific at 46.4 deg S Lat, 161.1 deg W Long. The Orbiter is carrying the seven-member crew of CDR Chris Ferguson, PLT Eric Boe, MS1 Donald Pettit, MS2/EV2 Steve Bowen, MS3/EV1 Heidemarie Stefanyshyn-Piper, MS4/EV3 Shane Kimbrough, and MS5/ Exp-18 FE-2 Sandra Magnus. Magnus will replace ISS Flight Engineer 2 Gregory Chamitoff who returns on 11/29 (nominal) with STS-126. *[STS-126 is the 124th space shuttle flight, the 27th flight to the station, the 22nd flight for Endeavour and the fourth flight in 2008. Endeavour carries about 32,000 pounds of cargo, including supplies and "home improvement" equipment necessary to double the crew size from three to six members in Spring 2009. The new station cargo includes additional sleeping quarters, a second toilet and a resistance exercise device. The shuttle also will deliver a new crew member (Magnus) and bring back another (Chamitoff) after more than five months aboard the station (**see night-launch picture, below**).]*

Wake-up time for the ISS crew today was slipped by 3:30h, from 1:00am to 4:30am EST. Sleeptime tonight will start at 10:30pm, to extend to 9:30am tomorrow. See below for a partial overview of the scheduled sleep cycle shifting to bring station activities in line with Shuttle arrival and departure.

To perform a thorough cleaning of the FGB (Functional Cargo Block), FE-1 Lonchakov removed the Russian POTOK-150MK (150 micron) air filter unit of the SOGS air revitalization subsystem from its regular location in the Service Module (SM) and transferred it to the FGB, installed it temporarily on a panel on Velcro and let it run for six hours. Afterwards, Yuri replaced the POTOK pre-filter and returned the assembly to its nominal place in the SM.

FE-2 Chamitoff's first activity this morning was to start on Part 2 of his Flight Day 180 session with the NASA/JSC experiment NUTRITION w/Repository. This was an all-day session, the sixth and last for Greg, of collecting urine samples several times for 24 hrs, to

continue through first void tomorrow morning. *[The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by supercold MELFI dewars), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

CDR Fincke worked on the THC IMV (Temperature & Humidity Control/Intermodule Ventilation) Assembly in the USOS (US Segment), configuring diffusers in the Lab to optimize air mixing for CO_2 removal and installed a temporary (additional) air duct in Node-2 for increased Shuttle ventilation. *[Until the TeSS (Temporary Sleep Station) is removed, only five of the six diffusers (air intakes) are accessible in the Lab.]*

In further preparation for the ULF-2 spacewalks, Chamitoff worked in the US Airlock (A/L) –

- removing panels as a get-ahead for O_2 setup on FD3,
- installing & connecting an IWIS RSU (Internal Wireless Instrumentation System/ Remote Sensor Unit) accelerometer set for ULF-2 docking data take, running off the SSC-4 laptop, and
- powering up the A/L PCS (Portable Computer System) laptop.

Greg also booted up the Cupola A31p PCS in the Lab.

Lonchakov meanwhile prepared for tomorrow's RPM (R-bar Pitch Maneuver) at Endeavour's arrival by initiating charging for the D2X cameras to be used for the photo session by Fincke and Chamitoff. *[Batteries must be charged for at least three hours. Three batteries will be used for the camera configuration, with a fourth and fifth battery reserved as a backup. The RPM will document the bottom-side mapping of the Orbiter at the arrival of the Shuttle with digital cameras and a video camcorder. During the RPM at ~600 ft from the station, the "shooters" have only ~90 seconds for taking high-resolution digital photographs of all tile areas and door seals on Endeavour, to be downlinked for launch debris assessment. Thus, time available for the shooting will be very limited, requiring great coordination between the two headset-equipped photographers and the Shuttle pilot.]*

Also for the RPM and the subsequent docked phase, Fincke configured the camcorder and installed the BPSM (Battery Powered Speaker Microphone Unit) with its long drag-through cable.

In preparation for ULF-2, Michael Fincke supported the ground in pressurizing & leak-checking the PMA-2 (Pressurized Mating Adapter 2) for ingress, hatch opening and stowage after the Shuttle's arrival. *[PMA-2, at the ISS bow, will be the docking port for Endeavour tomorrow.]*

Gregory worked on the SSC (Station Support Computer) carrying the all-important OSTPV (Onboard Short Term Plan Viewer) to reprogram the OSTPV for showing Shuttle data such as the MET (Mission Elapsed Time) band and the timelines of the upcoming Endeavour crew.

Yuri completed the routine daily servicing of the SM's SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

At ~10:25am, the CDR powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, & power supply) and conducted, at 10:30am, a ham radio exchange with the Newcomers Club in Saitama, Iruma, Sitama, Japan. *["After the first school contact in Japan, many children wanted to get amateur licenses because they want to talk with the astronauts on ISS. In Saitama area, about 30 children got their ham radio licenses. Therefore, we organized the Newcomers Club and used the school contact, and we are already teaching the orbit of a satellite and so on." Questions to Mike were uplinked beforehand. "Is it true that you have a plan to connect the space station to the earth with the carbon nanotube?"; "How did you vote for the presidential election?"; "What do you think to become an astronaut?"; "What is inconvenient to live in zero gravity?"; "Is space food delicious?"; "When do you feel difficulty in space station?"; "Which planet would you like to visit in the future? And why?"; "How do you spend your free time? Do you play games?"; "What is your favorite Japanese word?"; "How long do you think you can live in the space station?"]*

The crew performed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

WRM Update: An updated WRM (Water Recovery Management) "cue card" was uplinked yesterday for the crew's reference, updated with Thursday's (11/13) water audit. *[The new card (18-0006D) lists 23 CWCs (~755.0 L total) for the four types of water identified on board: technical water (135.2 L, for Elektron electrolysis), potable water (573.6 L, incl. 174.6 L currently off-limit because of* Wautersia *bacteria), condensate water (7.0 L), waste/ EMU dump and other (39.2 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

ISS Crew Sleep Shift Planning: To synchronize the ISS crew's timeline with STS-126/ ULF-2 docking and subsequent docked activities, Mike's, Yuri's and Greg's wake/sleep cycle is undergoing a number of shifts which started last night (11/14). The early undock time (10:32am) drives crew wakeup 2.5 hrs earlier, to 7:00am by FD14. The shift is completed by moving crew sleep 30 min earlier on FD4 and then one hour earlier each

day on FD12 and FD13. For the first seven days, the wake/sleep shift schedule is as follows (all times EST):

FD1	Wake: 1:00 am (11/14) – 8:00pm Sleep: 8:00pm (11/14) – 4:30am (11/15)
FD2	Wake: 4:30am (11/15) – 10:30pm Sleep: 10:30pm – 9:30am (11/16)
FD3	Wake: 9:30am –12:56am (11/17) Sleep: 12:56am – 9:26am (11/17)
FD4	Wake: 9:26am –12:26am (11/18) Sleep: 12:26am – 8:56am
FD5	Wake: 8:56am (11/18) – 12:26am (11/19) Sleep: 12:26am – 8:56am
FD6	Wake: 8:56am (11/19) –12:26am (11/20) Sleep: 12:26am – 8:56am
FD7	Wake: 8:56am –12:26am (11/21) Sleep: 12:26am – 8:56am

STS-126 Mission Highlights:

- MPLM "Leonardo" will be installed on Node-2 on FD4; ingress same day just before Presleep. MPLM transfers start FD5 with four racks, followed on FD6 by 8 racks, including the Galley (/ER6).
- Focused Orbiter inspection is nominally planned for FD6. However, since the installed MPLM will obstruct a small area on the lower starboard wing for Focused inspection, MPLM berthing could be delayed to FD5 if the Debris Assessment Team, in reviewing the RPM imagery on the evening of FD3, identifies an area of concern associated with the starboard wing. Late inspection will be completed in its entirety after the Shuttle undocks on FD14. Endeavour will be undocking with the OBSS (Orbiter Boom Sensor System) on the SRMS (Shuttle Remote Manipulator System) in preparation for that inspection.
- Generic face-to-face handover time between Chamitoff & Magnus will be 12 hrs max; Gregory will remain on the ISS until the day before undocking and will be scheduled as an ISS crewmember.
- Endeavour will be powered by the SSPTS (Station-Shuttle Power Transfer System) from post-docking to just before undocking. During the mated mission when ISS solar arrays are feathered for attitude maneuvers and EVA operations, SSPTS may be powered off to maintain station power margin.
- 30 hrs are required for transfer ops to/from the Shuttle middeck and 105 hours for MPLM. With all the timelined activities and rack transfers scheduled, ULF2 will be a highly choreographed transfer mission. The Shuttle crew has been thoroughly trained on the details of the choreography. In addition, each day a transfer message will be uplinked, listing specific items that need to be transferred that day due to operations requiring the items.

CEO photo targets uplinked for today were **Heard Island, Australia** *(Heard Island is a*

bleak, uninhabited, and mountainous island located in the Southern Ocean about two-thirds of the way from Madagascar to Antarctica. Its mountains are covered in glaciers and dominated by Mawson Peak, a 9,006 ft high complex volcano which forms part of the Big Ben massif. A long thin spit named "Elephant Spit" extends from the east of the island. ISS pass was in the light of midday with weather satellite imagery trends suggesting improving visibility. Shooting well right of track and trying for detailed oblique views of this challenging target), **Kerguelen Archipelago** *(partial clearing, early afternoon, nadir, this glaciated and volcanic archipelago is located in the far South Indian Ocean nearly 2,000 miles southeast of the island of Madagascar. Of primary interest is photography for monitoring of the rarely photographed ice field and glaciers located on the western end of the main island. ISS approach was from the west in early-afternoon illumination with at least partial clearing expected. Trying for a near-nadir mapping pass with the long lens),* **Patagonian Glaciers** *(ISS had a nadir pass over the less-well photographed Northern Patagonian Ice Field in southern Andes between Chile and Argentina. The pass was in mid-morning with at least partial clearing expected. Using the long lens and try for detailed views of the glacial features, especially the western side, where visible),* and **S. Georgia/S. Sandwich** *(the South Georgia Island is an arching, mountainous and glaciated island that lies about 860 miles east-southeast of the Falkland Islands. The South Sandwich Islands form a separate island group and are to the southeast. Only partial clearing was expected at the time of the pass, but the crew was to try for mapping pass of the north coast of South Georgia. The pass was in early afternoon light, looking well right of track. Also looking for large icebergs reported in the vicinity)*.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 4:27m EST [= epoch]):
Mean altitude -- 351.4 km
Apogee height -- 354.0 km
Perigee height -- 348.7 km
Period -- 91.57 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0003921
Solar Beta Angle -- 32.9 deg (magnitude peaking)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 50 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57232

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
11/16/08 -- STS-126/Endeavour/ULF-2 docking; ~5:13pm
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch (nom.)
11/27/08 -- STS-126/Endeavour/ULF-2 undocking; 10:40am
11/29/08 -- STS-126/Endeavour/ULF-2 landing; ~2:10pm
11/30/08 -- Progress M-66/31P docking (nom.) – DC1 Nadir

12/07/08 -- Progress M-65/30P reentry (after 3 weeks autonomous flight for geophysical experiments)
12/18/08 -- Russian EVA-21
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch

Six-person crew on ISS

07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at http://www.hq.nasa.gov/osf/iss_reports/index.htm

STS-126 Launch – 11/14/08 – 7:55pm EST

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/14/08
Date:	Friday, November 14, 2008 1:41:58 PM
Attachments:	

ISS On-Orbit Status 11/14/08

All ISS systems continue to function nominally, except those noted previously or below.

Progress M-65/30P undocked successfully from the Service Module (SM) aft port on schedule at 11:20am EST. The first separation burn was on time at 11:23am, to be followed by a 30-sec retrograde burn at 2:25pm. 30P will remain in orbit in independent flight, continuing to phase out in front of the ISS (about 40 km per orbit) in order to support Russian non-ISS (geophysical) experiments. A 26-sec posigrade burn is scheduled for 11/17 (12:05pm). After its free flight, the ship will deorbit on 12/6 for destructive reentry over the Pacific Ocean. *[The separation appeared smooth, with no anomalous behavior reported by the crew. The undocking was done under US CMG (Control Moment Gyroscope) Momentum Management control, with Russian thrusters inhibited twice, first during the SM hooks opening activity at 9:40am and again at 11:17am for the undocking.]*

After the undocking, FE-1 Lonchakov switched the SM PrK (Transfer Tunnel)-to-aft port vestibule PEV (Pressure Equalization Valve, KVD) manually to its Closed position, a standard post-undocking procedure.

FE-2 Chamitoff conducted Part 1 of his FD180 session of the NASA/JSC experiment NUTRITION w/Repository, his sixth and last, for blood collection only, for which he had to forego exercising and food intake since yesterday for eight hours. Later today (~5:40pm), the FE-2 will set up the equipment for the 24-hour urine collections which start with the first void early tomorrow morning. Fincke assisted. *[After the CDR performed the phlebotomy, i.e., drawing Greg's blood samples (from an arm vein), the samples were first allowed to coagulate in the Repository for 20-30 minutes, then spun in the HRF RC (Human Research Facility/ Refrigerated Centrifuge) and finally placed in MELFI (Minus-Eighty Laboratory Freezer for ISS). No thruster activity was allowed during the blood drawing. The RC was later powered off after a temperature reset to limit wear on the compressor, and cleaned. The NUTRITION project is the most comprehensive in-flight study*

done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by supercold MELFI dewars), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]

Later, the FE-2 completed the PFE (Periodic Fitness Evaluation) protocol, a monthly 1.5-hr. procedure which checks up on blood pressure and electrocardiogram (ECG) during programmed exercise on the CEVIS (Cycle Ergometer with Vibration Isolation) in the US Lab. Readings were taken with the BP/ECG (blood pressure/electrocardiograph) and the HRM (heart rate monitor) watch with its radio transmitter. The CDR assisted as CMO (Crew Medical Officer). *[BP/ECG provides automated noninvasive systolic and diastolic blood pressure measurements while also monitoring and displaying accurate heart rates on a continual basis at rest and during exercise.]*

FE-1 Lonchakov set up the equipment for his first session with the Russian experiment MBI-18 DYKHANIE ("Respiration"), then undertook the session, controlled from the RSE-Med laptop and supported by ground specialist tagup. Yuri then closed down the hardware and stowed it. *[Dykhanie-1 uses two body belts (PG-T/thoracic, PG-A/abdominal), a calibrator, resistor, mouthpiece, etc., to study fundamental physiological mechanisms of the external breathing function of crewmembers under long-duration orbital flight conditions. During the experiment, physiological measurements are taken and recorded with a pneumotachogram, a thoracic pneumogram, an abdominal pneumogram, and pressure data in the oral cavity. All experimentally derived plus salient environmental data along with personal data of the subject are recorded on PCMIA card for return to the ground at end of the Expedition. Objectives include determining the dynamics of the relationship between thoracic (pectoral) and abdominal breathing function reserves and their realization potential during spontaneous breathing, the coordinated spontaneous respiratory movements in terms of thoracic and abdominal components of volumetric, time & rate parameters of spontaneous respiratory cycle, identification of the features of humoral-reflex regulation of breathing by dynamics of ventilation sensitivity of thoracic and abdominal components to chemoreceptor stimuli, etc. Overall, the experiment is intended to provide a better understanding of the basic mechanisms of pulmonary respiration/gas exchange gravitational relations of cosmonauts.]*

Chamitoff worked with Fincke on the BCAT-4 (Binary Colloidal Aggregation Test 4) experiment, handing it over to the CDR and passing on to Mike some of his findings of how to go about obtaining good imagery (sharp focus, perfectly square

alignment, excellent stability), then tore down and stored the hardware.

Fincke conducted another one of the periodic offloadings of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1054) with the collected water slated for processing. Two condensate samples were collected for return on ULF-2. *[Offloading began with 8.84 kg at 8:03am and ended 15 min later with 5.18 kg.]*

Gregory filled out the regular FFQ (Food Frequency Questionnaire), his 20th, on the MEC (Medical Equipment Computer). Mike Fincke's second FFQ session was completed yesterday from the discretionary "job jar" task list. *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

In the U.S. Airlock (A/L), Mike & Greg finished configuration preparations for the ULF-2 EVAs, along with some clean-up items from previous stowage issues. *[The crew removed the remaining charged batteries from the BSA (Battery Stowage Assembly) and conducted a final configuration check on the two EMUs (Extravehicular Mobility Units) and A/L. Since REBA (Rechargeable EVA Battery Assembly) #1004 exhibited a charge error yesterday, REBA #1005, a spare, will be used for ULF-2.]*

The CDR conducted the regular bi-monthly reboots of the OCA Router and File Server SSC (Station Support Computer) laptops.

Mike also replaced the battery of the prime CSA-CP (Compound Specific Analyzer-Combustion Products) unit (#1057). *[The CSA-CP is a passive cabin atmosphere monitor that provides quick response capability during a combustion event (fire). Its collected data are stored on a logger. Mike changed out the battery, then zero-calibrated the instrument (to eliminate drift in the combustion sensors). Following zero calibration, the prime unit's datalogger function was turned on to collect data at the SM Central Post as a spot check. After one hour, the datalogger was deactivated, with the prime CSA-CP remaining on for continuous passive sampling.]*

Mike & Yuri disassembled the equipment used for the recent R&R (Removal & Replacement) activities on the FGB's Komparus A3 system and stored it in the FGB. *["Komparus", which received a full complement of new avionics*

assemblies, is the FGB's communications portal. The Komparus (KIS) onboard radio command & measuring system activates and deactivates the FGB's radio telemetry system, with transmitters, commutators, external antennas, etc. of its two independently operating RTU-A and –B data telemetry subsystems.]

Lonchakov conducted some external reportage photography of the Soyuz TMA-13/17S spacecraft, docked at the FGB nadir port from the DC-1 Docking Compartment's EVA hatch 2 window. *[Using the NIKON D2X camera with wide angle and tele lenses, the FE-1 took digital pictures of the MLI (Multi-Layer Insulation) at various typical areas to assess the condition of the blankets, then copied the images to the RSK1 laptop.]*

The CDR & FE-2 had additional time reserved for hardware preparations and pre-packing for ULF-2. *[Activities included completion of critical portions of the IVA (Intravehicular Activity) Toolbox reconfiguration (clearing out tools from a rack which will be obstructed by cargo assembled for loading into the MPLM (Multi-Purpose Logistics Module), tearing down the Shuttle BOB (Breakout Box) for testing for non-intrusive flow meter ops, and doing some more pre-packing for return to Earth.]*

Yuri completed the routine daily servicing of the SM's SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

Greg had ~2.5 hrs reserved for another VolSci (Voluntary Science) program session with the SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellites) experiment. For today's test run, Chamitoff aimed at finishing a full iteration of algorithm development using two computer/algorithm-controlled satellites propelled by CO_2 gas, five beacons and one beacon tester. *[Today's run (Test Session 15), with ground team support, included the innovative use of "distributed computing" where the satellites perform low level path-following while high level path-determination happens in the crew's laptop, the ability of the crewmember to tune his controller interactively while working in a micro-G environment, and the implementation in hardware of the crewmember's algorithm.]*

The crew performed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2/PFE), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

At ~4:00am EST, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~5:40am, Yuri & Mike linked up with TsUP stowage specialists via S-band to conduct the weekly IMS tagup, discussing inventory & stowage issues, equipment locations and cargo transfers.

At ~9:35am, the FE-1 downlinked a PAO TV message of congratulation to TsUP-Moscow for the 60th birthday of Ivan Leonidovich Derevyanchenko, the General Director of "Conversia XXI" Closed Joint Stock Company (ZAO).

At ~10:00am, the CDR powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, & power supply) and conducted, at 10:05am, a ham radio exchange with three schools as part of International Education Week,- Poolesville High School, Poolesville, MD, Academia Cotopaxi, Quito/Ecuador, and Enloe Magnet High School, Raleigh, NC. *[Questions to Mike were uplinked beforehand. "How is oxygen brought into the ISS? Do you need to bring fresh oxygen or can you recycle the air?"; "What kinds of equipment are you required to work with on a regular basis, and what kind of knowledge or specialties must you have?"; "How do you prepare yourself, both physically and mentally, for the challenges of living in space?"; "If a compass won't work in space, so there is no north-south-east-west, how can you indicate direction?"; "How are scientists working to overcome the effects of radiation on a trip to Mars? Also, do you think that exposure to cosmic rays is a risk that you are comfortable taking?"; "What are the benefits of conducting experiments/studies in space?"; "We learned that in the ISS muscles atrophy and disuse of bones causes osteopenia. Will growing children ever be able to live in space and still grow? We especially wonder about the possibility of children in future colonies on the Moon or Mars."; "What are the differences between performing scientific experiments on earth as opposed to doing them on the space station? Also, what effects will these experiments have on our daily life here on earth?"; "What was the weirdest experiment ever performed on the space station?"; "We watched the ISS video on astronauts eating food and playing with floating spherical liquids. What would happen in a medical emergency on the ISS with spurting blood and other body fluids? How do you handle medical emergencies?"]*

At ~5:10pm, the ISS crew will have their regular weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC (Station Support Computer)]*.

Sleep Cycle Shift for ULF-2: Tonight's sleeptime for the crew will be delayed by 3.5 hrs, i.e., from 4:30pm to 8:00pm EST (wakeup tomorrow at 4:30am), beginning

a series of shifts to bring station life in line with STS-126 arrival.

STS-126/ULF-2/Endeavour Countdown Milestones:
The Launch countdown is proceeding nominally. Tanking began at about 11:00am EST.

- Launch Window Opens – 7:50pm
- In-Plane Launch Time – **7:55pm**
- Launch Window Closes – 8:00pm.
- Launch Weather Forecast:
    - Probability of KSC Weather Prohibiting Launch: 30%
    - Probability of KSC Weather Prohibiting Tanking: 0%

STS-126 Mission Highlights: STS-126/ULF-2/Endeavour, the 124th Shuttle mission and the 27th to the station, will be crewed by CDR Chris Ferguson, PLT Eric Boe, MS1 Donald Pettit, MS2/EV2 Steve Bowen, MS3/EV1 Heidemarie Stefanyshyn-Piper, MS4/EV3 Shane Kimbrough, and MS5/ Exp-18 FE-2 Sandra Magnus.

- ISS wake/sleep cycle will be shifted from 1:00am EST to 4:30am on FD2, then to 9:30am on FD3. The early undock time (10:32am) drives crew wakeup 2.5 hrs earlier, to 7:00am by FD14. The shift is completed by moving crew sleep 30 min earlier on FD4, and then one hour earlier each day on FD12 and 13.
- MPLM "Leonardo" will be installed on Node-2 on FD4; ingress same day just before Presleep. MPLM transfers start FD5 with four racks, followed on FD6 by 8 racks, including the Galley (/ER6).
- Focused Orbiter inspection is nominally planned for FD6. However, since the installed MPLM will obstruct a small area on the lower starboard wing for Focused inspection, MPLM berthing could be delayed to FD5 if the Debris Assessment Team, in reviewing the RPM imagery on the evening of FD3, identifies an area of concern associated with the starboard wing. Late inspection will be completed in its entirety after the Shuttle undocks on FD14. Endeavour will be undocking with the OBSS (Orbiter Boom Sensor System) on the SRMS (Shuttle Remote Manipulator System) in preparation for that inspection.
- Generic face-to-face handover time between Chamitoff & Magnus will be 12 hrs max; Gregory will remain on the ISS until the day before undocking and will be scheduled as an ISS crewmember.
- Endeavour will be powered by the SSPTS (Station-Shuttle Power Transfer System) from post-docking to just before undocking. During the mated mission when ISS solar arrays are feathered for attitude maneuvers and EVA operations, SSPTS may be powered off to maintain station power margin.
- 30 hrs are required for transfer ops to/from the Shuttle middeck and 105 hours for MPLM. With all the timelined activities and rack transfers

scheduled, ULF2 will be a highly choreographed transfer mission. The Shuttle crew has been thoroughly trained on the details of the choreography. In addition, each day a transfer message will be uplinked, listing specific items that need to be transferred that day due to operations requiring the items.

CEO photo targets uplinked for today were **Antarctic Ice Pack, S. Indian Ocean** *(the crew had a late morning pass over an area that weather satellite trends suggest at least partial clearing of the vicinity of the Antarctic Ice Pack. Looking well right of track for icepack, iceberg, and possible shoreline features),* **Kerguelen Archipelago** *(this glaciated and volcanic archipelago is located in the far south Indian Ocean nearly 2,000 miles SE of the island of Madagascar. Of primary interest is photography for monitoring of the rarely photographed ice field and glaciers located on the western end of the main island. ISS approach was from the W in mid-afternoon illumination and at least partial clearing was expected. Trying for a near-nadir mapping pass with the long lens, and then staying ready for the next target just seconds ahead),* **Heard Island** *(Heard Island is a bleak, uninhabited, and mountainous island located in the Southern Ocean; about two-thirds of the way from Madagascar to Antarctica. Its mountains are covered in glaciers and dominated by Mawson Peak, a 9,006 ft high complex volcano which forms part of the Big Ben massif. A long thin spit named "Elephant Spit" extends from the east of the island. ISS pass was in early afternoon light with weather satellite imagery suggesting partial clearing from the W. Looking well right of track and trying for oblique context views of this challenging target),* **Aurora Borealis** *(CREW REQUEST: Several passes during the day. Solar activity remains anomalously low and likewise Auroral displays will minimal. The crew was to look for displays obliquely left of track above the horizon),* and **Patagonian Glaciers** *(partial clearing, midday, nadir. Best pass of the day for lighting of this target area was at nadir over the southernmost portion of the Southern Patagonian Ice Field. Greg & Mike should have had midday illumination with at least partial clearing expected. CEO database already has numerous, excellent views of most of the beautiful, large glacier on the eastern flank of the Andes. This time the crew was to try for detailed views of the smaller, less-well photographed ones on the western flank).*

CEO photography can be studied at this “Gateway” website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 8:24am EST [= epoch]):
Mean altitude -- 351.4 km
Apogee height -- 353.9 km
Perigee height -- 348.9 km

Period -- 91.57 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0003737
Solar Beta Angle -- 32.8 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 53 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57219

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
11/14/08 -- STS-126/Endeavour/ULF-2 launch – MPLM Leonardo, LMC, PSSC; (7:55:34pm EST)
11/16/08 -- STS-126/Endeavour/ULF-2 docking; ~5:13pm
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch (nom.)
11/27/08 -- STS-126/Endeavour/ULF-2 undocking; 10:40am
11/29/08 -- STS-126/Endeavour/ULF-2 landing; ~2:10pm
11/30/08 -- Progress M-66/31P docking (nom.) – DC1 Nadir
12/07/08 -- Progress M-65/30P reentry (after 3 weeks autonomous flight for geophysical experiments)
12/18/08 -- Russian EVA-21
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/27/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/13/08
Date:	Thursday, November 13, 2008 3:12:49 PM
Attachments:	

ISS On-Orbit Status 11/13/08

All ISS systems continue to function nominally, except those noted previously or below. *L-1 for STS-126 (see below).*

Before breakfast and exercise, FE-2 Chamitoff performed his third PHS (Periodic Health Status) w/Blood Labs examination, using the U.S. PCBA (Portable Clinical Blood Analyzer). The second part of PHS, Subjective Clinical Evaluation, was performed later in the day. CDR Fincke assisted with the blood draw as CMO (Crew Medical Officer). All data were then logged on the MEC (Medical Equipment Computer) and the hardware stowed. *[The PHS exam, with PCBA analysis and clinical evaluation, is guided by special software (IFEP, In-Flight Examination Program) on the MEC laptop. While PCBA analyzes total blood composition, the blood's hematocrit is particularly measured by the Russian MO-10 protocol.]*

FE-1 Lonchakov conducted the periodic data collection and downlink on the long-term BIO-5 RASTENIYA-1 ("Plants-1") micro-gravity plant growth payload in the LADA/MIS (Module for the Investigation of Substrates) greenhouse. He also dried the substrate, took documentary photography and discussed the experiment with a ground specialist. *[RASTENIYA-1 researches growth and development of plants under spaceflight conditions in the LADA-14 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). The payload hardware includes a module (MIS/ Module for the Investigation of Substrates), the MIS control unit (BU), a nitrogen purge unit (BPA) and other accessories. During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. LADA consists of a wall-mounted growth chamber that provides long-term, ready access for crewmember interaction. It provides light and root zone control but relies on the cabin environmental control systems for humidity, gas composition, and temperature control. Cabin air is pulled into the leaf chamber, flows over the plants and vents through the light bank to provide both plant gas exchange and light bank cooling.]*

In final preparations for tomorrow's undocking of the Progress TM-65/30P cargo ship from the SM (Service Module) aft port (at 11:20am EST), Yuri Lonchakov dismantled and removed electronic equipment from the ship, specifically the US-21 matching unit, the cargo ship's LKT local temperature sensor commutator (TA251MB) of the BITS2-12 and its PZU-1M ROM (read-only memory) unit. *[When a Progress is undocked and jettisoned, the valuable electronics are retained, to be recycled on a future vehicle.]*

After yesterday's installation of the StM Docking Mechanism between Progress and the SM, Mike & Yuri had another hour reserved today for transferring more discarded cargo to 30P and stowing it according to detailed plan in the logistics spacecraft-turned-trash can, then reported the completed stowage operation to the ground. *[StM is the "classic" probe-and-cone type, consisting of an active docking assembly (ASA) with a probe (SSh), which fits into the cone (SK) on the passive docking assembly (PSA) for initial soft dock and subsequent retraction to hard dock. The ASA is mounted on the Progress' cargo module (GrO), while the PSA sits on the docking ports of the SM, FGB and DC1.]*

At ~10:15am EST, Yuri & Mike activated the 30P, disassembled the air duct in the hatchway to the SM, removed the threaded quick-disconnect (QD) screw clamps of the SM docking & internal transfer system (SSVP), which has rigidized the mating surfaces, closed hatches and initiated the standard one-hour leak check of the connecting vestibule (AO) to verify hermeticity.

Mike Fincke successfully installed an IWIS (Internal Wireless Instrumentation System) accelerometer RSU (Remote Sensor Unit) in the U.S. Airlock (A/L). The 25 ft cable will be routed on 11/15 to the A/L installation site. *[IWIS gathers data on structural dynamics in micro-G that cannot be obtained on the ground, for reducing conservatism in dynamic math models of ISS structure and forcing functions,. This would possibly allow relaxation of operational constraints that limit activities that cause structural loads (activities such as: crew-exercise, vehicle dockings, re-boost) and extension ISS life (15 years) through more accurate fatigue calculations. IWIS consists of a suite of software on the A31p SSC (Station Support Computer) laptops and four major hardware components: Strain Gauges, Accelerometers, Remote Sensor Unit (RSU), and Network Control Unit (NCU). Sensors are four 4 tri-axial accelerometers and eight strain gauges (only in Node-1). Each accelerometer needs one RSU and can be relocated if needed for better measurements. The NCU, which is also movable provides RF (radio-frequency) interface between IWIS software and RSUs, as well as time synchronization for all RSU clocks in the network prior to data collection.]*

In the COL (Columbus Orbital Laboratory) at location COL1O2, the CDR prepared for the upcoming ZSR (Zero-G Stowage Rack) relocation during the ULF-2 docked

period by installing a Pivot Pin Bracket, a K-BAR (Knee-Brace Assembly Replacement) capture mechanism and an ISPR(International Standard Payload Rack) Bonding Strap.

In the Kibo JLP (Japanese Logistics Pressurized Segment), at loc. P2, Fincke replaced the bottom Pivot Fitting with an ARIS (Active Rack Isolation System) Bottom Pivot Fitting from JPM (Japanese Pressurized Module), loc. F2.

The FE-1 completed the periodic collection of air samples in the SM & FGB using the AK-1M sampler kit, recording date, time & location. Kits and pump were then restowed.

In the A/L, Mike Fincke & Greg Chamitoff continued the EVA preparations, today –

- De-gassing three PWRs (Payload Water Reservoirs, #1024, 1025, 1026) to be used for the spacewalks *("De-gassing" = removing air bubbles from the PWR water that will be used to refill the EMU water tanks, by centripetal force, i.e., swinging the water bags to produce temporary "artificial gravity")*,
- Checking out three PGTs (Pistol Grip Tools, #1001, 1002, 1008) along with their batteries,
- Installing two METOX (Metal Oxide) CO_2 absorption canisters (#0016 in EMU 3003, #0019 in EMU 3018),
- Installing batteries on two helmet light/EMU TV assemblies, and
- Installing two REBAs (Rechargeable EVA Battery Assemblies) in EMUs 3003 & 3018.

The FE-2 removed the recorded video tape of the last SHERE (Shear History Extensional Rheology Experiment) run (9/30) from the MSG (Microgravity Science Glovebox) video drawer.

Gregory also completed the visual "T+2 Day" microbial (bacterial & fungal) analysis of the Week 3 potable water samples, collected on 11/11 from the SRV-K hot tap and two CWC (Contingency Water Containers) specimens and processed on board with the MCDs (Microbial Capture Devices) and coliform detection bags.

Mike meanwhile conducted the monthly 30-min PEP (Fire Detection & Suppression/ Portable Emergency Provisions) safety inspection/audit in the ISS modules. *[The IMS-supported inspection involves verification that PFEs (Portable Fire Extinguishers), PBAs (Portable Breathing Apparatus) and EHTKs (Extension Hose/ Tee Kits) are free of damage to ensure their functionality, and to track shelf life/life cycles on the hardware.* FE-2 Chamitoff conducted the monthly 30-min PEP (Fire Detection & Suppression/Portable Emergency Provisions) safety inspection/audit in the ISS modules. *[The IMS-supported inspection involves verification that PFEs*

(Portable Fire Extinguishers), PBAs (Portable Breathing Apparatus), and EHTKs (Extension Hose/Tee Kits) are free of damage to ensure their functionality, and to track shelf life/life cycles on the hardware. QDMA (Quick-Don Mask Assembly) harness inspection was not required today.]

FE-2 Chamitoff performed the regular 30-day inspection of the new AED (Automated External Defibrillator) in the CHeCS (Crew Health Care Systems) rack. *[The AED is a portable electronic device that automatically diagnoses the potentially life threatening cardiac arrhythmias of ventricular fibrillation and ventricular tachycardia in a patient. It then can treat them through defibrillation, i.e., the application of electrical therapy which stops the arrhythmia, allowing the heart to re-establish an effective rhythm. AEDs are generally either held by trained personnel who will attend events or are public access units which can be found in places including corporate and government offices, shopping centers, airports, restaurants, casinos, hotels, sports stadiums, schools and universities, community centers, fitness centers, health clubs and any other location where people may congregate.]*

For his return to Earth, Chamitoff prepared for gathering his personal exercise equipment, to be closed out after his last session on each device, and the gear to be used by his replacement, FE-2 Sandy Magnus. *[The equipment includes such items as HRM (Heart Rate Monitor) transmitter, HRM watch, HRM resupply kit, HRM chest strap, TVIS PCMCIA memory card, TVIS harness, and CEVIS ergometer shoes.]*

Fincke & Chamitoff had ~2:15 hrs reserved for more hardware pre-packing for return on STS-126.

In the RS (Russian Segment), the Elektron electrolysis machine, inactive for a while due the ongoing BITS2-12 onboard telemetry measurement system maintenance, was reactivated by the ground at ~11:55am EST at 32 amps, supported by Lonchakov by monitoring the external temperature of its secondary purification unit (BD) for the first 10 minutes of operations to ensure that there was no overheating. *[The gas analyzer used on the Elektron during nominal operations for detecting hydrogen (H_2) in the O_2 line (which could cause overheating) is not included in the control algorithm until 10 minutes after Elektron startup.]*

Fincke completed the weekly 10-min. CWC (Contingency Water Container) inventory as part of on-going WRM (Water Recovery & Management) assessment of onboard water supplies. Updated “cue cards” based on the crew’s water calldowns are sent up every other week. *[The new card (18-0006C) lists 23 CWCs (~771.1 L total) for the four types of water identified on board: technical*

water (151.3 L, for Elektron electrolysis), potable water (573.6 L, incl. 174.6 L currently off-limit because of Wautersia *bacteria), condensate water (7.0 L), waste/ EMU dump and other (39.2 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

FE-2 Chamitoff again had a one-hour period to himself for the regular crew departure preparations, working on the standard end-of-increment cleanup preparatory to his return to Earth later this month. *[It is usual for crewmembers to be granted reduced workdays for making their departure preparations, as their return date approaches.]*

Greg completed the routine daily servicing of the SM's SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

The FE-2 also conducted another checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the passageways SM PrK (Transfer Compartment)–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, and FGB GA–Node-1.

Later, Gregory completed a run with the MedOps experiment WinSCAT (Spaceflight Cognitive Assessment Tool for Windows), his fifth onboard session, by logging in on the MEC laptop and performing the psychological evaluation exercise on the laptop-based WinSCAT application. *[WinSCAT is a monthly time-constrained questionnaire test of cognitive abilities, routinely performed by astronauts aboard the ISS every 30 days before or after the PHS (periodic health status) test or on special CDR's, crewmembers or flight surgeons request. The test uses cognitive subtests that measure sustained concentration, verbal working memory, attention, short-term memory, spatial processing, and math skills. The five cognitive subtests are Coding Memory - Learning, Continuous Processing Task (CPT), Match to Sample, Mathematics, and Coding Delayed Recall. These WinSCAT subtests are the same as those used during NASA's long-duration bed rest studies.]*

Yuri performed the daily IMS (Inventory Management System) maintenance, updating/editing the standard IMS "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Chamitoff set up NASA's NUTRITION w/Repository experiment hardware for his

sixth and last session, starting tomorrow with the standard blood draw (phlebotomy), for which Greg has to start fasting 8 hrs before, i.e., tonight, with only water consumption allowed. *[The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by supercold MELFI dewars), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

The crew conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

STS-126/ULF-2/Endeavour L-0 (11/14) Launch Countdown Milestones:

- Tanking Weather Briefing – 10:00am EST
- Earliest Tanking Operations – 10:30am
- MMT on console – 4:30pm
- Launch Window Opens – 7:50pm
- In-Plane Launch Time – 7:55pm
- Launch Window Closes – 8:00pm.
- Launch Weather Forecast:
    - Probability of KSC Weather Prohibiting Launch: 30%
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STS-126 Mission Highlights: STS-126/ULF-2/Endeavour, the 124th Shuttle mission (the 27th to the station), will be crewed by CDR Chris Ferguson, PLT Eric Boe, MS1 Donald Pettit, MS2/EV2 Steve Bowen, MS3/EV1 Heidemarie Stefanyshyn-Piper, MS4/EV3 Shane Kimbrough, and MS5/ Exp-18 FE-2 Sandra Magnus.

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identifies an area of concern associated with the starboard wing. Late inspection will be completed in its entirety after the Shuttle undocks on FD14. Endeavour will be undocking with the OBSS (Orbiter Boom Sensor System) on the SRMS (Shuttle Remote Manipulator System) in preparation for that inspection.

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CEO photo targets uplinked for today were **Sydney, Australia** *(CREW REQUEST: The target is Australia's largest city [estimated population 4.28 million] and the state capital of New South Wales. It is also a major seaport located on the southeast coast. ISS pass was in late afternoon sun with fair weather expected. As ISS approached the coast from the SW, the crew was to shoot left of track),* **S. Georgia/ S. Sandwich** *(the South Georgia Island is an arching, mountainous and glaciated island that lies about 860 miles ESE of the Falkland Islands. The South Sandwich Islands form a separate island group and are to the SE. Only partial clearing was expected at the time of the pass, but Mike & Greg were to try for a mapping pass of the north coast of South Georgia. ISS pass was just after midday, looking well right of track. Looking also for large icebergs reported in the vicinity),* **Lake Eyre, Australia** *(this large, mostly dry lakebed is a landmark from space in South Australia. It is the lowest point of a basin that drains an area about one-seventh of the continent. This makes it a good indicator of long-term rainfall trends in east-central Australia. As ISS approached the area from the NW in early morning light, the crew was to look well right of track for the lakebed with perhaps a darker flow of water from the north. Using the short lens for context views and trying to acquire most or all of the lakebed in a single frame. Then getting ready for the next target Canberra in just over three minutes),* **Canberra, Australia** *(the capital city of Australia is situated inland in the mountains and hills of southeastern Australia. ISS had a fair weather pass in mid-morning light as it approached from the NW. Using the long lens settings and looking just left of track for a detailed mapping of the*

urban area).

CEO photography can be studied at this “Gateway” website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

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Apogee height -- 354.0 km
Perigee height -- 349.0 km
Period -- 91.57 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0003707
Solar Beta Angle -- 32.1 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 61 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57203

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
11/14/08 -- STS-126/Endeavour/ULF-2 launch – MPLM Leonardo, LMC, PSSC; (7:55:34pm EST)
11/14/08 -- Progress M-65/30P undocking – 11:20am EST (phys. sep.)
11/16/08 -- STS-126/Endeavour/ULF-2 docking; ~5:13pm
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch (nom.)
11/27/08 -- STS-126/Endeavour/ULF-2 undocking; 10:40am
11/29/08 -- STS-126/Endeavour/ULF-2 landing; ~2:10pm
11/30/08 -- Progress M-66/31P docking (nom.) – DC1 Nadir
12/07/08 -- Progress M-65/30P reentry (after 3 weeks autonomous flight for geophysical experiments)
12/18/08 -- Russian EVA-21
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD

05/27/09 -- Soyuz TMA-15/19S launch

Six-person crew on ISS

07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/12/08
Date:	Wednesday, November 12, 2008 12:05:36 PM
Attachments:	

ISS On-Orbit Status 11/12/08

All ISS systems continue to function nominally, except those noted previously or below.

Major activities for CDR Fincke & FE-2 Chamitoff today were EVA preparations for the ULF-2 spacewalks. Working in the U.S. "Quest" Airlock, Mike & Greg –

- Terminated the recharging of the REBA (Rechargeable EVA Battery Assemblies), HL (Helmet Light), PGT (Pistol Grip Tool), and EMU (Extravehicular Mobility Unit) batteries in the BSA (Battery Stowage Assembly), most of which will be used for EVA-1,
- Initiated the second recharge (of two) on the REBA, HL and EMU batteries,
- Set up EMUs #3018 & #3003 with their SCUs (Service & Cooling Umbilicals) and initiated the standard 1hr scrubbing process on the spacesuits' cooling water loops, filtering ionic and particulate matter (via a 3-micron filter),
- Conducted the regular checkout for the two spacesuits, and
- Terminated the scrubbing, shutting down the suit fans and oxygen (to limit run time), disassembled the EMU water processing kit and stowed the equipment.

Afterwards, Fincke & Chamitoff reviewed uplinked summaries of EVA tasks, EVA systems and DOUG (Dynamic Onboard Ubiquitous Graphics) files for ULF-2. A 30-min tagup with STS-126 crewmembers on the ground followed for reviewing the EVA tasks.
[Four EVAs are planned during the mission. MS2 (Bowen), MS3 (Piper), & MS4 (Kimbrough) will rotate all EVAs. General EVA tasks are:

- ***EVA-1*** *(FD5) – NTA (Nitrogen Tank Assembly) transfer to Shuttle PLB, FHRC (Flex Hose Rotary Coupler) transfer to ESP-3, EFBM Cover Removal, Stbd SARJ (Solar Array Rotary Joint) Cleaning/TBA (Trundle Bearing Assembly) R&R.*
- ***EVA-2*** *(FD7) – CETA Cart Relocation, LEE A Lubrication, Stbd SARJ Cleaning/TBA R&R.*

- ***EVA-3*** *(FD9) – SARJ cleaning/TBA R&R.*
- ***EVA-4*** *(FD11) – Port SARJ lubing, EFBM cover install, ETVCG Install, JLP GPS Antenna Install, JEM Handrails/WIFs Install, IR and Digital Imagery of S1/P1 Radiators.]*

Fincke completed the routine daily servicing of the SM's SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

Mike also conducted the periodic checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the passageways SM PrK (Service Module Transfer Compartment)–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, and FGB GA–Node-1.

Lonchakov performed the daily IMS (Inventory Management System) maintenance, updating/editing the standard IMS "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Yuri also collected the periodic readings of potentially harmful atmospheric contaminants in the SM, using the CMS (Countermeasure System), a component of the SKDS GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, today using preprogrammed microchips to measure for o-Xylol (1,2-Dimethylbenzol, C_8H_{10}) and Methyl-Mercaptan (Methanethiol, CH_4S).

Continuing preparations for Progress M-65/30P undocking on 11/14 (Friday), Lonchakov & Fincke installed the StM Docking Mechanism between Progress and the SM aft end. *[StM is the "classic" probe-and-cone type, consisting of an active docking assembly (ASA) with a probe (SSh), which fits into the cone (SK) on the passive docking assembly (PSA) for initial soft dock and subsequent retraction to hard dock. The ASA is mounted on the Progress' cargo module (GrO), while the PSA sits on the docking ports of the SM, FGB and DC1.]*

The FE-1 had another 4 hrs reserved for loading trash and other disposal cargo onto 30P.

In preparation for STS-126/ULF-2 arrival and the MPLM (Multi-Purpose Logistics Module) "Leonardo" berthing with the SSRMS (Space Station Remote Manipulator

System), Chamitoff re-installed the CBCS (Centerline Berthing Camera System) at the Node-2 Nadir hatch, remated the camera cable connection and photo-documented the setup. *[CBCS had been installed on 10/22 but was temporarily removed on 10/27 to make room for the EarthKAM (EK) payload for a week of student photo ops. Leonardo will be transferred from the Shuttle cargo bay with the SSRMS on FD4 and berthed at the Node-2 Nadir Port CBM (Common Berthing Mechanism), followed immediately by activation and initial crew ingress.]*

Gregory broke out and set up the equipment for tomorrow's scheduled U.S. PHS (Periodic Health Status) w/Blood Labs exam, a clinical evaluation of Chamitoff as subject, with Mike Fincke assisting as CMO (Crew Medical Officer) for the blood sampling part. *[Today's task included an electronic function test and control analysis of the blood lab equipment, viz., the PCBA (Portable Clinical Blood Analyzer), which was then temporarily stowed.]*

The FE-2 also had an hour for freeing space and relocating/consolidating cargo stowage to make room in the COL (Columbus Orbital Laboratory), JLP (Japanese Logistics Pressurized Segment), and Node-2 as required, for new racks coming up with ULF-2. Moves were to be logged in the IMS.

Afterwards, Greg worked on more hardware prepacking for return on ULF-2, going by revised uplinked Prepack Lists as reference.

The FE-2 again had a one-hour period to himself for the regular crew departure preparations, working on the standard end-of-increment cleanup preparatory to his return to Earth later this month. *[It is usual for crewmembers to be granted reduced workdays for making their departure preparations, as their return date approaches.]*

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

At ~9:15am EST, Fincke & Chamitoff participated in a live 10-min. PAO interview with The Pittsburgh Tribune-Review (Mike Cronin).

At ~5:45pm, Gregory is scheduled for his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

New jobs added to the voluntary U.S. "job jar" task list for Fincke & Chamitoff are –

- the periodic PEP (Fire Detection & Suppression/Portable Emergency

Provisions) inspection, and

- tearing down and testing the Shuttle BOB (Breakout Box) for non-intrusive flow meter operations.

STS-126/ULF-2/Endeavour L-2 Status: The L-2 Day meeting of the MMT (Mission Management Team) this morning gave a "GO" for proceeding with the STS-126 launch countdown. No significant issues are being worked and there will not be an L-1 Day MMT meeting.

- *L-0 (11/14) Launch Countdown Milestones:*
  - *Tanking Weather Briefing – 10:00am EST*
  - *Earliest Tanking Operations – 10:30am*
  - *MMT on console – 4:30pm*
  - *Launch Window Opens – 7:50pm*
  - *In-Plane Launch Time – 7:55pm*
  - *Launch Window Closes – 8:00pm.*

- *Launch Weather Forecast:*
  - *Probability of KSC Weather Prohibiting Launch: 40%*
  - *Probability of KSC Weather Prohibiting Tanking: 0%*
  - *Primary Concerns: Showers within 20 NM of the SLF (Shuttle Landing Facility), cumulus clouds*

STS-126 Mission Highlights: STS-126/ULF2/Endeavour, the 124th Shuttle mission (the 27th to the station), will be crewed by CDR Chris Ferguson, PLT Eric Boe, MS1 Donald Pettit, MS2/EV2 Steve Bowen, MS3/EV1 Heidemarie Stefanyshyn-Piper, MS4/EV3 Shane Kimbrough, and MS5/ Exp-18 FE-2 Sandra Magnus.

- ISS wake/sleep cycle will be shifted from 1:00am EST to 4:30am on FD2, then to 9:30am on FD3. The early undock time (10:32am) drives crew wakeup 2.5 hrs earlier, to 7:00am by FD14. The shift is completed by moving crew sleep 30 min earlier on FD4, and then one hour earlier each day on FD12 and 13.
- MPLM “Leonardo” will be installed on Node-2 on FD4; ingress same day just before Presleep. MPLM transfers start FD5 with four racks, followed on FD6 by 8 racks, including the Galley (ER6).
- Focused Orbiter inspection is nominally planned for FD6. However, since the installed MPLM will obstruct a small area on the lower starboard wing for Focused inspection, MPLM berthing could be delayed to FD5 if the Debris Assessment Team, in reviewing the RPM imagery on the evening of FD3, identifies an area of concern associated with the starboard wing. Late inspection will be completed in its entirety after the Shuttle undocks on FD14. Endeavour will be undocking with the OBSS (Orbiter Boom Sensor System) on the SRMS (Shuttle Remote Manipulator System) in preparation

for that inspection.

- Generic face-to-face handover time between Chamitoff & Magnus will be 12 hrs max; Gregory will remain on the ISS until the day before undocking and will be scheduled as an ISS crewmember.
- Endeavour will be powered by the SSPTS (Station-Shuttle Power Transfer System) from post-docking to just before undocking. During the mated mission when ISS solar arrays are feathered for attitude maneuvers and EVA operations, SSPTS may be powered off to maintain station power margin.
- 30 hrs are required for transfer ops to/from the Shuttle middeck and 105 hours for MPLM. With all the timelined activities and rack transfers scheduled, ULF2 will be a highly choreographed transfer mission. The Shuttle crew has been thoroughly trained on the details of the choreography. In addition, each day a transfer message will be uplinked, listing specific items that need to be transferred that day due to operations requiring the items.

No CEO photo targets uplinked for today (due to yesterday's holiday).

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 7:47am EST [= epoch]):
Mean altitude -- 351.5 km
Apogee height -- 354.1 km
Perigee height -- 349.0 km
Period -- 91.57 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0003768
Solar Beta Angle -- 30.8 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 60 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57187

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11/14/08 -- Progress M-65/30P undocking
11/16/08 -- STS-126/Endeavour/ULF-2 docking; ~4:56pm
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch (nom.)
11/27/08 -- STS-126/Endeavour/ULF-2 undocking; 10:32am

11/29/08 -- STS-126/Endeavour/ULF-2 landing; ~2:01 pm
11/30/08 -- Progress M-66/31P docking (nom.) – DC1 Nadir
12/18/08 -- Russian EVA-21
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
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02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch

Six-person crew on ISS

07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/11/08
Date:	Tuesday, November 11, 2008 2:47:39 PM
Attachments:	

ISS On-Orbit Status 11/11/08

All ISS systems continue to function nominally, except those noted previously or below. *Veterans Day Holiday.*

Before breakfast & first exercise, CDR Fincke, FE-1 Lonchakov and FE-2 Chamitoff completed a full session with the Russian crew health monitoring program's medical assessment MO-9/Biochemical Urinalysis. Afterwards, the FE-1 closed out and stowed the Urolux hardware. *[MO-9 is conducted every 30 days (and also before and after EVAs) and is one of five nominal Russian medical tests adopted by NASA for U.S. crewmembers for IMG PHS (Integrated Medical Group/Periodic Health Status) evaluation as part of the "PHS/Without Blood Labs" exam. The analysis uses the sophisticated in-vitro diagnostic apparatus Urolux developed originally for the Mir program. Afterwards, the data are entered in the MEC (Medical Equipment Computer)'s special IFEP software (In-Flight Examination Program).]*

The CDR collected failed lighting system BBAs (Baseplate Ballast Assemblies) from the Kibo JLP (Japanese Logistics Pressurized Segment, loc. 1PA2) and JPM (Japanese Pressurized Module, loc. 1OF2), and stowed them for return on STS-126/ULF-2.

In JLP, Fincke deinstalled a soft dummy panel at loc. 1P1 for temporary stowage, then removed a hard dummy panel from loc. 1F1 and installed it at 1P1, replacing it at 1F1 with the soft panel and tightening its four fasteners. After the swap, Mike also was to check on available stowage space at the 1P1, A1 & S1 rack areas for ULF-2 cargo.

Later, Mike conducted the CTB (Cargo Transfer Bag) T1/T2 contents audit carried yesterday on the voluntary “job jar” task list, retrieving cables to be retained aboard prior to CTB T2’s disposal on ULF-2 and verifying availability of BDS (Backup Drive System) hardware for setting up the Robotics BDS in the JPM after ULF-2 departure.

Also in preparation for the ULF-2 docked period, the CDR & FE-2 –

- Worked another ~3 hrs on hardware prepacking for return to Earth,
- Spent ~30 min. in the US Airlock checking out two SAFER (Simplified Aid for EVA Rescue) units (#1004 & #1007) for the ULF-2 spacewalks, and
- Readied two sets of retention nets for installation in the JLP (intended to protect shell heaters in the empty rack bays by enclosing stowed cargo against the JLP Hard Dummy Panels during ULF2).

FE-1 Lonchakov had 4 hrs reserved for loading trash and other disposal cargo onto Progress 30P.

FE-2 Chamitoff conducted "Exp-18 Week 3" sampling of potable water for chemical and microbial analysis from the SVO-ZV tap and the SRV-K Warm tap, the latter after preliminary heating of the water (three heating cycles) and flushing.
[Gregory collected two 450 mL samples (for postflight microbial analysis), one 225 mL sample (for inflight microbial analysis) and two 750 mL samples (for postflight chemical analysis) from each of three ports (SRV-K hot, SRV-K warm, SVO-ZV) for return on STS-126/ULF2. The flush water, collected in three small waste water bags, was then reclaimed for technical use. For the in-flight chemistry/microbiology analysis, Greg used MCDs (microbial capture devices) from the U.S. WMK (water microbiology kit) for treatment/processing after no more than 6 hours of the collection (done ~12:25pm EST). Sample analysis included subsequent processing of water samples in the MWAK (microbial water analysis kit) for inflight coliform bacteria (Escherichia coli) detection (done ~12:45pm). Results of the on-board processing will be available after a two-day incubation period, in case of the MWAK after 4-6 days of incubation.]

CDR Fincke worked on the WDS (Water Distribution System) in the US Lab, tearing it down to make room for the upcoming installation of new ECLSS (Environment Control & Life Support Systems) racks arriving on ULF-2.

For the purpose of testing the main TORU (Teleoperator Control System) receiver on the mated Progress M-65/30P, CDR Fincke & FE-1 Lonchakov worked with ground specialists via VHF on DO15 (Daily Orbit 15, VHF coverage 11:38-11:47am) on the standard vehicle-to-vehicle TORU checkout between the Service Module (SM) and the Progress 30P cargo ship docked at the SM aft port. TORU was activated on 11:10am. Progress thrusters (DPO) were inhibited and not involved.
[Crew activities focused on TORU activation, inputting commands via the RUO Rotational Hand Controller and close-out ops. TORU lets an SM-based crewmember perform the approach and docking of automated Progress vehicles in case of failure of the automated KURS system. Receiving a video image of the approaching ISS, as seen from a Progress-mounted docking television camera ("Klest"), on a color monitor ("Simvol-Ts", i.e. "symbol center") which also displays

an overlay of rendezvous data from the onboard digital computer, the crewmember steers the Progress to mechanical contact by means of two hand controllers, one for rotation (RUO), the other for translation (RUD), on adjustable armrests. The controller-generated commands are transmitted from the SM's TORU control panel to the Progress via VHF radio. In addition to the Simvol-Ts color monitor, range, range rate (approach velocity) and relative angular position data are displayed on the "Klest-M" video monitor (VKU) which starts picking up signals from Progress when it is still approximately 7 km away. TORU is monitored in real time from TsUP over Russian ground sites (RGS) and via Ku-band from Houston, but its control cannot be taken over from the ground. Progress M-66/31P and all subsequent vehicles which carry more advanced avionics equipment, will require new TORU procedures.]

In the SM, Yuri performed the routine daily servicing of the SOZh system (ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

The FE-1 also conducted the daily IMS (Inventory Management System) maintenance, updating/editing the standard IMS "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Gregory again had a one-hour period to himself for the regular crew departure preparations, working on the standard end-of-increment cleanup preparatory to his return to Earth later this month. *[It is usual for crewmembers to be granted reduced workdays for making their departure preparations, as their return date approaches.]*

The FE-2 also completed another one of the periodic inspections of the RED (Resistive Exercise Device) canister cords and accessories, currently done every two weeks.

The crew had their periodic PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Greg at ~10:30am, Mike at ~11:15am, and Yuri at ~ 12:35pm EST.

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

At ~2:30pm EST, Yuri Lonchakov headed the crew in supporting a live PAO TV downlink with messages of greetings for two events: (1) the Russian Youth Aerospace Association "Soyuz", celebrating its 20th Anniversary on 11/14 at MSTU (N.E. Bauman Moscow State Technical University), and (2) RTTV channel "Russia Today" which will have an extensive coverage of the 10th Anniversary of the first ISS module launch and will air the ISS interview on 11/20. *["…Congratulations on the 20th Anniversary of the Russian Youth Aerospace "Soyuz" Association! We are very pleased to take part in this festivity. We salute our young people – future cosmonauts, designers, engineers. Guys, remember, you are the ones who will have to conquer the space, explore planets, and lead the way to the stars….". (Note: Seven new cosmonaut candidates currently in training are Soyuz Association graduates).]*

CEO photo targets uplinked for today were **Lakes, Bolivian Andes** *(climates of the central Andes change rapidly from wet tropical to arid subtropical. Lakes reflect these climates exactly: Lake Titicaca in the north is a permanent freshwater lake; Lake Poopo is brackish and sometimes dries up completely during El Niño events; and Salar Uyuni is almost always dry, its salt floor appearing bright white from low Earth orbit, the crew's prime visual cue [salar is a dry lake with a salt bed]. Between El Niño events [as now] Uyuni floods over part of its surface to a few feet in depth and Lake Poopo usually expands [a trend opposite to the heavy rains and floods of the Pacific coastline during El Nino events]; general views were requested looking right of track to document the present water levels of Salar Uyuni and Lake Poopo; during the ice ages of the recent geologic past, the entire Uyuni–Poopo basin was repeatedly turned into a single permanent lake as the atmospheric circulation settled into a different equilibrium state. The last permanent lake [17,000 years ago] was as large as Lake Michigan, and the weight of its water is known to have depressed the land surface at the north end by 20–40 m. Future requests for photography will focus on shoreline details of the ancient lakes).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/10/08
Date:	Monday, November 10, 2008 1:51:03 PM
Attachments:	

ISS On-Orbit Status 11/10/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 3 of Increment 18.*

CDR Fincke ended his FD30 (Flight Day 30) session with the NASA/JSC experiment NUTRITION w/Repository, his second, by collecting a final urine sample upon wakeup for storage in the MELFI (Minus-Eighty Laboratory Freezer for ISS). The sampling kit was then stowed away. Mike's next activity with this experiment will be the FD60 session. *[The current NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

The CDR, FE-1 Lonchakov & FE-2 Chamitoff began their workday before breakfast with the periodic session of the Russian biomedical routine assessment PZEh-MO-7/Calf Volume Measurement. *[Calf measurements (left leg only) are taken with the IZOG device, a custom-sewn fabric cuff that fits over the calf, using the knee and lower foot as fixed reference pints, to provide a rough index of deconditioning in zero-G and effectiveness of countermeasures.]*

Fincke worked on the SM ASU (Service Module Toilet System), performing the monthly 30-min. maintenance/servicing of the facility by changing out replaceable ASU parts with new components, i.e., the urine receptacle (MP) and a filter insert (F-V). The old parts were discarded as trash.

Afterwards, Mike closed out the CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) payload by removing the CSI-02 (CGBA Science Insert #2) hardware from it for return to Earth. The CDR also accessed CGBA-4, retrieving the CSI-01

stowage bag and packing the SHERE FM (Shear History Extensional Rheology Experiment Fluid Module) stowage tray for return on ULF-2.

Lonchakov conducted a 3-hr. task of servicing the RASTENIYA-1 (Plants-1) MIS LADA payload, moistening the substrate and discussing the experiment with a ground specialist. *[Rasteniya-1 researches growth and development of plants under spaceflight conditions in the LADA-14 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). The payload hardware includes a module (MIS/Module for the Investigation of Substrates), the MIS control unit (BU), a nitrogen purge unit (BPA) and other accessories. During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. LADA consists of a wall-mounted growth chamber that provides long-term, ready access for crewmember interaction. It provides light and root zone control but relies on the cabin environmental control systems for humidity, gas composition, and temperature control. Cabin air is pulled into the leaf chamber, flows over the plants and vents through the light bank to provide both plant gas exchange and light bank cooling.]*

In ESA's COL (Columbus Orbital Laboratory), Chamitoff removed the ERNObox payload from its location (at COL1O2) and re-installed it at a different location (COL Port Cone aft/module side). *[The ERNO (Entwicklungsring Nord) box contains various radiation devices, including LEON-2 CPU (Central Processing Unit) developed by ATMEL/France and ESA, new memory devices, large SRAM (Static Random Access Memory)-based FPGAs (Field-Programmable Gate Arrays), and MEMS (Microelectromechanical Systems) sensors. The radiation-hardened LEON-2 microprocessor chip is the first implementation of a LEON CPU-core in silicon, with SPARC compliance. SPARC (Scalable Processor Architecture), invented by Sun Microsystems Inc., is an open set of technical specifications that any person or company can license and use to develop microprocessors and other semiconductor devices based on published industry standards.]*

Afterwards, Gregory worked on the COL ventilation system, inspecting and cleaning the RGSH (Return Grid Sensor Housing) on the PD Panel, module side.

Lonchakov used CWCs (Contingency Water Containers) #1069 & #1030 in the RS (Russian Segment) for the periodic (about twice a month) replenishing of the Elektron oxygen generator's water supply for electrolysis, filling the KOV thermal loops' EDV container. Once filled, the EDV was connected to the BPK transfer pump for processing. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they*

could cause Elektron shutdown.]

Yuri had another 3 hrs. reserved for a BITS2-12 (onboard telemetry measurement system) related job, deinstalling five electronic components from the PTsB Central Processor Subsystem (Monoblock TA968MA) which Sergey Volkov had removed & stowed on 9/24, then moving the box to the Lab for return on ULF-2. The activity was supported by ground specialist tagup. *[The removed components were stowed as spares except one of them (TA734 BPL 2A) which was returned to the excessed PTsB container. BITS is the primary telemetry downlink path for both FGB and SM parameters, designed to collect, record and transmit measurement data to the ground concerning the operation of all RS onboard systems, science hardware, and data concerning the crew's health status. BITS also processes and relays to the ground the digital data arrays formed by various science hardware and the BVS (Onboard Computer System). The TA968MA is the primary device that forms the BITS operating modes.]*

Mike Fincke undertook the periodic relocation of the TEPC (Tissue Equivalent Proportional Counter) detector assembly, the primary radiation measurement tool in the ISS, from the SM (Panel 338) to Node-2 (loc. PD3/2) and connected it to the UOP3 power outlet panel. *[TEPC had been relocated to the SM by Chamitoff on 9/30, after having been in the Kibo JPM (JEM Pressurized Module) from 8/24.]*

After reviewing 400 & 800mm-lens training imagery taken on 11/6 for the STS-126/ ULF-2 Endeavour RPM (R-bar Pitch Maneuver) on 11/16, Fincke & Chamitoff tagged up with ground specialists to discuss the ground-analyzed photo/video imagery. *[The RPM drill prepares crewmembers for the bottom-side mapping of the Orbiter at the arrival of the Shuttle. During the RPM at ~600 ft from the station, the "shooters" have only ~90 seconds for taking high-resolution digital photographs of all tile areas and door seals on Endeavour, to be downlinked for launch debris assessment. Thus, time available for the shooting will be very limited, requiring great coordination between the two headset-equipped photographers and the Shuttle pilot.]*

Greg & Mike had about 4 hrs. between them for more hardware prepacking for ULF-2, using revised uplinked Prepack Lists as reference.

The CDR also spent about an hour loading disposal cargo & trash onto Progress M-65/30P.

Lonchakov meanwhile completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking & servicing the ASU toilet facilities, replacing the KTO & KBO solid waste containers, replacing of EDV-SV*

waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available. Tests of IP-1 air flow sensors, smoke detectors, time & synchronization etc. are also performed daily via SPP (Automated Onboard Sequencer) control.]

Working from his discretionary "as time permits" task list, Yuri also performed the regular daily job of IMS (Inventory Management System) "delta file" updating/editing for the weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

In the US Airlock (A/L), Fincke terminated the discharge of EMU (Extravehicular Mobility Unit) battery #2073 in BC4 (Battery Charger 4). In preparation for the STS-126 spacewalks, Mike then initiated recharge procedures on REBA (Rechargeable EVA Battery Assemblies), HL (Helmet Light), PGT (Pistol Grip Tool), and EMU (Extravehicular Mobility Unit) batteries in BC1/2/3/4 of the BSA (Battery Stowage Assembly). *[This is the first of two recharges required to prepare all EVA batteries for ULF-2. Today's activity was also to confirm whether BC1 is still producing any sounds different from BCs 2-4 during power-up and charging. No unusual noise was heard, and BC1 was also used for charging.]*

Greg Chamitoff had a one-hour period to himself for the regular crew departure preparations, working on the standard end-of-increment cleanup preparatory to his return to Earth on 11/29. *[It is usual for crewmembers to be granted reduced workdays for making their departure preparations, as their return date approaches.]*

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

At ~2:55am EST, CDR Fincke powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, & power supply) and conducted, at 3:00am, a ham radio exchange with Anderson's Creek Primary School, Warrandyte, Victoria, Australia. *[Anderson's Creek Primary School is situated 30 km NE of Melbourne and has over 340 students. It is nestled in a tranquil natural environment. The school is surrounded by native vegetation that invites parrots, galahs and the sound of laughing kookaburras. Its architectural design encourages cooperative teaching and is very much a community based school which places great importance on the partnership between parents and teachers. There is a strong emphasis on the use of information technology in the classrooms. Warrandyte is a small township of around 14,000 people, situated on the Yarra River and surrounded by beautiful State Parks. The town is known for its painters and potters. Gold mining played an important role in the establishment of*

Warrandyte. The very first payable gold for Victoria was discovered here in 1851, at Anderson's Creek, which runs behind the school. This is why the school logo is a poppet head. Questions to Mike were uplinked beforehand. "What is your latest discovery?"; "Do your five senses work as well in space?"; "Is everything slower, or faster, in space?"; "Is your speech affected in space?"; "How many people are with you? Do you get on each others nerves?"; "What happens if you need to wear glasses in space?"; "Would a thermometer work in space?"; "How does a space ship move in space when there are no particles to push against?"; "When you exercise, do you lose the same amount of fat as you would on earth?"; "What time zone do you use? Is there special space time?"; "Have you been hit by a meteor? What happens if you are?"]

At ~2:35pm, Mike Fincke had a CDE (Crew Discretionary Conference) via Ku-band/ video and S-band/audio.

Progress Propellant Purge: Preparatory to the Progress 30P departure on 11/14, TsUP-Moscow conducted the standard propellant line purge on the TM-65 cargo spacecraft's fuel (12:48pm) and oxidizer lines (2:21pm). For the events, ISS attitude control authority was handed over to RS thrusters at 12:30pm, to be returned to US Momentum Management at ~2:55pm. For the thruster firings, Gregory verified closure of the protective window shutters in the Lab and JPM.

Lighting Maintenance: Over the weekend, the crew restored function to GLAs (General Luminaire Assemblies) in the A/L and JLP (JEM Logistics Pressurized Segment). *[A BBA (Baseplate Ballast Assembly) was relocated from the Lab (loc.1OS6) to replace a failed BBA in the A/L (loc.1OA1). Since there are no spare BBAs on orbit, additional BBAs will be scavenged from MPLM (Multi-Purpose Logistics Module) Leonardo on ULF-2. Three LHAs (Lamp Housing Assemblies) that had been removed from ATV "Jules Verne" were used to replace three failed LHAs in the JLP.]*

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 8:30am EST [= epoch]):
Mean altitude -- 351.7 km
Apogee height -- 354.1 km
Perigee height -- 349.3 km
Period -- 91.57 min.
Inclination (to Equator) -- 51.64 deg

Eccentricity -- 0.0003585
Solar Beta Angle -- 26.7 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 105 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57156

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
11/14/08 -- STS-126/Endeavour/ULF-2 launch – MPLM Leonardo, LMC, PSSC; (7:55pm EST)
11/14/08 -- Progress M-65/30P undocking
11/16/08 -- STS-126/Endeavour/ULF-2 docking; ~4:56pm
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch (nom.)
11/27/08 -- STS-126/Endeavour/ULF-2 undocking; 10:32am
11/29/08 -- STS-126/Endeavour/ULF-2 landing; ~2:01 pm
11/30/08 -- Progress M-66/31P docking (nom.) – DC1 Nadir
12/18/08 -- Russian EVA-21
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/09/08
Date:	Sunday, November 09, 2008 12:45:25 PM
Attachments:	

ISS On-Orbit Status 11/09/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – rest day for CDR Fincke, FE-1 Lonchakov, FE-2 Chamitoff. Ahead: Week 3 of Increment 18.*

After wakeup (1:00am EST), FE-2 Chamitoff again downloaded the accumulated data of the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment from his Actiwatch to the HRF-1 (Human Research Facility 1) laptop as part of his final week-long session with SLEEP. *[To monitor the crewmember's sleep/wake patterns and light exposure, Greg wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition and uses the payload software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list. This is Week 3 of 3 for the FE-2.]*

CDR Fincke's first activity this morning was to start on his Flight Day 30 session with the NASA/JSC experiment NUTRITION w/Repository. This was an all-day session, the second for Mike, of collecting urine samples several times for 24 hrs, to continue through first void tomorrow morning. *[After performing phlebotomy with the help of FE-2 Chamitoff, i.e., drawing blood samples (from an arm vein), the samples were first allowed to coagulate in the Repository for 20-30 minutes, then spun in the HRF RC (Human Research Facility/Refrigerated Centrifuge) and finally placed in MELFI (Minus-Eighty Laboratory Freezer for ISS). No thruster activity was allowed during the blood drawing. The RC was later powered off after a temperature reset to limit wear on the compressor, and cleaned. The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by*

supercold MELFI dewars), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]

For FE-1 Lonchakov it was time again for recharging the Motorola Iridium-9505A satellite phone brought up on Soyuz 17S, a monthly routine job and his second time. *[After retrieving it from its location in the TMA-13/17S Descent Module (BO), Yuri initiated the recharge of its lithium-ion battery, monitoring the process every 10-15 minutes as it took place. Upon completion at ~10:15am EST, the phone was returned inside its SSSP Iridium kit and stowed back in the BO's operational data files (ODF) container. The satphone accompanies returning ISS crews on Soyuz reentry & landing for contingency communications with SAR (Search-and-Rescue) personnel after touchdown (e.g., after an "undershoot" ballistic reentry, as happened during the recent 15S return). The Russian-developed procedure for the monthly recharging has been approved jointly by safety officials. During the procedure, the phone is left in its fire-protective fluoroplastic bag with open flap. The Iridium 9505A satphone uses the Iridium constellation of low-Earth orbit satellites to relay the landed Soyuz capsule's GPS (Global Positioning System) coordinates to helicopter-borne recovery crews. The older Iridium-9505 phones were first put onboard Soyuz in August 2003. The newer 9505A phone, currently in use, delivers 30 hours of standby time and three hours of talk, up from 20 and two hours, respectively, on the older units.]*

Yuri also performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. Additionally, the FE-1 today checked up on the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem, gathering weekly data on total operating time & "On" durations for reporting to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

The crew had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Yuri at ~4:45am EST, Greg at ~10:50am, Mike at ~2:30pm.

The station residents conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Working off the Russian discretionary “if time permits” task list, Lonchakov performed a session of the DZZ-2 "Diatomeya" ocean observations program, using the NIKON-F5 DCS still camera and the HDV (high-definition) video camcorder from SM window 8 for ~20 min to record water areas with highly pronounced color contrast blooms, including coral riff lagoons, optically irregular cloud patterns along the flight path. *[Target zones today in the Atlantic & Indian Ocean were the geographic location over the underwater Mid-Atlantic Ridge and the area SW of Australia, in the Pacific Ocean the areas SW of Mexico to the coast of Chile, and S of Hawaii to the Chile coast.]*

Also off the work suggestions list, the FE-1 conducted another session for Russia's Environmental Safety Agency (EKON), making observations and taking KPT-3 aerial photography of environmental conditions on earth using the Nikon D2X with the SIGMA 300-800mm telephoto lens.

A new US “job jar” task list item for Mike & Greg called for checking for crystals in samples 8, 9, and 10 of the BCAT-4 (Binodal Colloidal Aggregation Test - 4: Polydispersion) experiment and photographing them if found, followed by homogenizing sample 3. *[BCAT-4-Poly uses the micro-G environment and a colloid-polymer mixture as a test bed to study how particles in a homogenous mixture become ordered to form crystals, without the masking effects of gravitational sedimentation. It is hoped that observations of samples will provide insight about how the particle interactions, polydispersity and sedimentation affect phase changes, as well as questions about the relative packing fractions, and which crystallization phase is manifested. The samples are being photographed using the EarthKAM camera; one sample (#3) is being photographed for a 6 day period. The remaining three samples will be photographed if crystals form.]*

Also off the voluntary task list, Fincke & Chamitoff were to conduct an audit of two CTBs (Cargo Transfer Bags) for hardware required for the upcoming setup operations of the JEM Robotics BDS (Backup Drive System).

No CEO photo targets uplinked for today.

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http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

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Solar Beta Angle -- 24.0 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 74 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57140

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
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11/16/08 -- STS-126/Endeavour/ULF-2 docking; ~4:56pm
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch (nom.)
11/27/08 -- STS-126/Endeavour/ULF-2 undocking; 10:32am
11/29/08 -- STS-126/Endeavour/ULF-2 landing; ~2:01 pm
11/30/08 -- Progress M-66/31P docking (nom.) – DC1 Nadir
12/18/08 -- Russian EVA-21
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
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Six-person crew on ISS
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/08/08
Date:	Saturday, November 08, 2008 2:17:02 PM
Attachments:	

ISS On-Orbit Status 11/08/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – light-duty day for CDR Fincke, FE-1 Lonchakov & FE-2 Chamitoff.*

After wakeup (1:00am EST), FE-2 Chamitoff again downloaded the accumulated data of the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment from his Actiwatch to the HRF-1 (Human Research Facility 1) laptop as part of his final week-long session with SLEEP. *[To monitor the crewmember's sleep/wake patterns and light exposure, Greg wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition and uses the payload software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list. This is Week 3 of 3 for the FE-2.]*

Yuri Lonchakov performed the periodic maintenance of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #2 of the regenerable dual-channel filtration system. The process will be terminated at ~4:00pm EDT. Bed #1 regeneration was performed yesterday (see note on False Fire Warning below). *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently (last time: 9/29 & 9/30).]*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the SM (Service Module) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises.*

Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]

As part of the house cleaning, Yuri Lonchakov conducted regular maintenance inspection & cleaning on fan screens in the FGB (TsV2) and DC-1 (V3).

In the FGB (*Funktsionalnyi-Grusovoi Blok*, Functional Cargo Block), Lonchakov and CDR Fincke closed out the extensive IFM (Inflight Maintenance) on the "Komparus" Command Measurement System (KIS), running final tests and cleaning up by stowing equipment & removed components in the FGB. *[Komparus maintains the FGB internal clock, stores time-tagged program commands for sequenced execution, activates & deactivates the dual-redundant radio telemetry system, measures FGB relative motion, and receives and routes USOS (US Orbital Segment) commands to be sent to the Node MDMs (Multiplexer/Demultiplexers).]*

Mike Fincke set up the NUTRITION with Repository hardware for his second session (FD30), starting tomorrow with blood draw and urine collections. The protocol requires Mike to begin the usual 8-hr fast tonight by 7:00pm EST, i.e., no food or drink, but water consumption is highly encouraged to ensure proper hydration. *[Mike's 24-hour urine collect starts with the first void of the day tomorrow morning and continues through the first void Monday morning. The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by supercold MELFI dewars), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

At ~9:05am the crewmembers conducted their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-Houston and TsUP-Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

For today's VolSci (Voluntary Weekend Science) program, FE-2 Chamitoff, with CDR Fincke assisting, had ~4 hrs on his timelines for another exciting range of tests of the SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellites) experiment which today used three satellites and five beacons. *[Today's run (Test Session 15), with ground team support, included the innovative use of "distributed computing" where the satellites perform low level path-following while high level path-determination happens in the crew's laptop, the*

ability of the crewmember to interactively tune his controller while testing in a micro-G environment, and the implementation in hardware of the crewmember's algorithm.]

Gregory completed the routine daily servicing of the SM's SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

The crew conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Working off the Russian discretionary "time permitting" task list, Lonchakov performed a session of the GFI-8 "Uragan" (hurricane) earth-imaging program, using the NIKON D2X digital camera to take 800mm-lens telephotos. *[Uplinked target zones were Darwin Island (one of the Galapagos Archipelago islands) and Patagonian Glaciers.]*

Also off the work suggestions list, the FE-1 conducted another session for Russia's Environmental Safety Agency (EKON), making observations and taking KPT-3 aerial photography of environmental conditions on earth using the Nikon D2X with the SIGMA 300-800mm telephoto lens.

A third task item from the Russian discretionary job list for Yuri was the regular service of the Russian BIO-5 Rasteniya-1 ("Plants-1") experiment, collecting initial data in the dry substrate for ~12 hrs, copying the data to a PCMCIA memory card for subsequent downlink via BSR-TM and OCA channels, plus filling the KDV water canister. *[Rasteniya-1 researches growth and development of plants under spaceflight conditions in the LADA-14 "greenhouse" from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). The payload hardware includes a module (MIS/ Module for the Investigation of Substrates), a MIS control unit (BU), a nitrogen purge unit (BPA) and other accessories. During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording.]*

SSRMS Walk-off: Yesterday, Robotics ground controllers released the SSRMS (Space Station Remote Manipulator System) from PDGF (Power & Data Grapple Fixture)-4 on the MBS (Mobile Base System) railcart and "walked" it the onto the

Node-2 PDGF. System performance was nominal. This completed the ULF-2 setup activities, and the double-grappled SSRMS is now in position for Flight ULF-2 docked operations, with its cameras stowed to protect them from thruster contamination during docking.

False Fire Event: Also yesterday, a (false) fire warning was enunciated in the SM associated with the on-going RS (Russian Segment) BITS2-12 Onboard Telemetry Measurement System testing of the BD1 (Database 1) mass memory unit. At test start, VD-SU (Data Output-Control System) mode was deactivated in an effort to prevent any erroneous messages from the BD1 when activated. At this time the BMP Micropurification Unit channel 1, being "baked out" for regeneration, had a temperature of 56 degC. Per software coding, when the temperature is more than 50 degC while VD-SU is off, a BMP-1 fire hazard warning is triggered. The crew was immediately informed of the false alarm via RGS (Russian Groundsite).

Weekly Science Update *(Expedition Eighteen -- Week 2)*

3-D SPACE: Planned.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Complete.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3/4 (Binary Colloidal Alloy Test 3/4): BCAT-4 operations were initiated on 11/1. Samples 8, 9, and 10 were homogenized for long-term crystal observations. Sample 3 was homogenized and the images are being analyzed on the ground at Harvard University. "So far, sample 3 image quality has been fantastic! In addition, Thank You for taking initiative to collect GNC vector data to help us understand the microgravity forces imposed on the BCAT module."

BIO-4: Complete.

CARDIOCOG-2: Complete.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): In progress. For the next CCISS session, Mike will be using a newly refurbished unit that will arrive on ULF-2.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-2/CGBA-5 (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus 5): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): Due to safety concerns identified for the PLEGPAY instrument when operated in Plasma Discharge mode, the entire EuTEF platform had to be put in survival mode on 9/1. Since then, the EuTEF power feeder#1 is de-activated and no science acquisition is possible. Request has been approved at IMMT for intermittent activation for 3 of the 9 EUTEF payloads. This only mitigated the science loss for the EXPOSE, DOSTEL and MEDET instruments. The situation implies significant loss of science return for all EUTEF payloads. On 10/30, the ground commanding activity to erase the software instructions of the so-called “Experiment 1” (Plasma Generation) from the memory of PLEGPAY was performed nominally. A full memory dump of PLEGPAY instrument was performed and the ground teams analyzed the outcome of the memory deletion. The EuTEF platform was permanently activated on 11/5.-- DEBIE-2: 24-hrs science script ran starting on 11/5;-- DOSTEL: On-going science acquisition;-- EuTEMP: Currently inactive as planned;-- EVC: Currently no picture taking;-- EXPOSE: On-going science acquisition;-- FIPEX: Science script started on 11/6;-- MEDET: On-going science acquisition; -- PLEGPAY: Inactive, “Experiment 1” memory has been erased on 10/30. Plasma generation capability has been disabled;-- TRIBOLAB: In thermal stabilization mode, Ball Bearing #4 experiment planned to be started on 11/6.

FSL (Fluid Science Laboratory): FSL is nominal.

GEOFLOW: The EC (Experiment Container) has been successfully installed back into the FSL (Fluid Science Laboratory) drawer. ESA is planning to resume the GEOFLOW science runs after ULF-2 mission and 30P undocking & 31P docking.

HDTV System Test DL (JAXA): Complete.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): In progress.

Marangoni Experiment for ISS in JAXA FPEF (Fluid Physics Experiment Facility): In progress.

Micro-G Clay (JAXA EPO): Complete.

MISSE (Materials ISS Experiment): Ongoing.

Moon Photography from ISS (JAXA EPO): Complete.

MOP (Motion Perception in Zero-G): Planned for STS-126.

MSG-SAME (Microgravity Science Glovebox): Complete.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MUSCLE-G (LBP/Low Back Pain): Complete.

NOA-1/-2 (Nitric Oxide Analyzer, ESA): Complete.

NUTRITION w/REPOSITORY: “Mike, thanks for the great catch on the RC spin settings during your FD15 session. The PI really appreciated your attentiveness and awesome communication! Your next session will be your FD30.”

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PCRF (Protein Crystallization Research Facility) Reconfiguration (JAXA): Complete.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): Complete.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): In progress

SOLAR (Solar Monitoring Observatory): The present Sun visibility window has started on 10/27, but due to high ISS yaw angle, SOLAR only started to track the Sun on 10/29 early morning. On 11/03, 3 Criss-Cross measurements have been successfully performed. On 11/04 a problem with the telemetry caused a sun tracking interruption. Some anomalies are currently being worked for SOLACES and SOVIM instruments. The current Sun observation window is planned to end on 11/09.-- SOVIM: no science acquisition, non-nominal mode: instrument power consumption was much lower than expected in nominal mode. For the time being it is powered off as the ground teams are working out a recovery plan, to be performed after the current Sun observation window.-- SOLSPEC: daily science acquisition - nominal;-- SOLACES: problem of synchronization of the instrument microcontrollers, some work-around procedures are being implemented since the start of the Sun observation window.

SOLO (Sodium Loading in Microgravity): Complete.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): Reserve.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): Complete.

CEO (Crew Earth Observations): Through 11/5 the ground has received a total of 2,074 frames of CEO images for review and cataloging. “Thanks for your excellent response to our target requests. Photos with times corresponding to our CEO

target request times are reviewed first and since our last report included: Cairo, Egypt (35 frames in a dual camera session – target confirmed – under review – sorry about the clouds); Wetumpka Impact Crater, Alabama (5 frames under review); Caracas, Venezuela, (29 frames under review); Central Arizona-Phoenix (32 frames – target confirmed – under review); Amazon River Delta (35 frames – target confirmed – more clouds than we had hoped); South Tibesti Megafans (52 frames – under review); Vredefort Impact Crater, South Africa (15 frames – target confirmed– soft focus – under review); South Georgia Island – 15 frames – target confirmed – and icebergs too); Patagonian Glaciers (17 frames – target not acquired); Arkenu (28 frames – target not acquired); Antarctic Ice Pack (20 frames – target confirmed – bergs and landmass too); Luquillo Forest (42 frames – target confirmed – under review). Glad to hear you are pumped, so are we! We are now holding off on our long-lens requests until we hear that the focus issues you described are resolved to your satisfaction. Your excellent imagery of the Arkenu impacts, from the first attempt, will be published on NASA/GSFC's Earth Observatory website this weekend. Great work!"

CEO photo targets uplinked for today were **Bosumtwi Impact Crater** *(this well-marked impact crater is located about 150 km west of the south end of Lake Volta in south central Ghana. It is a very young impact [just over a million years old], about 10.5 km in diameter, and almost completely filled by a lake. There are only a few images of this crater in the CEO database because the area is usually cloud and/or haze covered. On this partly cloudy, mid-morning pass, as ISS approached the coast from the NW, Mike & Greg were to find Lake Volta and look just right of track),* **Kerguelen Archipelago** *(this glaciated and volcanic archipelago is located in the far south Indian Ocean nearly 2,000 miles southeast of the island of Madagascar. Primary interest for monitoring is shots of the rarely photographed ice field and glaciers located on the western end of the main island. ISS approach was from the W in mid-afternoon illumination and at least partial clearing was expected. Trying for a nadir mapping pass with the 180mm lens),* **Heard Island, Australia** *(Heard Island is a bleak, uninhabited, and mountainous island located in the Southern Ocean; about two-thirds of the way from Madagascar to Antarctica. Its mountains are covered in glaciers and dominated by Mawson Peak, a 9,006 ft high complex volcano which forms part of the Big Ben massif. A long thin spit named "Elephant Spit" extends from the east of the island. ISS pass was in mid-afternoon light with weather satellite imagery suggesting partial clearing from the W. Looking well right of track and trying for oblique context views of this challenging target),* and **S. Georgia/S. Sandwich** *(the South Georgia Island is an arching, mountainous, and glaciated island that lies about 860 miles ESE of the Falkland Islands. The South Sandwich Islands form a separate island group and are to the SE. Only partial clearing was expected at the time of the ISS pass, but the crew was to try for a mapping pass of the north coast of South Georgia. The pass was in early afternoon, looking well right of track and looking also for large icebergs reported in*

the vicinity).

CEO photography can be studied at this “Gateway” website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

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Solar Beta Angle -- 21.0 deg (magnitude increasing)
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Mean altitude loss in the last 48 hours -- 48 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57122

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11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch (nom.)
11/27/08 -- STS-126/Endeavour/ULF-2 undocking; 10:32am
11/29/08 -- STS-126/Endeavour/ULF-2 landing; ~2:01 pm
11/30/08 -- Progress M-66/31P docking (nom.) – DC1 Nadir
12/18/08 -- Russian EVA-21
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
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05/25/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS

07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/07/08
Date:	Friday, November 07, 2008 2:42:34 PM
Attachments:	

ISS On-Orbit Status 11/07/08

All ISS systems continue to function nominally, except those noted previously or below.

After wakeup, FE-2 Chamitoff again downloaded the accumulated data of the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment from his Actiwatches to the HRF-1 (Human Research Facility 1) laptop as part of his final week-long session with SLEEP. *[To monitor the crewmember's sleep/wake patterns and light exposure, Greg wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition and uses the payload software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list. This is Week 3 of 3 for the FE-2.]*

FE-1 Lonchakov performed the periodic maintenance of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The process will be terminated at ~4:15pm EST and Bed #2 regeneration performed tomorrow. (Last time done: 10/18-19). *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently (last time: 9/29 & 9/30).]*

In the FGB (*Funktsionalnyi-Grusovoi Blok*, Functional Cargo Block), Lonchakov and CDR Fincke again spent several hours on the extensive IFM (Inflight Maintenance) on the "Komparus" Command Measurement System (KIS), removing and replacing boxes with electronic components & their cabling of the KIS system which acts as the communications portal of the Khrunichev-built FGB, receiving & forwarding ground commands addressed to onboard systems when the FGB is in view of a ground station, and serving other central functions. *[Today, Yuri & Mike retrieved*

new spare parts from behind stowage panels in the FGB, then removed & replaced three electronics containers (KR-MPA Radio Engineering box, KS1-MPA Main Control box #1, KD-MPA Integrator box), following up with closeout ops. Returning and stowing cargo items and tools are scheduled tomorrow. Background: Komparus maintains the FGB internal clock, stores time-tagged program commands for sequenced execution, activates & deactivates the dual-redundant radio telemetry system, measures FGB relative motion, and receives and routes USOS (US Orbital Segment) commands to be sent to the Node MDMs (Multiplexer/ Demultiplexers).]

As has become standard operating procedure after deactivation/reactivation of the BITS2-12 onboard measurement telemetry system and VD-SU monitoring mode, Yuri performed a quick function verification of the relatively new SUBA Ethernet connection between the OpsLAN (Operations Local Area Network) and the BRI Smart Switch Router in the SM. *[The routine task uses the RSS1 laptop for a comm check with the RSC-E PingMaster application and for downloading BRI log files.]*

Afterwards, the FE-1 switched the Vozdukh CO_2 removal system from automatic mode to manual control.

Continuing the current round of the monthly preventive maintenance of RS (Russian segment) ventilation systems, FE-2 Chamitoff performed a 1h15m inspection and cleaning of Group A ventilator fans and grilles in the SM (Service Module).

Gregory also filled out the regular FFQ (Food Frequency Questionnaire), his 19th, on the MEC (Medical Equipment Computer). Mike Fincke's second FFQ session remains on the discretionary "job jar" task list. *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

In the COL (Columbus Orbital Laboratory), the FE-2 disconnected and removed the AmiA (Antimicrobial Applicator) module from the TCS (Thermal Control System) loop, an exacting 1-hr job, which he had installed yesterday. *[Running since yesterday, AmiA has introduced OPA (Ortho-phthalaldehyde), an antimicrobial agent, into the COL TCS coolant at the 1F3 Z-Panel. Prior to installation, Greg had*

purged the applicator to vacuum and conducted a leak check. AmiA was stowed for return, and a small amount of fluid was be drained from the module with a TCS Coolant Sampling Adapter into an ITCS Sample Port Flush Bag.]

Fincke & Chamitoff again worked in the US Airlock (A/L), clearing it of non-EVA related items, continued EVA tool configuration procedures and started EMU (Extravehicular Mobility Unit) battery maintenance charging on battery #2073 in BC (Battery Charger) 4. *[Discharge/recharge of the 16V-batteries takes about 12-15 hours. The full maintenance discharge, done manually in the early days of ISS ops, is handled automatically by an SSC (Station Support Computer) laptop equipped with a special DOS application which will terminate the process on 11/10.]*

Afterwards, Mike took a video camera into the A/L for filming a “tour” of its interior to be used for an early preparation of the STS-126 crew for their ULF-2 spacewalks, emphasizing EVA Tool & EMU Configurations, generic layout of METOX (Metal Oxide) canisters & batteries in the MO2 Bag, the mesh bag labeled "ULF2 EMU B/U (Pp)", and other view deemed important by the CDR.

The FE-2 performed the regular bi-weekly reboot of the SSC OCA Comm Router laptop.

The crew conducted their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Fincke completed the routine daily servicing of the SM’s SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

As an addition to his voluntary task list for today, Yuri Lonchakov got the regular daily job of IMS (Inventory Management System) “delta file” updating/editing for the weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Greg had another 60-min reserved for hardware prepacking for STS-126/ULF-2, using as reference a revised uplinked Prepack List which reflects crew calldowns from the 11/3 ground specialist tagup.

At ~2:10am EST, CDR Fincke powered up the SM's amateur radio equipment

(Kenwood VHF transceiver with manual frequency selection, headset, & power supply) and conducted, at 2:15am, a ham radio exchange with the Dibrugarh University, Dibrugarh, India. *[Dibrugarh University, the easternmost University of India, was set up in 1965 under the provisions of the Dibrugarh University Act, 1965 enacted by the Assam Legislative Assembly. It is a teaching-cum-affiliating University with limited residential facilities. The University is situated at Rajabheta at a distance of about five kilometers to the south of the premier town of the Dibrugarh in the eastern part of Assam as well as India. Dibrugarh, a commercially and industrially advanced town in the entire north-eastern region, also enjoys a unique place in the fields of Art, Literature and Culture. The district of Dibrugarh is well known for its vast treasure of minerals (including oil and natural gas and coal), a flora and fauna and largest concentration of tea plantations. The diverse tribes with their distinct dialects, customs, traditions and culture form a polychromatic ethnic mosaic which makes this area a veritable paradise for the study of Anthropology and Sociology, beside Art and Culture. Questions to Mike were uplinked beforehand. "How do you feel in zero gravity?"; "Which part of the Earth and space do you find most beautiful?"; "Have you seen the mighty Brahmaputra?"; "How do you manage yourself out there? Are there any facilities for your entertainment?"; "How long do you sleep?"; "What is the mission behind your space tour?"; "How does it feel while escaping the gravity?"; "Have you found anything which could be beneficial to the world as a whole?"; "What kind of changes do you expect on your return to Earth?"; "How was your experience while voting for the presidential election?"]*

At ~4:15am, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~2:45pm, the ISS crew will have their regular weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC (Station Support Computer)]*.

New voluntary tasks added to the US "job jar" job list for Fincke are (a) documentary photography of panel and strap installations in the Kibo JPM (JEM Pressurized Module), (b) replacement of rack pivot fittings in JLP (JEM Logistics Pressurized Segment) and JPM, and (c) preparation of retention nets in Kibo for stowing ULF-2 delivered cargo items.

WRM Update: An updated WRM (Water Recovery Management) "cue card" was uplinked overnight for the crew's reference, updated with yesterday's water audit. *[The new card (18-0006B) lists 23 CWCs (~792.5 L total) for the four types of water identified on board: technical water (151.3 L, for Elektron electrolysis), potable water (573.6 L, incl. 174.6 L currently off-limit because of* Wautersia

bacteria), condensate water (28.4 L), waste/EMU dump and other (39.2 L). Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

VolSci Look-ahead: For this weekend's VolSci (Voluntary Science) program, Mike & Greg were asked to consider additional BCAT (Binary Colloidal Alloy Test)-4 operations, including crystal checks on some samples (8, 9, 10), taking photos of any crystals found, and then homogenizing and photographing sample 1 which would have photos taken automatically once an hour for three days using the EarthKAM system.

CEO photo targets uplinked for today were **Kerguelen Archipelago** *(this glaciated and volcanic archipelago is located in the far south Indian Ocean nearly 2,000 miles southeast of the island of Madagascar. Primary interest for monitoring is shots of the rarely photographed ice field and glaciers located on the western end of the main island. ISS approach was from the W in mid-afternoon illumination and at least partial clearing was expected. Using the long lens settings for a detailed, mapping pass looking just left of track),* **Beni River dynamics, Bolivia** *(the Beni River breaks out of the Andes Mountains about 100 miles north-northeast of the capital city of La Paz to become the major drainage feature of northern Bolivia. It is a very dynamic meandering stream with numerous oxbow lakes and meander scars visible in its floodplain. The Beni's seasonal changes in course, along with the rapid evolution of its channels and meanders, makes it an ideal candidate for studying, understanding, and illustrating these erosional processes. On this mid-morning pass with just a few clouds expected, the crew had nadir views of a key segment of the river. Their approach was from the NW and the Beni flows generally northward. Using the long lens settings for a detailed mapping strip),* and **Patagonian Glaciers** *(best pass of the day for lighting of this target area was at nadir over the southernmost portion of the Southern Patagonian Ice Field. The crew should have had mid-afternoon light with an expected partial clearing. CEO already has numerous, excellent views of most of the beautiful, large glacier on the eastern flank of the Andes. This time Mike & Greg were to try for detailed views of the smaller, less-well photographed ones on the western flank).*

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Six-person crew on ISS
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/06/08
Date:	Thursday, November 06, 2008 3:09:36 PM
Attachments:	

ISS On-Orbit Status 11/06/08

All ISS systems continue to function nominally, except those noted previously or below. *Uplink to crew from MCC-H Flight Control: "Excellent job on the SSRMS Ops and Komparus repair. You guys make it look easy!" (Which it isn't).*

After wakeup, FE-2 Chamitoff again downloaded the accumulated data of the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment from his Actiwatches to the HRF-1 (Human Research Facility 1) laptop as part of his final week-long session with SLEEP. *[To monitor the crewmember's sleep/wake patterns and light exposure, Greg wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition and uses the payload software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list. This is Week 3 of 3 for the FE-2.]*

In the FGB (Functional Cargo Block), FE-1 Lonchakov, in part assisted by CDR Fincke, continued the extensive IFM (Inflight Maintenance) work on the "Komparus" Command Measurement System (KIS), removing and replacing boxes with electronic components & their cabling of the system which acts as the communications portal of the Khrunichev-built FGB, receiving & forwarding ground commands addressed to onboard systems when the FGB is in view of a ground station, and serving other central functions. *[Komparus maintains the FGB internal clock, stores time-tagged program commands for sequenced execution, activates & deactivates the dual-redundant radio telemetry system, measures FGB relative motion, and receives and routes USOS (US Orbital Segment) commands to be sent to the Node MDMs (Multiplexer/Demultiplexers).]*

In the COL (Columbus Orbital Laboratory), FE-2 Chamitoff successfully installed an AmiA (Antimicrobial Applicator) module in the TCS (Thermal Control System) loop, an exacting 2-hr job. *[Running for a minimum of six hours, AmiA is introducing*

OPA (Ortho-phthalaldehyde), an antimicrobial agent, into the COL TCS coolant at the 1F3 Z-Panel. Prior to installation, Greg purged the applicator to vacuum and conducted a leak check. Later, AmiA will be removed and stowed for return, and a small amount of fluid will; be drained from AmiA with a TCS Coolant Sampling Adapter.]

CDR Fincke meanwhile verified the stowage location of an empty OGS PWR (Oxygen Generation System/Payload Water Reservoir, #2003) to be used for ULF-2 activities. *[The PWR was disconnected and stowed away several weeks ago.]*

Afterwards, Fincke completed the weekly 10-min. CWC (Contingency Water Container) inventory as part of on-going WRM (Water Recovery & Management) assessment of onboard water supplies. Updated "cue cards" based on the crew's water calldowns are sent up every other week. *[The new card (18-0006A), to be updated with today's data, lists 25 CWCs (~794.5 L total) for the four types of water identified on board: technical water (153.3 L, for Elektron electrolysis), potable water (573.6 L, incl. 174.6 L currently off-limit because of* Wautersia *bacteria), condensate water (28.4 L), waste/EMU dump and other (39.2 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

Mike also spent some time on locating and verifying availability of rack pivot pins required during the ULF-2 docked period for MPLM (Multi-Purpose Logistics Module) transfer operations.

In the SM (Service Module), FE-1 Lonchakov serviced the new Russian BIO-5 Rasteniya-1 ("Plants-1") experiment by upgrading its MIS-LADA control unit (BU), i. e., uninstalling its old software and loading it with a new program version. *[Rasteniya-1 researches growth and development of plants under spaceflight conditions in the LADA-14 "greenhouse" from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). The payload hardware includes a module (MIS/Module for the Investigation of Substrates), the MIS control unit (BU), a nitrogen purge unit (BPA) and other accessories. During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording.]*

In preparation for another RPM (R-bar Pitch Maneuver) training session, Mike Fincke gathered and powered down the four D2Xs digital cameras, as required for the regular "blank image" checkout which he performed some time later (after a minimum of 30 mins.) by taking blank images, storing them on a PCMCIA (Portable Computer Memory Card International Adapter) flash memory card and later downlinking them to MCC-Houston for analysis. *[Blank images are used to identify*

“dead” pixels for each camera.]

Afterwards, Mike & Greg performed their third standard 30-min Shuttle RPM skill training, using the D2X digital still cameras with 400 & 800mm lenses to take in-cabin target imagery using a Shuttle cutout. Afterwards, the obtained OBT (onboard training) images were downlinked to the ground for analysis (~12:25pm EST). *[The RPM drill prepares crewmembers for the bottom-side mapping of the Orbiter at the arrival of the Shuttle (STS-124/1J) on 6/2. During the RPM at ~600 ft from the station, the “shooters” have only ~90 seconds for taking high-resolution digital photographs of all tile areas and door seals on Discovery, to be downlinked for launch debris assessment. Thus, time available for the shooting will be very limited, requiring great coordination between the two headset-equipped photographers and the Shuttle pilot.]*

Working in the US Airlock, Chamitoff & Fincke configured EVA tools, set up the CL (Crewlock) and readied the large ORU (Orbit Replaceable Unit) bag and staging bags in preparation for the three ULF-2 mission EVAs. *[Overheard from Mike while reviewing EVA tools: “This looks like something you might fight a vampire with,” referring to a loop pin puller.]*

The FE-2 completed the once-a-month reboot of all active US PCS (Portable Computer System) laptops, along with recording their batteries’ state of charge for the ground.

Gregory had another 50-min reserved for hardware prepacking for STS-126/ULF-2, using as reference a revised uplinked Prepack List which reflects crew calldowns from the 11/3 ground specialist tagup.

The crew performed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Chamitoff completed the routine daily servicing of the SM’s SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

As an addition to his voluntary “job jar” task list for today, Greg also was assigned the regular daily job of IMS (Inventory Management System) “delta file” updating/ editing for the regular weekly automated export/import to its three databases on the

ground (Houston, Moscow, Baikonur).

A second discretionary task list item was for Mike Fincke to fill out his second FFQ (Food Frequency Questionnaire) on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

MT Translation: In preparation for ULF-2, the MT (Mobile Transporter), carrying the MCAS (Mobile Base System [MBS] Capture Attach System) with the ESP-3 (External Stowage Platform 3), was successfully trundled on the truss from WS (Work Site) 7 to WS 5 via ground commanding. For the translation, the RS thrusters were disabled from 8:40am – 11:50am due to loads constraints. Later, new mass properties, accounting for the MT dislocation, were uplinked.

TsVM Restart with Context: As a follow-on after the recent BITS2-12 Onboard Telemetry Measurement System repair & checkout, TsUP-Moscow has begun restarting the Russian TsVM Central Computer in the SM with context (i.e., with a new uplinked RSS communication program). The complex recovery of the BVS onboard computer system's control involves a large number of subsystems that need to be activated, reset, inhibited or updated. The Elektron oxygen generator remains off until later tonight, but represses with O_2 from Progress 30P tankage are being conducted as required.

CEO photo targets uplinked for today were **South Tibesti Megafans** *(ISS had a clear, mid-morning pass over this target located in northwestern Chad south of the Tibesti Mountains. Relict channels of an extensive megafan river system occupy a large area, probably dating from the last wet period in the Sahara Desert [~10, 000 years ago]. These channel networks appear to be good analogs for river-like lines on Mars. Overlapping images just left of track were requested. The relict stream beds are located on the light-toned flats below the dark volcanic slopes of the Tibesti Mountains),* **Vredefort Impact Crater** *(this large, ancient impact located in northern South Africa is about 300km in diameter and over 2 billion years old. On this fair-weather pass, in late-morning light, ISS approached the impact from the NW, and Mike & Greg were asked to shoot near nadir, using the long lens settings for mapping the arching ridge features marking the rim of the impact),* **Kerguelen** *(this glaciated and volcanic archipelago is*

located in the far south Indian Ocean nearly 2,000 miles southeast of the island of Madagascar. Of primary interest is photography for monitoring of the rarely photographed ice field and glaciers located on the western end of the main island. The station's approach was from the W in mid-afternoon illumination and at least partial clearing was expected. Using the long lens settings for a detailed, near-nadir mapping pass), **S. Georgia/S. Sandwich** *(the South Georgia Island is an arching, mountainous and glaciated island that lies about 860 miles east-southeast of the Falkland Islands. The South Sandwich Islands form a separate island group and are to the SE. Only partial clearing was expected at the time of the overpass, but Mike & Greg were to try for detailed views of the glaciers on the north coast of South Georgia),* and **Coral reefs, American Samoa** *(although much of this target area is to the right of track, the crew appeared to have an excellent late morning pass with only a few clouds. It should have provided nadir views of the islands of Western Samoa and Apia. Using the long lens settings and try to map in detail the beautiful fringing reef structures of these South Pacific islands)*.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 8:30am EST [= epoch]):
Mean altitude -- 352.0 km
Apogee height -- 354.3 km
Perigee height -- 349.7 km
Period -- 91.58 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.000344
Solar Beta Angle -- 14.0 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 48 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57093

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
11/14/08 -- STS-126/Endeavour/ULF-2 launch – MPLM Leonardo, LMC, PSSC; 7:55pm EST
11/14/08 -- Progress M-65/30P undocking
11/16/08 -- STS-126/Endeavour/ULF-2 docking; ~4:56pm
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch (nom.)
11/27/08 -- STS-126/Endeavour/ULF-2 undocking; 10:32am
11/29/08 -- STS-126/Endeavour/ULF-2 landing; ~2:01 pm

11/30/08 -- Progress M-66/31P docking (nom.)
12/18/08 -- Russian EVA-21
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch

Six-person crew on ISS

07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/05/08
Date:	Wednesday, November 05, 2008 2:26:15 PM
Attachments:	

ISS On-Orbit Status 11/05/08

All ISS systems continue to function nominally, except those noted previously or below.

After wakeup, FE-2 Chamitoff again downloaded the accumulated data of the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment from his Actiwatches to the HRF-1 (Human Research Facility 1) laptop as part of his final week-long session with SLEEP. *[To monitor the crewmember's sleep/wake patterns and light exposure, Greg wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition and uses the payload software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list. This is Week 3 of 3 for the FE-2.]*

In the FGB (Functional Cargo Block), FE-1 Lonchakov continued the extensive IFM (Inflight Maintenance) work on the "Komparus" Command Measurement System (KIS), removing and replacing electronic components of the system which acts as the communications portal of the Khrunichev-built FGB, receiving & forwarding ground commands addressed to onboard systems when the FGB is in view of a ground station, and serving other central functions. *[Komparus maintains the FGB internal clock, stores time-tagged program commands for sequenced execution, activates & deactivates the dual-redundant radio telemetry system, measures FGB relative motion, and receives and routes USOS (US Orbital Segment) commands to be sent to the Node MDMs (Multiplexer/ Demultiplexers).]*

FE-2 Chamitoff prepared for camera viewing of today's ESP-3 (External Stowage Platform 3) relocation with the SSRMS (Space Station Remote Manipulator System) by working in the Kibo JEM (Japanese Experiment Module) to set up and activate the JEMRMS PTU (Robotic Manipulator System/Pan & Tilt Unit) of the Elbow camera, reset the JEU (Joint Expedited Undocking) resolvers and power on the

EXT2 video camera.

After booting up the CUP RWS (Cupola Robotic Workstation) A31p laptop in the US Lab and starting the DOUG (Dynamic Onboard Ubiquitous Graphics) application to support the Robotics activities, the FE-2 & CDR used the SSRMS to relocate the ESP-3 from its permanent location on the zenith side of the P3 truss element to the MCAS (Mobile Base System [MBS] Common Attachment System) at WS5 (Worksite 5) on the truss for ULF2. *[On EVA-1 during the Shuttle-docked operations, the spacewalkers will transfer the NTA (Nitrogen Tank Assembly) on the ESP-3 to the Endeavour for return and stow the FHRC (Flex Hose Rotary Coupler), arriving on STS-126, on the ESP-3. Today's relocation consisted of grappling ESP-3 with the SSRMS, demating the UMA (Umbilical Mechanism Assembly), deploying the CLA (Capture Latch Assembly) with the CAS (Common Attach System) in Normal State, and mating the ESP-3. Afterwards, the CUP laptop was powered down, as were the JEMRMS systems, with the Elbow camera reconfigured in stowed position.]*

Yuri Lonchakov conducted monthly maintenance on the deactivated Russian IK0501 GA (Gas Analyzer) of the SOGS Pressure Control & Atmospheric Monitoring System by replacing its CO_2 filter assembly (BF) with a new unit from FGB stowage (done last: 9/25), then reactivating the unit. The old filter was discarded.

Using a vacuum cleaner with soft brush attachment, the FE-1 performed the periodic cleaning of the side panel fan grilles of the Russian LIV Video Complex voltage converter (UN941) behind SM (Service Module) panel 426.

With the RS (Russian Segment) Elektron-VM oxygen (O_2) generator powered down, Yuri purged its BZh Liquid Unit with nitrogen (N_2) at 0.65 kg/cm^2 via its KE3 & VN3 valves, a periodic safety measure.

Chamitoff completed the routine daily servicing of the SM's SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

Greg also conducted the periodic checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the passageways SM PrK (Service Module Transfer Compartment)–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, and FGB GA–

Node-1.

The regular daily IMS (Inventory Management System) maintenance task was added today to Yuri's discretionary "time permitting" job list, i.e., updating/editing the IMS standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The FE-2 had another hour reserved for hardware prepacking for STS-126/ULF2, using as reference a revised uplinked Prepack List which reflects crew calldowns from the 11/3 ground specialist tagup.

The crew performed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

At ~3:30pm EST, FE-2 Chamitoff's schedule calls for a teleconference via Ku-band with his replacement, Astronaut Sandy Magnus, due to arrive on ULF2 to be the new FE-2 for Expedition 18. *[Purpose of the 30-min tagup: to pass on Lessons Learned to the upcoming Increment crew, i.e., to begin the handover process prior to the arrival on orbit through Videocons and Data Exchanges between the current crew and the upcoming crew. These tagups normally start toward the end of the first month on orbit.]*

Acoustic Survey Issue: Yesterday's periodic acoustic measurement protocol was not completed nominally due to an issue with data recovery. Steps at resolving the recovery snag are underway, and CDR Fincke was asked to redo the measurement for one of the three static dosimeters, first setting it up early this morning, then recording its data and stowing it tonight, at least 12 hrs after the setup.

CEO photo targets uplinked for today were **Arkenu 1 and Arkenu 2 Impact Craters** *(Arkenu 1 & 2 are a rarely exposed double impact structure created by a 500 m diameter pair of asteroids. Located in the desert of southeastern Libya, Arkenu 1 is 6.8 km in diameter and Arkenu 2 is 10 km. Both have been dated as less than 140 million years old. ISS approach was from the NW under clear skies at mid-morning. First, looking ahead near nadir, Mike & Greg were to try to spot the large dark features of Arkenu and Auenat, and then look for the tiny, faint impacts just right of track. They recently acquired CEO's best-ever images with the 400mm lens settings on 10/21. This time, they were to try for them using the 800mm),* **Antarctic Ice Pack** *(as part of the ISS program's participation in the International Polar Year [IPY], CEO is attempting to monitor conditions of Antarctic Ice Pack, usually situated well right of track near the southernmost portion of the ISS orbit*

track. Weather satellite imagery loops today suggested the possibility of at least partial clearing in this area of the Southern Ocean. Mike & Greg had mid-afternoon light, to look for pack ice features well right of track towards the Antarctic coast), and **Luquillo Forest, Puerto Rico** *(fair, mid-morning, just right of track, this Long Term Ecological Research Site [LTER] is located near the northeastern corner of the island of Puerto Rico. ISS pass was in mid-morning; hopefully with a minimum of cloud formations. As the station approached the Virgin Islands from the NW, Mike & Greg were to look for this forest site just right of track using the long lens settings for detail).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

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Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 53 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57077

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
11/14/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC; 7:55pm EST
11/16/08 -- STS-126/Endeavour/ULF2 docking; ~4:56pm
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/27/08 -- STS-126/Endeavour/ULF2 undocking; 10:32am
11/29/08 -- STS-126/Endeavour/ULF2 landing; ~2:01 pm
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
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02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch

03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch

Six-person crew on ISS

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/04/08
Date:	Tuesday, November 04, 2008 2:20:33 PM
Attachments:	

ISS On-Orbit Status 11/04/08

All ISS systems continue to function nominally, except those noted previously or below.

Upon wakeup, CDR Fincke started the next part (3rd of 5) of the periodic acoustic measurement protocol by recording post-sleep data of the crew-worn acoustic dosimeters, later deploying the dosimeters statically (Part 4), one at the SM (Service Module) Central Post, one in Node-2 and the third in an empty rack bay in the COL (Columbus Orbital Laboratory) which is being considered as a future temporary sleep station. Later, at ~2:00pm EST, Fincke recorded the data taken by the three static dosimeters during the day (Part 5), and then stowed the dosimeters. *[Acoustic data must be taken twice per Increment, each time for the duration of the 16-hour crew workday.]*

Before morning inspection and breakfast, FE-1 Lonchakov terminated his second experiment session for the long-term Russian sleep study MBI-12/ SONOKARD, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

FE-2 Chamitoff started his day by downloading the accumulated data of the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment from his Actiwatches to the HRF-1 (Human Research Facility 1) laptop as part of his final week-long session with SLEEP. *[To monitor the crewmember's sleep/wake patterns and light exposure, Greg wears a special Actiwatch device which*

measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition and uses the payload software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list. This is Week 3 of 3 for the FE-2.]

In the SM, Lonchakov serviced the new Russian BIO-5 Rasteniya-1 ("Plants-1") experiment, copying initial data to a PCMCIA memory card for subsequent downlink via BSR-TM and OCA channels, plus filling the KDV water canister. *[Rasteniya-1 researches growth and development of plants under spaceflight conditions in the LADA-14 "greenhouse" from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). The payload hardware includes a module (MIS/Module for the Investigation of Substrates), a MIS control unit (BU), a nitrogen purge unit (BPA) and other accessories. During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording.]*

Chamitoff continued the new (monthly) round of periodic preventive maintenance of ventilation systems in the RS (Russian Segment), working in the FGB cleaning the ventilation screens of panels 201, 301 & 401.

Also in the FGB, the FE-1 made preparations for the subsequent R&R (removal and replacement) of Komparus components scheduled for the next few days (11/4-11/8), today first tagging up with ground specialists via S-band to discuss the activities, then setting up the work area and switching protective caps on a power outlet (148A). *["Komparus" is the FGB's communications portal. The Komparus (KIS) onboard radio command & measuring system activates and deactivates the FGB's radio telemetry system, with transmitters, commutators, external antennas, etc. of its two independently operating RTU-A and –B data telemetry subsystems.]*

In support of JAXA/Tsukuba operations in the Kibo module (uplinking new databases & downlinking log files after database test runs), Gregory connected a JEMRMS (JEM Robotic Manipulator System) power cable to a UOP (Utility Outlet Panel), then powered up and checked the JEMRMS BUC (Backup Controller). After the ground commanding was done, the FE-2 turned off the BUC and disconnected the power cable.

In preparation for tomorrow's scheduled ESP-3 (External Stowage Platform 3) relocation from the zenith side of the P3 truss element to the MCAS (Mobile Base System [MBS] Common Attachment System), Mike Fincke and Greg Chamitoff conducted the usual one-hour review of DOUG (Dynamic Onboard Ubiquitous

Graphics) software. *[The EBCS (External Berthing Camera System), which will be required for the ESP-3 relocation, was properly checked out by the ground on 9/8, with support by Volkov & Chamitoff.]*

In the Kibo JLP (JEM Logistics Pressurized Module), Greg replaced a damaged PBA (Portable Breathing Assembly) mask (with a broken comm piece) with a new PHA QDMA (Prebreathe Hose Assembly/Quick-Don Mask Assembly) from the spares kit. *[A new QDM will be transferred on ULF2 FD4 from the Endeavour to the PHA spares kit prior to the EVA Prebreathe.]*

Mike Fincke had ~1:45h set aside to work on the RED (Resistive Exercise Device), adjusting its spiral pulleys in order to increase canister loading and installing two external splines, including one found. Afterwards, the CDR performed the usual load re-calibration of the canisters. *[The calibration allows accurate execution of exercise protocol objectives. Upon receipt of the results of the calibration data, ground specialists review the data and, assuming favorable engineering analysis, give the crew a GO for their RED exercise session. Calibration of the load settings of the pulley cans is performed with an on-orbit calibration kit with a special calibration tool and steel handles. Downlink from Mike after the successful calibration: "Cheers!"]*

Mike & Greg had another 3:20h reserved for hardware prepacking for the STS-126/ ULF2, using as reference a revised uplinked Prepack List which reflects crew calldowns from yesterday's tagup.

The CDR also conducted the routine daily servicing of the SOZh (ECLSS) system in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers, replacement of EDV-SV waste water and EDV-U urine containers and performing US condensate processing (transfer from CWC to EDV containers) if condensate is available.]*

Later, the FE-2 performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew had their periodic PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Greg at ~10:10am, Mike at ~10:50am, and Yuri at ~ 11:40am EST.

FE-1 Lonchakov again had an hour to himself for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for

the first two weeks after starting station residence, if she/he chooses to take it.

The crew performed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

At 10:30am EST, Gregory supported the periodic VHF-1 emergency communications check over NASA's VHF (Very High Frequency) stations, today with the Dryden (10:33am) and White Sands (10:36am) VHF sites, talking with Houston/Capcom, MSFC/PAYCOM (Payload Operation & Integration Center Communicator), Moscow/GLAVNI (TsUP Capcom), EUROCOM/Munich and JCOM/ Tsukuba in the normal fashion via VHF radio from a handheld microphone and any of the USOS ATUs (Audio Terminal Units). *[Purpose of the test is to verify signal reception and link integrity, improve crew proficiency, and ensure minimum required link margin during emergency (no TDRS) and special events (such as a Soyuz relocation).]*

At ~5:10am, CDR Fincke powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, & power supply) and conducted, at 5:15am, a ham radio exchange with St. Thomas' Primary School, Brisbane, Queensland, Australia. Several displays were planned for the school library on the school's ARISS (Amateur Radio in ISS) project, with information on the NASA space program, Amateur Radio and ARISS. They also have a link to the school ARISS Project web site, NASA and the current location of the ISS, plus an interactive section where children can listen to past ARISS school contacts. Questions were uplinked to Mike beforehand. *["How did the space station get into space and how does it stay there?"; "What is it like eating and sleeping in space?"; "Do you have night and day in the space station?"; "Where does the space station get its power from?"; "Besides humans, are there any living things on the space station?"; "Is there any danger of being hit by a meteoroid when on a space walk and what protection do you have?"; "What do you do if some one gets sick or injured in space?"; "With astronauts on the space station from so many countries, what time zone does it work in?"; "Do you get to speak to your family from the space station?"; "How long is it safe to live in the space station before it starts to affect your health?"; "How do you have enough oxygen to breath on the space station?"; "What do you miss the most about earth?"]*

At ~1:05pm, the crew downlinked two TV addresses with Russian/English greetings, one on the 90th Anniversary of the N. E. Zhukovski Central Aerohydrodynamic Institute (TsAGI) in the city of Zhukovski, the other to the personnel of the Russian Ministry of Internal Affairs and participants of the Day of Militia ceremony on 11/10. *[TsAGI, founded on December 1, 1918, by Professor*

Nikolai Egorovich Zhukovski, a pioneer of national aviation, today maintains ties with over 50 leading aerospace companies and research centers in the US, Europe and Asia in the areas of theoretical and experimental aviation research. Zhukovski, the "Father of Russian Aviation" is known for the saying "Rather than using the strength of their muscles, humans will fly using the power of their minds".]

At ~3:00pm, the E18 crew is scheduled for a teleconference with the crew of the STS-126 mission, via S/G-2 for audio and Ku-Band for video.

CEO photo targets uplinked for today were **South Tibesti Megafans** *(ISS had a clear, mid-morning pass over this target located in northwestern Chad south of the Tibesti Mountains. Relict channels of an extensive megafan river system occupy a large area, probably dating from the last wet period in the Sahara Desert [~10,000 years ago]. These channel networks appear to be good analogs for river-like lines on Mars. Overlapping images at nadir along the ground track were requested. The relict stream beds are located on the light-toned flats south of dark volcanic slopes of the Tibesti Mountains),* **Vredefort Impact Crater** *(this large, ancient impact located in northern South Africa is about 300km in diameter and over 2 billion years old. On this fair-weather pass near midday, Mike & Greg approached the impact from the NW. Looking just right of track and using the long lens settings for a mapping of the visible rim features of the impact),* **Georgia/S. Sandwich** *(the South Georgia Island is an arching, mountainous and glaciated island that lies about 860 miles east-southeast of the Falkland Islands. The South Sandwich Islands form a separate island group to the SE. Weather was marginal [partly cloudy at best], but Mike & Greg were to try for detailed views of the glaciers on the north coast of South Georgia. The pass was in the best light near midday),* and **Patagonian Glaciers** *(the Northern Patagonian Ice Field is the northernmost of two large remaining ice fields of South America, located in the Andes Mountains of southern Chile. It is also the world's largest ice field so far from the poles. Looking just left of track on this partly cloudy pass near midday. Mike & Greg were to try for detailed views of the glacier features, particularly on the western and northern margins)*.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 7:35am EST [= epoch]):
Mean altitude -- 352.1 km
Apogee height -- 354.3 km
Perigee height -- 349.9 km
Period -- 91.58 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0003272

Solar Beta Angle -- 6.1 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 56 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57061

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
11/05/08 -- ESP-3 relocation
11/14/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC; 7:55pm EST
11/16/08 -- STS-126/Endeavour/ULF2 docking; ~4:56pm
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/27/08 -- STS-126/Endeavour/ULF2 undocking; 10:32am
11/29/08 -- STS-126/Endeavour/ULF2 landing; ~2:01 pm
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
Six-person crew on ISS
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1 (contingency)
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/03/08
Date:	Monday, November 03, 2008 3:00:10 PM
Attachments:	

ISS On-Orbit Status 11/03/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 2 of Increment 18. >>Today 51 years ago (1957), Soviet Chief Designer Sergei Pavlovich Korolev launched the first living passenger into orbit – the little canine "proto-cosmonaut" Laika ("Barker") with Sputnik-2 on an R7 "Semyorka".<<*

With yesterday's time change, crew work begins now at 1:00am EST and ends at 4:30pm, with the one-hour lunch break at about 7:00am.

FE-2 Chamitoff started his day with his third week-long session with the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment, using the payload software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop. *[To monitor the crewmember's sleep/wake patterns and light exposure, Greg wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list. This is Week 3 of 3 for the FE-2.]*

Before breakfast, CDR Fincke began Part 1 (of 5) of the periodic acoustic measurement protocol by deploying crew-worn acoustic dosimeters, to be carried by all crewmembers for 24 hours (with a microphone on the shirt collar). (Last time done: 9/8-9/9). *[Tonight, after about 15 hours of measurements, dosimeter data will be downloaded and the hardware power-cycled for another data take starting tonight after 8.5-hr. sleep. At that point, the crew will deploy the dosimeters statically in the station for the duration of the day, record measurements tomorrow noon and stow the instruments. Acoustic data must be taken twice per Increment, each time for the duration of the 16-hour crew workday.]*

Most of Fincke's & Chamitoff's time today was assigned to hardware prepacking for the 15-day Shuttle mission ULF2, preceded by a prepack conference with ground

specialists via S-band at ~8:05am EST, and an OBT (On-board Training) review of the STS-126/ULF2 docked timeline, followed by a discussion with MCC-H specialists via teleconference. Some highlights follow:

- *STS-126/ULF2/Endeavour, the 124th Shuttle mission (the 27th to the station), will be crewed by CDR Chris Ferguson, PLT Eric Boe, MS1 Donald Pettit, MS2/EV2 Steve Bowen, MS3/EV1 Heidemarie Stefanyshyn-Piper, MS4/EV3 Shane Kimbrough, and MS5/ Exp-18 FE-2 Sandra Magnus.*
- *ISS wake/sleep cycle will be shifted from 1:00am EST to 4:30am on FD2, then to 9:30am on FD3. The early undock time (10:32am) drives crew wakeup 2.5 hrs earlier, to 7:00am by FD14. The shift is completed by moving crew sleep 30 min earlier on FD4, and then one hour earlier each day on FD12 and 13.*
- *MPLM "Leonardo" will be installed on Node-2 on FD4; ingress same day just before Presleep. MPLM transfers start FD5 with four racks, followed by 8 racks, including the Galley (ER6), on FD6.*
- *Focused Orbiter inspection is nominally planned for FD6. However, since the installed MPLM will obstruct a small area on the lower starboard wing for Focused inspection, MPLM berthing could be delayed to FD5 if the Debris Assessment Team, in reviewing the RPM imagery on the evening of FD3, identifies an area of concern associated with the starboard wing. Late inspection will be completed in its entirety after the Shuttle undocks on FD14. Endeavour will be undocking with the OBSS (Orbiter Boom Sensor System) on the SRMS (Shuttle Remote Manipulator System) in preparation for that inspection.*
- *Four EVAs are planned during the mission. MS2, MS3, and MS4 will rotate all EVAs. General EVA tasks are:*
    - ***EVA-1** – NTA (Nitrogen Tank Assembly) transfer to Shuttle PLB, FHRC (Flex Hose Rotary Coupler) transfer to ESP-3, EFBM Cover Removal, Stbd SARJ (Solar Array Rotary Joint) Cleaning/TBA (Trundle Bearing Assembly) R&R.*
    - ***EVA-2** – CETA Cart Relocation, LEE A Lubrication, Stbd SARJ Cleaning/TBA R&R.*
    - ***EVA-3** – SARJ cleaning/TBA R&R.*
    - ***EVA-4** – Port SARJ lubing, EFBM cover install, ETVCG Install, JLP GPS Antenna Install, JEM Handrails/WIFs Install, IR and Digital Imagery of S1/P1 Radiators.*
- *Generic face-to-face handover time between Chamitoff & Magnus will be 12 hrs max; Gregory will remain on the ISS until the day before undocking and will be scheduled as an ISS crewmember.*
- *Endeavour will be powered by the SSPTS (Station-Shuttle Power Transfer System) from post-docking to just before undocking. During the mated mission when ISS solar arrays are feathered for attitude maneuvers and*

EVA operations, SSPTS may be powered off to maintain station power margin.

- *30 hrs are required for transfer ops to/from the Shuttle middeck and 105 hours for MPLM. With all the timelined activities and rack transfers scheduled, ULF2 will be a highly choreographed transfer mission. The Shuttle crew has been thoroughly trained on the details of the choreography. In addition, each day a transfer message will be uplinked, listing specific items that need to be transferred that day due to operations requiring the items.*

FE-1 Lonchakov started a new round of the periodic (monthly) preventive maintenance of RS (Russian Segment) ventilation systems in the DC1 (Docking Compartment) by cleaning the PF1 & PF2 dust collectors in its air duct system and the protective mesh screens of the V1 & V2 ventilator fans. Later, Yuri moved to the FGB (Funktsionalnyi-Grusovoi Blok) to clean the vent grills of the three SOTR (thermal control system) gas-liquid heat exchangers (GZhT-1, -2, -3).

Mike Fincke terminated IWIS (Internal Wireless Instrumentation System) software commanding and prepared for the “deep sleep” recovery of the IWIS RSU (Internal Wireless Integrated System/Remote Sensor Unit) system (listed yesterday as a discretionary entry on the “job jar” task list). *[The hardware will remain powered on for tomorrow’s (11/4) dedicated thruster firing. IWIS RSUs collect structural dynamics data on the ISS structure during specific “disturbance” events such as thruster firings, docking/undocking, etc.]*

Yuri Lonchakov conducted the regular status check and data collection on the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the LADA-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

Performing regular service on the MATRYOSHKA-R (RBO-3-2) radiation instrumentation in the SM (panel 326), Yuri Lonchakov conducted a health check on the ASTR Spectrometer and prepared it for a new round of experiment activities, downlinking all remaining data from the ALC-954 PCMCIA (Portable Computer Memory Card International Adapter) memory card via the RSK1 laptop and replacing it in the AST with a new card (ALC-955). The Spectrometer was then activated, after a functional check. *[RBO-3-2 is using the ESA/RSC-Energia experiment ALTCRISS (ALC/Alteino Long Term monitoring of Cosmic Rays on the ISS) with its Spectrometer (AST) and ALC equipment, which is periodically moved around and now located again in the SM.]*

In the JAXA JPM (JEM Pressurized Module), Chamitoff retrieved two OIWIFs (On-orbit Install Worksite Interfaces) from a standoff. With Mike Fincke, he also

unpacked and readied a JEM cargo bag containing four cables for the PROX-GPS antenna, required for HTV (H-II Transfer Vehicle) operations. *[The PROX system, mostly located in the ICS (Inter-orbit Communication System) Rack, consists of a PROX antenna, a PROX-GPS (Global Positioning System) antenna, PROX comm equipment and an HCP (Hardware Command Panel) in the JPM, except for the antenna. When the HTV approaches the ISS, the PROX antenna, which contains GPS receivers, will initiate communications with the HTV. The ISS orbital location and speed are immediately relayed to the HTV through the PROX. At the same time, data from the HTV are relayed to the ISS. In addition, the antenna relays commands sent from the ground to the HTV.]*

FE-1 Lonchakov again had an hour to himself for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residence, if she/he chooses to take it.

At ~4:20pm EST, just before sleep time, Yuri will set up the Russian MBI-12 SONOKARD (Sonocard) payload and start his second experiment session, using a sports shirt from the SONOKARD kit with a special device in the pocket for testing a new method for acquiring physiological data without using direct contact on the skin. Measurements are recorded on a data card for return to Earth. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

The CDR completed the regular monthly TVIS maintenance, inspecting the condition of harnesses, belt slats, corner bracket ropes, IRBAs (Isolation Restorative Bungee Assemblies) and gyroscope wire ropes for any damage or defects, lubricating as required plus recording time & date values. *[Mike's downlinked report: "TVIS is looking great! All wire ropes and cords looking great and pass my inspection."]*

The crew performed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

At ~4:00am EST, Mike Fincke powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, & power supply) and conducted, at 4:05am, a ham radio exchange with IES Trassierra,

Córdoba, Spain, a Secondary Education School with 900 students located between a developing area and an area of low social-economical status. Its project "Sailing through Space" will help students to broaden their knowledge in the field of space and also will be a very important tool to motivate them to study. The project is going to last two years and it will include a wide variety of activities such as observing the sky from Cordoba, visiting the workshop that the Observatory of Granada brought to the school and making trips to the observatory situated in Toledo. Questions were uplinked to Mike beforehand. *["What kind of food do you eat? Do you have a special diet?"; "Are you in contact with your family?"; "How long have you been in the ISS?"; "What do you miss the most?"; "How long does it take to go to the space?"; "What is your favourite thing up there?"; "Have you ever felt frightened?"; "What is the weight of your spacesuit?"; "What is your mission onboard?"; "How do you have a shower?".]*

No CEO (Crew Earth Observation) targets uplinked today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

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Solar Beta Angle -- 1.9 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 70 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 57046

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
11/14/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC; 7:55pm EST
11/16/08 -- STS-126/Endeavour/ULF2 docking; ~4:56pm
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/27/08 -- STS-126/Endeavour/ULF2 undocking; 10:32am
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11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch02/12/09 -- Progress M-67/32P docking

02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
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02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
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05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/02/08
Date:	Sunday, November 02, 2008 7:13:08 PM
Attachments:	

ISS On-Orbit Status 11/02/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – rest day for CDR Fincke, FE-1 Lonchakov, FE-2 Chamitoff. Ahead: Week 2 of Increment 18. We are now on Standard Time again.*

FE-1 Lonchakov performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. Additionally, the FE-1 today checked up on the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem, gathering weekly data on total operating time & "On" durations for reporting to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

FE-2 Chamitoff performed the standard sensor calibration on the CSA-O_2 (Compound Specific Analyzer-Oxygen) units #1043 & #1059, delivered on 1J, using a new calibration adapter (#1001), brought up by 30P.

Working on the MATRYOSHKA-R (RBO-3-2) radiation instrumentation in the SM (panel 326), Lonchakov turned off the AST Spectrometer, taking radiation measurements since 10/17, then removed the PCMCIA (Portable Computer Memory Card International Adapter) ALC-954 memory card and checked number and size of its data files. Card 954 was then stowed in a kit, with the AST Spectrometer remaining deactivated.

The CDR & FE-1 had their weekly PFCs (Private Family Conferences) via S-band/ audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Yuri at ~9:30am EST, Mike at ~3:40pm.

Working from the US voluntary "job jar" task list, Mike & Greg completed "deep

sleep" recovery of the IWIS RSU (Internal Wireless Integrated System/Remote Sensor Unit) system. *[IWIS RSUs collect structural dynamics data on the ISS structure during specific "disturbance" events such as thruster firings, docking/ undocking, etc.]*

The crew executed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

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02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1

05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 11/01/08
Date:	Saturday, November 01, 2008 5:40:38 PM
Attachments:	

ISS On-Orbit Status 11/01/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – light-duty day for CDR Fincke, FE-1 Lonchakov & FE-2 Chamitoff.*

As part of the crew's regular morning inspection tour, FE-1 Lonchakov conducted the routine checkup of DC1 (Docking Compartment) circuit breakers and fuses. *[The monthly checkup in the "Pirs" module looks at AZS circuit breakers on the BVP Amp Switch Panel (they should all be On) and the LEDs (light-emitting diodes) of 14 fuses in fuse panels BPP-30 & BPP-36.]*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the SM (Service Module) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

As part of the house cleaning, Yuri conducted regular maintenance inspection & cleaning on fan screens in the FGB (TsV2), DC-1 (V3) and SM (VPkhO, VPrK, FS5, FS6 & FS9). The FE-1 also cleaned the pre-filter in the Russian POTOK-150MK (150 micron) air purification subsystem.

CDR Fincke completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Lonchakov performed routine maintenance on the Russian SRVK condensate water

processor by removing & replacing its BRPK-2 (Condensate Separation & Pumping Unit)'s separator.

At ~10:15am EDT the crewmembers conducted their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-Houston and TsUP-Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

After the ground shut down the EarthKAM (EK/Earth Knowledge Acquired by Middle School Students) experiment, Gregory Chamitoff moved some of its equipment back to the US Lab (from Node-2) to support the BCAT (Binary Colloidal Alloy Test) experiment run. *[Greg's diligence in working through some Firewire-software issues was greatly appreciated in an uplink message. The EK run has netted over 1100 images.]*

The FE-2 also set up and restarted BCAT-4 operations at the Avionics Racks 2 (LAB1D1) and 3 (LAB1D2), after the recent considerable troubleshooting to get the payload running. *[The camera image was set up on Sample 3, after which Greg, with gloves on, homogenized samples 8, 9, 10, then 3 last. Immediately following the homogenization of Sample 3, the FE-2 took a few photos of the sample. Controlled by EarthKAM software, the camera is now automatically photographing Sample 3 once every hour for the next 6 days.]*

For today's VolSci (Voluntary Weekend Science) program, Mike Fincke & Greg Chamitoff had 3 hrs on their timelines for another exciting range of tests of the SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellites) experiment which include satellite spiral maneuvers for synthetic imaging mission, fuel balancing, docking using path planning, advanced path follower algorithms, failure detection and recovery using simulated failures in communications. *[Today's run (Test Session 14B) used two satellites and, if time permitted, also executed Test Session 14A with three satellites.]*

The crew completed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (FE-1).

Later, Mike transferred the exercise data files to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Working off the Russian discretionary “time permitting” task list, Lonchakov performed routine service on the Matryoshka-R radiation payload via its Lulin-5 electronics box, checking and adjusting date/time, taking readings and entering time tag.

Also off the work suggestions list, the FE-1 conducted another session for Russia's Environmental Safety Agency (EKON), making observations and taking KPT-3 aerial photography of environmental conditions on earth using the Nikon D2X with the SIGMA 300-800mm telephoto lens.

A third task item from the Russian discretionary job list for Yuri was a session of the GFI-8 "Uragan" (hurricane) earth-imaging program, using the NIKON D2X digital camera to take telephotos. *[Uplinked target zones were the Andes (general views from both side of flight track, discretionary snapshots for educational purposes), the Amazon jungle (looking for cut-down forest in Amazon basin), the Galapagos archipelago (ocean wave pattern near small islands in the northern part of the archipelago), South Andes (large glaciers flowing into fiords and lakes, focusing on the contact between glacier with water surface) and Ugra National Park (forest vegetation in the steppe, the northernmost island of the Galapagos archipelago, and Darwin Island).]*

A voluntary task item for CDR Fincke today was to fill out his first FFQ (Food Frequency Questionnaire) on the MEC. *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

Weekly Science Update *(Expedition Eighteen -- Week 1)*

3-D SPACE: In progress.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Complete.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3/4 (Binary Colloidal Alloy Test 3/4): After the 10/23 EarthKAM troubleshooting, BCAT-4 is looking forward to continuing homogenization and photography of sample 3. The homogenization of samples 8, 9 and 10 remains on

the task list if not completed along with the sample 3 operations.

BIO-4: After 16S landing, the BASE-B/-C and XENOPUS biological samples have been very quickly retrieved and handed-over to science teams. Meanwhile, KUBIK incubators telemetry data have been downlinked and are being analyzed by PD (Payload Developer) team.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): "Thanks Mike, for working through the CBPD errors and getting it to work. For the next CCISS session, you will be using a newly refurbished unit that will arrive on ULF2. Also, thanks for the great video and call downs. It really helps us troubleshoot issues and ensures the PI gets the best data possible."

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-2/CGBA-5 (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus 5): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): Due to safety concerns identified for the PLEGPAY instrument when operated in Plasma Discharge mode, the entire EuTEF platform had to be put in survival mode on 9/1. Since then, the EuTEF power feeder#1 is de-activated and no science acquisition is possible. Request has been approved at IMMT for intermittent activation for 3 of the 9 EUTEF payloads. EuTEF platform power feeder#1 has been re-activated for 8-hrs periods on 10/17, 10/19, 10/21, 10/24, 10/26 and 10/29. This only mitigates the science loss for the EXPOSE, DOSTEL and MEDET instruments. The situation implies

significant loss of science return for all EUTEF payloads. On 10/30, the ground commanding activity to erase the software instructions of the so-called “Experiment 1” (Plasma Generation) from the memory of PLEGPAY was performed nominally. A full memory dump of PLEGPAY instrument has also been performed and ground teams are now analyzing the outcome of the memory deletion. Once this activity is done the rest of the EuTEF instruments will be able to resume normal operations-- DEBIE-2: Inactive;-- DOSTEL: Inactive, part of proposed intermittent activation;-- EuTEMP: Inactive;-- EVC: Inactive;-- EXPOSE: Inactive, part of proposed intermittent activation;-- FIPEX: Inactive; -- MEDET: Inactive, part of proposed intermittent activation; -- PLEGPAY: Inactive, “Experiment 1” memory has been erased on 10/30;-- TRIBOLAB: Inactive.

FSL (Fluid Science Laboratory): FSL is nominal.

GEOFLOW: The EC (Experiment Container) has been successfully installed back into the FSL (Fluid Science Laboratory) drawer. It is planned to resume the GEOFLOW science runs after ULF2 mission and 31P undocking and 32P docking.

HDTV System Test DL (JAXA): Complete.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): In progress.

Marangoni Experiment for ISS in JAXA FPEF (Fluid Physics Experiment Facility): A part of the FPEF clean-up (preparation for the clean up) of Marangoni EXP was completed on 10/28. Once the FPEF clean-up is completed, Marangoni will resume operations.

Micro-G Clay (JAXA EPO): Complete.

MISSE (Materials ISS Experiment): Ongoing.

Moon Photography from ISS (JAXA EPO): Complete.

MOP (Motion Perception in Zero-G): Daily MOP questionnaires completed by the Space Flight Participant. Downloaded on 16S.

MSG-SAME (Microgravity Science Glovebox): Complete.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MUSCLE-G (LBP/Low Back Pain): Daily MUSCLE questionnaires completed by the Space Flight Participant. Downloaded on 16S.

NOA-1/-2 (Nitric Oxide Analyzer, ESA): Complete.

NUTRITION w/REPOSITORY: In progress.

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PCRF (Protein Crystallization Research Facility) Reconfiguration (JAXA): Complete.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): Complete.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): “Greg, you are currently scheduled to complete another week of Sleep logging next week. This will make up for the week that was lost during the SSC reload.”

SOLAR (Solar Monitoring Observatory): The present Sun visibility window has started on 10/27, but due to ISS yaw angle, SOLAR only started to track the Sun on 10/29 early morning. Some anomalies are currently being worked for SOLACES and SOVIM instruments:-- SOVIM: no science acquisition, non-nominal mode: instrument power consumption is zero, for the time being it is powered off as the ground teams are working out a recovery plan-- SOLSPEC: daily science acquisition - nominal;-- SOLACES: problem of synchronization of the instrument

microcontrollers, some work-around procedures are being implemented since the start of the Sun observation window. On 10/29, some problem with file naming of the Command Sequence scripts have led to a delay of several hours to start the science acquisition.

SOLO (Sodium Loading in Microgravity): Complete.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): Reserve.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): The four remaining ECs (Experiment Containers) have been removed by Greg from the BIOLAB Rotor B on 10/29.

CEO (Crew Earth Observations): Through 10/30 the ground has received a total of 1,118 frames of CEO images for review and cataloging (the first 6 days of Increment 18). Photos with times corresponding to CEO target request times are being reviewed first and since the last report included: Santa Barbara Coast, California (acquisition confirmed – 28 frames under review); Yellowstone NP, Wyoming (acquisition confirmed – 24 frames under review); Santa Barbara Coast, California – 53 frames under review); Lake Nasser-Toshka Lakes, Egypt (acquisition confirmed – 23 frames under review); Lake Chad, Africa (21 frames - excellent imagery acquired for continued monitoring); Niwot Ridge Tundra, Colorado (acquisition confirmed – 21 frames under review); Mt Kilimanjaro, Tanzania (17 frames - target not acquired – to be re-tried); Madrean Sky Islands, NW Mexico (acquisition confirmed – 34 frames under review); Khartoum, Sudan (acquisition confirmed – 38 frames under review); and Red River Basin, TX (acquisition confirmed – 43 frames under review). "You are off to an incredible start with sharp, well-composed imagery and lots of it! More feedback will come as we complete our reviews. Thanks for your patience as we transition from Increment 17 to 18."

CEO photo targets uplinked for today were **North African Dust Storm** *(Dynamic Event: North African Dust Storm - As ISS approached the Libyan coast, Mike & Greg were to look left of track, toward the eastern Mediterranean and eastern Egypt. The approach of a strong cold front should have created a large dust plume. Requested were panoramic views of the plume along the north coast of*

Egypt), **B.P. Structure** *(the B.P. Structure is the first impact crater crossed today. It is small so it is a very challenging target. The crater is 2 km in diameter [similar in diameter to Meteor Crater in Arizona] and its age has been dated at less than 120 million years. The crater should have been close to under track. Mapping pass was requested),* **Oasis Impact Crater** *(Oasis impact crater is larger than B.P. [18 km in diameter] and probably a little easier to recognize. The age has been dated as less than 120 million years. Mapping pass along the orbit track was requested),* and **Amazon River Delta** *(Dynamic Event: Amazon River Delta. ISS had a nadir pass over the mouths of the Amazon River. CEO researchers want to continue their long-term image documentation of this dynamic delta. The delta is 210 miles wide and the sediment discharge extends hundreds of miles out into the Atlantic Ocean. Documenting the individual islands in the delta along with the extent of the sediment plume)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
11/02/08 -- ***Daylight Saving Time (DST) ends***
11/14/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC; 7:55pm;
11/16/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/29/08 -- STS-126/Endeavour/ULF2 landing (~2:00 pm EST est.)
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation

10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/31/08
Date:	Friday, October 31, 2008 7:05:44 PM
Attachments:	

ISS On-Orbit Status 10/31/08

All ISS systems continue to function nominally, except those noted previously or below. *HAPPY HALLOWEEN!*

Before breakfast and exercise, CDR Fincke broke out and set up the equipment for today's U.S. PHS (Periodic Health Status) w/o Blood Labs exam, a clinical evaluation of Mike & Yuri Lonchakov, their first, with Gregory Chamitoff assisting as CMO (Crew Medical Officer). For the PHS (Periodic Health Status) w/o Blood Labs examination, the crew used the U.S. PCBA (Portable Clinical Blood Analyzer). *[The second part of PHS, Subjective Clinical Evaluation, was performed later in the day. All data were then logged on the MEC (Medical Equipment Computer) and the hardware stowed. The PHS exam, with PCBA analysis and clinical evaluation, is guided by special software (IFEP, In-Flight Examination Program) on the MEC laptop. While PCBA analyzes total blood composition, the blood's hematocrit is particularly measured by the Russian MO-10 protocol.]*

The FE-2 conducted another one of the periodic offloadings of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1062) with the collected water slated for processing. No samples were required.

CDR Fincke worked on the CDRA (Carbon Dioxide Removal Assembly), removing and replacing two CSVs (CDRA Selector Valves, #105 & #106), then closing out the worksite after the ground checkout of the valves. Afterwards, Mike bypassed the temperature sensor A of the CDRA Bed #201 using ISS pin kit jumpers. *[The two replaced valves would periodically fail to reach their final position when commanded, shutting down the CDRA. The ground teams successfully checked out the new valves and began a 24-hour CDRA verification run.]*

In the Service Module (SM), FE-1 Lonchakov removed the Lada-13 greenhouse from the Russian BIO-5 Rasteniya-1 ("Plants-1") experiment, installed a BKGA gas

analyzer control unit, hooked up and activated the MIS control unit, loaded new software, put in new MIS hardware and ran a hardware test in Auto mode, terminating it after ~5 hrs. *[Rasteniya-1 researches growth and development of plants under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. Lada consists of a wall-mounted growth chamber that provides long-term, ready access for crewmember interaction. It provides light and root zone control but relies on the cabin environmental control systems for humidity, gas composition, and temperature control. Cabin air is pulled into the leaf chamber, flows over the plants and vents through the light bank to provide both plant gas exchange and light bank cooling. Lada was launched to the ISS in September 2002.]*

In Node-2, FE-2 Chamitoff changed out a diffuser plate on the THC (Temperature & Humidity Control) system, taking acoustic measurements before and after the diffuser plate replacement to document the cause of the current high noise level and its mitigation.

Gregory performed another standard sensor calibration on the CSA-O_2 (Compound Specific Analyzer-Oxygen) units #1043 & #1059, delivered on 1J, using a new calibration adapter (#1001), brought up by 30P.

The CDR performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The daily IMS (Inventory Management System) maintenance was conducted today by Yuri, updating/editing the standard IMS “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The FE-2 conducted the regular bi-monthly reboots of the OCA Router and File Server SSC (Station Support Computer) laptops.

In preparation for the arrival & docking of the Japanese HTV (H-II Transfer Vehicle) later this year, the HTV Control Center (HTV-CC) in Tsukuba has conducted a weekly-long series of command and telemetry tests. *[HTV-CC successfully tested both the A- and B-string of the BSP (Baseband Signal Processor). Range & Range Rate function was also successfully confirmed as the ISS made several passes*

over a ground site in Tanegashima, Japan. During these overflights, the ground station sent a simulated HTV telemetry stream to ISS, and HTV commands were routed from the JAXA SSIPC (Space Station Integrated Promotion Center) through ISS and back to the ground site. The Heartbeat FDIR (Fault Detection, Isolation, & Recovery) test was also a success, and concluded the PROX System Checkout #1.]

Fincke & Chamitoff continued to prepare for the STS-126/ULF2 mission by prepacking hardware for return in the MPLM (Multi-Purpose Logistics Module).

The CDR reconfigured the IFM (In-Flight Maintenance) tool box drawers by installing the new drawers into the toolbox location, preparing a common crew tool kit, removing and stowing tools from the old toolbox drawers, and stowing the old empty drawers for return on ULF2.

Chamitoff filled out the regular FFQ (Food Frequency Questionnaire), his 18th, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

Before starting their exercise sessions on the TVIS treadmill, Mike & Yuri set up the video equipment for filming their subsequent workout on the treadmill for biomechanical evaluation of their performance and assessment of the hardware status by ground engineers. Afterwards, the camera gear was torn down and stowed.

The crew completed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (FE-1).

Later, Greg transferred the exercise data files to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~4:50am EDT, Yuri & Mike linked up with TsUP stowage specialists via S-band to conduct the weekly IMS tagup, discussing inventory & stowage issues,

equipment locations and cargo transfers.

At ~6:30am, Gregory had his weekly PFC (Private Family Conferences) via S-band/ audio and Ku-band/MS- NetMeeting application (which displays the uplinked ground video on an SSC laptop).

At ~9:06am, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

FE-1 Lonchakov had an hour to himself for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residence, if she/he chooses to take it.

CEO (Crew Earth Observations) photo targets uplinked for today were **Cairo, Egypt** *(the population of Cairo is about 6.8 million people [2006]. Cairo's metropolitan area has about 17.8 million people. This target is located on the banks of the Nile River in northern Egypt, immediately south of where the Nile splits into its two branches. The grayness of the city contrasts nicely with the green of the Nile delta. Looking a little right of the track and documenting land use and city boundaries),* **Wetumpka Impact Crater** *(Wetumpka was confirmed as an impact crater [shocked quartz was found in cores] in 1998. The crater is 7.6 km in diameter and is estimated to be about 83 million years old. This was a challenging target for Mike & Greg because the crater itself is a little difficult to spot due to vegetation and soil cover. The crater is located east of downtown Wetumpka, Alabama. Wetumpka is also located to the northeast of Montgomery, Alabama and to the southwest of Atlanta, Georgia. Mapping pass along the track),* **Caracas, Venezuela** *(the Venezuelan capital city is situated in a narrow valley, just inland from the Caribbean Sea coast south of a forested mountain range. Trying for detailed near-nadir views of the city. As always with this city, there were probably partly cloudy conditions),* and **Central-Arizona Phoenix** *(the Central-Arizona Phoenix site is part of the Long Term Ecological Research [LTER] suite of sites. The main objective for these sites is to document the land cover/land use change on a seasonal basis. Looking for land cover or land use boundaries and documenting with overlapping frames)*.

CEO photography can be studied at this “Gateway” website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
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11/16/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
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11/26/08 -- Progress M-66/31P launch
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11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
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07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/30/08
Date:	Thursday, October 30, 2008 10:39:10 PM
Attachments:	

ISS On-Orbit Status 10/30/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Fincke set up the camcorder equipment for taking video of FE-2 Chamitoff performing his first session of the general U.S. MedOps PFE (Periodic Fitness Evaluation) program on the CEVIS (Cycle Ergometer with Vibration Isolation), filmed via VTR (Video Tape Recorder). *[The footage was downlinked afterwards for biomechanical evaluation of the exercising crewmember and assessment of the on-orbit setup of equipment during data collection and hardware status.]*

The FE-2 then completed the PFE protocol, a monthly 1.5-hr. procedure which checks up on blood pressure and electrocardiogram (ECG) during programmed exercise on the CEVIS (Cycle Ergometer with Vibration Isolation) in the Lab. Readings were taken with the BP/ECG (blood pressure/electrocardiograph) and the HRM (heart rate monitor) watch with its radio transmitter. Fincke, who had completed the session yesterday, assisted as CMO (Crew Medical Officer). The video equipment was later stowed and MCC-Houston informed that the video could be downlinked. *[BP/ECG provides automated noninvasive systolic and diastolic blood pressure measurements while also monitoring and displaying accurate heart rates on a continual basis at rest and during exercise.]*

The SSRMS (Space Station Remote Manipulator System) was maneuvered by Robotics ground controllers as part of the ongoing ULF2 pre-launch checkout. *[The SSRMS Tip LEE (Latching End Effector) released the MBS PDGF-1 (Mobile Base System/Power & Data Grapple Fixture) and maneuvered to the ESP3 (External Stowage Platform #3) park position. The SSRMS is now in position to start the ESP3 relocation operations next Wednesday. Today's operations also included diagnostic checks on the SSRMS joints and LEE B. Systems performance was nominal, and the activity was completed ahead of schedule. ESP3 relocation to the MCAS (MBS Common Attach System) is scheduled for next Wednesday.]*

All three crewmembers performed the standard Emergency Egress Drill. *[This is a standard training exercise conducted to familiarize the crew with the location of emergency equipment (including hatches and passageways), focusing particularly on the passage along the emergency evacuation route.]*

The HTV (H-II Transfer Vehicle) PROX system checkout continued today with the HTV-CC (Control Center) successfully performing the Range & Range Rate checkout. At the end of the test the BSP (Baseband Signal Processor) was switched back to the A side in preparation for the Heartbeat FDIR (Fault Detection, Isolation, & Recovery) test tomorrow.

Mike Fincke & Greg Chamitoff continued to prepack hardware for return in the MPLM (Multi-Purpose Logistics Module).

Mike & Gregory also successfully completed their RPM (R-Bar Pitch Maneuver) Skills Training by photographing CEO (Crew Earth Observation) targets.

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Mike transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Yuri completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Lonchakov also handled the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*
11/14/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC; 7:55pm;
11/16/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit

11/26/08 -- Progress M-66/31P launch
11/29/08 -- STS-126/Endeavour/ULF2 landing (~2:00 pm EST est.)
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/29/08
Date:	Wednesday, October 29, 2008 6:52:01 PM
Attachments:	

ISS On-Orbit Status 10/29/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Fincke set up the camcorder equipment for taking video of Chamitoff and himself performing their first session of the general U.S. MedOps PFE (Periodic Fitness Evaluation) program on the CEVIS (Cycle Ergometer with Vibration Isolation), filmed via VTR (Video Tape Recorder). *[The footage was downlinked afterwards for biomechanical evaluation of the exercising crewmember and assessment of the on-orbit setup of equipment during data collection and hardware status.]*

The CDR & FE-2 then completed the PFE protocol, a monthly 1.5-hr. procedure which checks up on blood pressure and electrocardiogram (ECG) during programmed exercise on the CEVIS (Cycle Ergometer with Vibration Isolation) in the Lab. Readings were taken with the BP/ECG (blood pressure/ electrocardiograph) and the HRM (heart rate monitor) watch with its radio transmitter, with Chamitoff first assisting as CMO (Crew Medical Officer), then being assisted by Fincke in his turn. The video equipment was later stowed and MCC-Houston informed that the video could be downlinked. *[BP/ECG provides automated noninvasive systolic and diastolic blood pressure measurements while also monitoring and displaying accurate heart rates on a continual basis at rest and during exercise.]*

FE-1 Lonchakov had ~4.5h to perform periodic replacement maintenance on the Russian thermal control system's heating loop #2 (SOTR KOB-2), removing two units (BS) containing electric pumps (ENA) of the replaceable pump panel 4SPN2 and exchanging them with spares from stowage. Afterwards, Yuri also tested the 4SPN2 pump panel to ascertain its functionality. Today's maintenance leaves one remaining spare on board. Finally, the KOB-2 was turned on by Russian ground control. *[The two BS units of 4SPN2 were exchanged the last time on 8/22. Each of the two SOTR KOB loops has two redundant pump panels with two redundant*

pumps each. While in the early years of Mir and ISS the pumps were integral to the SPN panels, the current design allows them to be replaced without requiring an entire new SPN block.]

Gregory Chamitoff continued his support of the EarthKAM (Earth Knowledge Acquired by Middle Schools) program, today swapping the 60mm lens with a 180mm lens for the students. *[There are 65 schools and 4,768 students participating in this week's session. EarthKAM allows middle school students to program a digital camera onboard the ISS to photograph a variety of geographical targets for study in the classroom.]*

Mike & Greg continued to prepare for the STS-126/ULF-2 mission by prepacking hardware for return in the MPLM (Multi-Purpose Logistics Module).

CDR Fincke reconfigured the toolbox facility in Node-1, installing new drawers and rearranging old drawers. *[Mike prepared a common crew tool kit for use in Node-2, Columbus, Kibo JPM (JEM Pressurized Module) and the MPLM coming up with ULF-2, added a few tools to the ISS Leak Kit, removed/stowed tools from old drawers, and stowed old empty drawers for return on ULF-2.]*

FE-2 Chamitoff replaced the PS1 & PS2 dust filters in the FGB with new spares.

Lonchakov collected the periodic readings of potentially harmful atmospheric contaminants in the SM (Service Module), using the CMS (Countermeasure System), a component of the SKDS GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, today using preprogrammed microchips to measure for o-Xylol (1,2-Dimethylbenzol, C_8H_{10}), Methyl-Mercaptan (Methanethiol, CH_4S), and Sulphur Dioxide (SO_2).

The crew reported that the aft Airlock GLA (General Luminaire Assembly) was dim. Troubleshooting was performed on the light and power removed to protect subsequent failure of the Baseplate Ballast Assembly (BBA). Engineering is recommending replacing the Lamp Housing Assembly (LHA).

The SSRMS (Space Station Remote Manipulator System) was successfully repositioned today in preparation for the ESP-3 (External Stowage Platform 3) relocation. The PDGF-3 (Power & Data Grapple Fixture #3) was released and the arm was maneuvered and grappled PDGF-4. A base change was performed from PDGF-3 to PDGF-4. The Tip LEE (Latching End Effector) on PDGF-1 will be released tomorrow and the arm will be maneuvered to the ESP-3 park position. Additionally, the demate microswitch on the MBS (Mobile Base System) redundant string was confirmed healthy today. *[This microswitch failed to indicate demate during the MSS MCAS (Mobile Service System Common Attach System) checkout*

on 10/7.]

Yuri Lonchakov had an hour to himself for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residence, if she/he chooses to take it.

The crew executed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1). *[Maximum speed for TVIS in motorized mode is not to exceed 16.1 km/h. Fincke removed his SPDs (Subject Positioning Devices) which were required for the first seven exercise sessions for him for safety.]*

After a successful second day of the HTV PROX (H-II Transfer Vehicle/Prox System) Checkout, HTVCC (HTV Control Center) today sent the first commands to the HTV simulator at the PROX ground site via ISS.

The CDR completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Greg handled the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*
11/14/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/16/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/29/08 -- STS-126/Endeavour/ULF2 landing (~2:00 pm EST est.)
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking

02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM (P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/28/08
Date:	Tuesday, October 28, 2008 6:43:41 PM
Attachments:	

ISS On-Orbit Status 10/28/08

All ISS systems continue to function nominally, except those noted previously or below.

Yuri Lonchakov set up the hardware for the Russian MBI-21 PNEVMOKARD experiment and conducted the session, his first, which does not allow moving or talking during data recording. Kononenko will have his fifth session tomorrow. The experiment is controlled from the RSE-med A31p laptop, equipped with new software, and uses the TENZOPLUS sphygmomanometer to measure arterial blood pressure. *[PNEVMOKARD (Pneumocard) attempts to obtain new scientific information to refine the understanding about the mechanisms used by the cardiorespiratory system and the whole body organism to spaceflight conditions. By recording (on PCMCIA cards) the crewmember's electrocardiogram, impedance cardiogram, low-frequency phonocardiogram (seismocardiogram), pneumotachogram (using nose temperature sensors), and finger photoplethismogram, the experiment supports integrated studies of (1) the cardiovascular system and its adaptation mechanisms in various phases of a long-duration mission, (2) the synchronization of heart activity and breathing factors, as well as the cardiorespiratory system control processes based on the variability rate of physiological parameters, and (3) the interconnection between the cardiorespiratory system during a long-duration mission and the tolerance of orthostatic & physical activities at the beginning of readaptation for predicting possible reactions of the crewmembers organism during the their return to ground.]*

The ISS crew continued to prepare for the STS-126/ULF2 mission by prepacking hardware for return in the MPLM (Multi-Purpose Logistics Module) Leonardo.

FE-1 Lonchakov changed out the SRVK-2M multi-filtration unit and the Gas-Liquid Mixture Filter. Yuri also inspected the Sediment Trap Insert. *[The SRVK-2M converts collected condensate into drinking water and dispenses the reclaimed potable water]*.

CDR Fincke downloaded heart rate and blood pressure measurements from the CCISS (Cardiovascular & Cerebrovascular Control On Return from ISS) that had been collected passively over the past 24 hours using the Holter Monitor and Actiwatch. *[CCISS provides data to support the study of the effects of long-duration spaceflight on crew members' heart functions and their blood vessels that supply the brain. This experiment is collaborative with the Canadian Space Agency.]*

As standard procedure for newly arrived station residents, Lonchakov filled out the questionnaire for the standard Russian biomedical Braslet-M/Anketa ("bracelet/ questionnaire") test procedure. *[If desired, the crewmembers may evaluate a number of "bracelet" cuffs for their usefulness in suppressing the adverse effects of micro-G for the "newcomer" aboard the station during the acute phase of adaptation to weightlessness, if there are such indications. The "bracelets" are compression cuffs attached to a belt and worn on the upper thighs over the coveralls, intended as countermeasures against the initial micro-G effects of blood filling (vascularity) in the upper torso (heaviness and blood pulsation in the head), facial puffiness, nasal stuffiness, painful eye movement, and vestibular disorders (dizziness, nausea, vomiting). They create artificial blood accumulation in the upper thirds of the thighs, causing some of the circulating blood volume to relocate from the upper body to the lower extremities, thereby (hopefully) correcting the adverse hemodynamic effect of micro-G and thus improving the crewmember's working capability. The actual compression cuff in the Braslet units is a combination of alternating multi-layer tensile and non-tensile elements, whose distension by body movements creates elastic forces that produce the necessary pressure on the body surface. The questionnaire lists bracelet types, days worn, cuff tension used, wearing method (on body or over clothing), thigh cuff positioning, etc.]*

HTV (IH-II Transfer Vehicle (HTV) Prox System Checkout: The JAXA (Japan Aerospace Exploration Agency (JAXA) Prox system checkout continued today with another checkout on the Range and Range Rate measurement function using the PROX link over a the Tanegashima Space Center Ground Station (TNSC GS) in Japan. HTV ground support reported that they got good range data today from both sets of tests.

MSS (Mobile Servicing System) Operations: Today robotics ground controllers translated the MT (Mobile Transporter) from worksite (WS) 4 to WS6, and then on to WS7. The translation to WS6 was nominal and power & data redundancy was confirmed at Worksite 6. This fulfilled a portion of the ULF2 pre-launch checkout. The translation to WS7 was interrupted when the “+Y” worksite sensor at WS7 did not trip as expected. This was a recurrence of an anomaly which occurred when the MT translated to WS7 back on 2/1/08. The ground team recovered and completed the translation with manual commanding. Despite the resulting delay, there were no thermal issues and today’s ops were completed on schedule.

Reboost: Tonight, the ISS is scheduled to perform a reboost using the 30P Rendezvous & Docking thrusters. This 0.55 m/s delta-V burn was to set up phasing for the STS-126/ULF2 and 31P launches. The reboost is scheduled for 9:13pm EDT.

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*
11/15/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/17/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit *(UNDER REVIEW)*
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.) *(UNDER REVIEW)*
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
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04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
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05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/27/08
Date:	Monday, October 27, 2008 2:19:55 PM
Attachments:	

ISS On-Orbit Status 10/27/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 1 of Increment 18. Quote of the Day:* By Michael "Spanky" Fincke while performing TVIS assembly kit pre-pack for ULF-2 return: *"This CTB (Cargo Transport Bag) is like a piñata; stuff just goes everywhere..."*

CDR Fincke, FE-1 Lonchakov & FE-2 Chamitoff began their workday before breakfast with the periodic session of the Russian biomedical routine assessments PZEh-MO-7/Calf Volume Measurement & PZEh-MO-8/Body Mass Measurement, using the IM mass measurement device which Yuri broke down afterwards for stowage. *[Calf measurements (left leg only) are taken with the IZOG device, a custom-sewn fabric cuff that fits over the calf, using the knee and lower foot as fixed reference pints, to provide a rough index of deconditioning in zero-G and effectiveness of countermeasures. For determining body mass in zero-G, where things are weightless but not massless, the Russian IM "scales" measure the inertial forces that arise during the oscillatory motion of a mass driven by two helical metering springs with known spring constants. By measuring the time period of each oscillation of the unknown mass (the crewmember) and comparing it to the period of a known mass, the crewmember's mass is calculated by the computer and displayed.]*

Gregory worked in the Kibo JPM (JEM Pressurized Module) to power on the HTV PROX (H-II Transfer Vehicle/ Proximity Communication System) preparatory to its first checkout. *[Throughout the week, the HTV control center in Tsukuba will be sending commands and viewing telemetry in order to checkout various parts of the system when ISS overflies a ground site in Tanegashima, Japan. During these overflights, the ground station will send a simulated HTV telemetry stream to ISS and HTV commands will be routed from SSIPC through ISS and back to the ground site. The checkout will not involve any crew use of the HCP (Hardware Command Panel), but the crew will perform an HCP checkout sometime in December after the PROX functionality has been confirmed. PROX consists of an PROX antenna, a*

PROX-GPS antenna, PROX comm equipment and an HCP. With the exception of the PROX antenna, the PROX-GPS antenna and the HCP, the PROX is also installed in the JPM. When the HTV approaches the ISS, the PROX antenna, which contains GPS receivers, will initiate communications with the HTV. The ISS orbital location and speed are immediately relayed to the HTV through the PROX. At the same time, data from the HTV are relayed to the ISS. In addition, the antenna relays commands sent from the ground to the HTV.]

Mike Fincke conducted his first on-orbit session with the CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS) experiment, with Chamitoff acting as operator, by setting up and donning the Holter Monitor, donning the CBPD (Continuous Blood Pressure Device), performing the Baro Study, doffing the CBPD, and starting the 24-hr passive heart rate data collection. Data are recorded on a PCMCIA memory card, with the HRF (Human Research Facility) rack laptop for control. Data download and equipment stowage is scheduled tomorrow after the 24-hr period. *[CCISS studies the effects of long-duration spaceflight on crewmembers' heart functions and their blood vessels that supply the brain (= "cerebrovascular"). Learning more about the changes in cardiovascular & cerebrovascular systems in zero-G could lead to specific countermeasures that might better protect future space travelers. For the Baro study of CCIS, heart rate and blood pressure are being recorded for resting and timed breathing for 5 min, with no caffeine or food (water is acceptable) allowed two hours before the start of the Baro Study and no exercise prior to the Baro Study.]*

Yuri Lonchakov performed major periodic replacements on the SM (Service Module)'s ASU toilet facility, changing out replaceable parts with new components, such as a sensor unit (A8A-9060), two receptacles (PR & MP), four hoses, a T-connector, an elbow fitting, an indicator, a filter insert (F-V), and the pretreat container (E-K) with its hose. All old parts were discarded as trash. *[E-K contains five liters of pre-treat solution, i.e., a mix of H_2SO_4 (sulfuric acid), CrO_3 (chromium oxide, for oxidation and purple color), and H_2O (water). The pre-treat liquid is mixed with water in a dispenser (DKiV) and used for toilet flushing.]*

Chamitoff disconnected the thermal control MTL (Moderate Temperature Loop) supply jumper which he attached yesterday in the US Lab to an ITCS (Internal Thermal Control System) Z-panel (LAB1S3) for filling with coolant. *[The activity is in preparation for the installation of the WRS-2 (Water Recovery System 2) of the new Regenerative ECLSS in the CHeCS rack during STS-126/ULF2. All coolant lines need to be filled prior to mating them to their respective racks.]*

Greg also printed out a new cue card for the RPM (R-Bar Pitch Maneuver) operations using the 400mm lens. A tagup with ground specialist was held at

~1:50pm EDT to discuss photography details for the maneuver.

Between the two of them, Mike & Greg had ~5 hrs set aside for more cargo prepacking for STS-126/ULF-2.

Yuri performed the routine task of taking two photos of the internal part of the FGB nadir port's SSVP-StM docking cone, used for the Soyuz TMA-13/17S linkup on 10/14. These images are used to refine current understanding of docking conditions. The pictures were then transferred to OCA for subsequent downlinking. *[The objective is to take photo imagery of the scratch or scuff mark left by the head of the active docking probe on the internal surface of the passive drogue (docking cone) ring, now rotated out of the passageway. As other crewmembers before him, the FE-1 used the Nikon D1X digital still camera to take two pictures each with the hatch closed down.]*

In the JAXA JLP (JEM Logistics Pressurized Module), Mike Fincke removed a failed GLA LHA (General Luminaire Assembly/Light Housing Assembly) and two failed LHA BBAs (Baseband Assemblies), then connected the vacuum cleaner to a UOP (Utility Outlet Panel, J4) in the JPM.

The FE-2 completed another one of the periodic inspections of the RED (Resistive Exercise Device) canister cords and accessories, currently done every two weeks.

The crew executed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1). *[Maximum speed for TVIS in motorized mode is not to exceed 16.1 km/h. SPDs (Subject Positioning Devices) are required for the first seven exercise sessions for the CDR and FE-1 for safety.]*

Afterwards, Greg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Lonchakov performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The daily IMS (Inventory Management System) maintenance was conducted today also by Yuri, updating/editing the standard IMS "delta file" including stowage

locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

After temporarily removing the CBCS (Centerline Berthing Camera System) in the Node-2, Gregory set up the EarthKAM (EK) payload for a week of student photo ops. *[The first part of the setup required "borrowing" a Ku-Band Power Supply from the US Lab for use in Node-2. To minimize the impact to the setup activities for BCAT, use of a different DCS-760 camera was recommended. This will be the first session since last April, so there are many students eagerly awaiting the chance to put the camera to work. This will be the 29th time for EarthKAM aboard the ISS and the first time on Increment 18. EK is using a DCS 760 electronic still camera with 50mm (f/1.4) lens at the Node-2 window, powered by 16Vdc from a 28 Vdc adapter, taking pictures by remote operation from the ground, without crew interaction. Numerous schools are participating in this EarthKAM session. EarthKAM is an education program that enables thousands of students to photograph and examine Earth from the unique perspective of space, integrating the excitement of ISS with middle-school education. The student requests are uplinked in a camera control file to an A31p SSC (Station Support Computer) laptop which then activates the camera at specified times and receives the digital images from the camera's storage card on its hard drive, for subsequent downlink via OPS LAN.]*

On ER-2 (EXPRESS Rack 2), Chamitoff removed & replaced the GN2 (gaseous nitrogen) umbilical at the LAB1O1 UIP (Utility Interface Panel). *[A looped GN2 umbilical was flown on mission ULF 1.1. It was built for the ARIS-EXPRESS Kit but was flown on loan for temporary use on the OGS (Oxygen Generation System) rack. The OGS rack no longer requires continued use of the umbilical and so it was removed for installation on ER-2 to replace an older configuration of the umbilical which was being used on the Rack. The ARIS (Active Rack Isolation System) kit baseline calls-out the use of the looped GN2 umbilical.]*

FE-1 Lonchakov had an hour to himself for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residence, if she/he chooses to take it.

At ~2:20pm, the crewmembers convened for their standard bi-weekly teleconference with the JSC Astronaut Office (Steve Lindsey), via S-band S/G-2 audio & phone patch.

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the

Earth from space, with 324,812 from the ISS alone).

Current Time Differences: EDT/Moscow – 7 hrs; CDT/Moscow – 8 hrs (until 11/2).

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
10/29/08 -- Progress 30P reboost
11/02/08 -- *Daylight Saving Time (DST) ends*
11/14/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/16/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/29/08 -- STS-126/Endeavour/ULF2 landing
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/26/08
Date:	Sunday, October 26, 2008 10:18:14 AM
Attachments:	

ISS On-Orbit Status 10/26/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – rest day for CDR Fincke, FE-1 Lonchakov, FE-2 Chamitoff. Ahead: Week 1 of Increment 18,-- and Spanky & crew are off to a fine start.*

CDR Fincke ended his FD15 (Flight Day 15) session with the NASA/JSC experiment NUTRITION w/Repository, his first, by collecting a final urine sample upon wakeup for storage in the MELFI (Minus-Eighty Laboratory Freezer for ISS), Dewar 1/Tray B.. The sampling kit was then stowed away. Mike's next activity with this experiment will be the FD30 session. *[The current NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R +30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

The new crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the SM (Service Module) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

As part of the house cleaning, Yuri conducted regular maintenance inspection & cleaning on fan screens in the FGB (TsV2), DC-1 (V3) and SM (VPkhO, VPrK, FS5, FS6 & FS9).

FE-1 Lonchakov also performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. Additionally, the FE-1 today checked up on the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem, gathering weekly data on total operating time & "On" durations for reporting to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The three station residents had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Yuri at ~8:45am, Greg at ~10:05am, Mike at 1:30pm.

The crew executed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1). *[Maximum speed for TVIS in motorized mode is not to exceed 16.1 km/h. SPDs (Subject Positioning Devices) are required for the first seven exercise sessions for the CDR and FE-1 for safety.]*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).
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11/17/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit *(UNDER REVIEW)*
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.) *(UNDER REVIEW)*
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking

02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/25/08
Date:	Saturday, October 25, 2008 8:16:12 PM
Attachments:	

ISS On-Orbit Status 10/25/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – light-duty day for CDR Fincke, FE-1 Lonchakov & FE-2 Chamitoff.*

The crew's work/sleep cycle is back on the regular schedule: wake-up – 2:00am EDT, sleeptime – 5:30pm.

First activity this morning for CDR Fincke was to start on his Flight Day 15 session with the NASA/JSC experiment NUTRITION w/Repository. This was an all-day session, the first for Mike, of collecting urine samples several times for 24 hrs, to continue through first void tomorrow morning. *[After performing phlebotomy with the help of FE-2 Chamitoff, i.e., drawing blood samples (from an arm vein), the samples were first allowed to coagulate in the Repository for 20-30 minutes, then spun in the HRF RC (Human Research Facility/Refrigerated Centrifuge) and finally placed in MELFI (Minus-Eighty Laboratory Freezer for ISS). No thruster activity was allowed during the blood drawing. The RC was later powered off after a temperature reset to limit wear on the compressor, and cleaned. The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by supercold MELFI dewars), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

At ~10:00am EDT the crewmembers conducted their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-Houston and TsUP-Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

Gregory filled out the regular FFQ (Food Frequency Questionnaire), his 17th, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

Mike Fincke, joined later by Greg Chamitoff, conducted his first VolSci (Voluntary Science) program, an EPO (Education Payload Operations) session with "Buzz Lightyear", i.e., shooting a video of the Buzz Lightyear doll demonstrating aspects of working and living in the space environment by showing how micro-G affects familiar objects and activities.

Yuri Lonchakov performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The E18 crew executed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1). *[Maximum speed for TVIS in motorized mode is not to exceed 16.1 km/h. SPDs (Subject Positioning Devices) are required for the first seven exercise sessions for the CDR and FE-1 for safety.]*

Afterwards, Greg transferred the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Weekly Science Update *(Expedition Seventeen/Eighteen -- Week 27)*

3-D SPACE: In progress.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Close-out activities for Inc 17-ALTCRISS were performed on 10/14. Passive dosimeters and

memory cards were returned on 16S.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3/4 (Binary Colloidal Alloy Test 3/4): After the 10/23 EarthKAM troubleshooting, BCAT-4 is looking forward to continuing homogenization and photography of sample 3. The homogenization of samples 8, 9 and 10 remains on the task list if not completed along with the sample 3 operations.

BIO-4: With 17S, a package of 3 Biology experiments were launched (i.e. ROALD, XENOPUS, BASE-B/-C) using the KUBIK incubators. On 10/14, KUBIK 1 & 2 were activated and temperatures were set: +21deg C for KUBIK-1 (to support XENOPUS) and +37deg C for KUBIK-2 (to support ROALD). XENOPUS experiment containers were installed upon transfer from Soyuz and activated on 10/14/11:20am EDT. ROALD experiment containers were installed, and the centrifuge was activated around 10/14/11:33am. The ROALD experiment is controlled by an automated timeline which commands the different fixation points in time. Containers with fixed samples are then transferred to MELFI. The first insertion into MELFI was performed around 10/14/2:40pm, and the second insertion was performed some hours later around 10/14/4:15pm. The next day, the third transfer was also performed as planned and samples were inserted into MELFI around 10/15/2:16pm. The fourth and final transfer for ROALD has been nominally performed on 10/16 at around 2: 06pm. For the XENOPUS experiment, the crew performs a daily ventilation of the KUBIK. The containers for the BASE-B/-C experiment were kept in Soyuz to allow for stable temperature conditions. The experiment started on 10/18, with KUBIK-3 setup on 10/17. The experiment was installed in KUBIK-3 20min later than expected, but this has no science impact. Only one BioKit could be packed on the undocking day and the other had to be packed the day before so BASE-B/-C rearrangements were made and this was sent up via radiogram. On 10/22 the first BASE-B/-C BioKit was transferred into the Soyuz for return. Transfer of second BioKit for BASE-B/-C and closeout and transfer of XENOPUS for 16S return.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): “Mike, you are currently scheduled to complete your first CCISS two- day activity next week.”

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-2/CGBA-5 (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus 5): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): Due to safety concerns identified for the PLEGPAY instrument (when operated in Plasma Discharge mode), the entire EuTEF platform was put in survival mode on 9/1 at around 11:00am EDT (just prior to 29P undocking). Since then, the EuTEF power feeder#1 has been de-activated and no science acquisition is possible. Request has been approved for intermittent activation for 3 of the 9 EUTEF payloads. EuTEF platform power feeder#1 has been re-activated for 8-hrs periods on 10/17, 10/19 and 10/21. Planned re-activation on 10/23 was skipped because of 16S undocking. This intermittent re-activation protocol will continue every other day until safety issues are solved with the PLEGPAY instrument. This only mitigates the science loss for the EXPOSE, DOSTEL and MEDET instruments. The situation implies significant loss of science return for all EUTEF payloads. The activity to delete Experiment 1 from the memory of PLEGPAY was planned for 10/22 but was cancelled and is now planned for 10/24. Once this activity is done the rest of the EuTEF instruments will be able to resume normal operations.-- DEBIE-2: Inactive;-- DOSTEL: Inactive, part of proposed intermittent activation;-- EuTEMP: Inactive;-- EVC: Inactive;-- EXPOSE: Inactive, part of proposed intermittent activation;-- FIPEX: Inactive; -- MEDET: Inactive, part of proposed intermittent activation; -- PLEGPAY: Inactive;-- TRIBOLAB: Inactive.

FSL (Fluid Science Laboratory): FSL is nominal.

GEOFLOW: In progress.

HDTV System Test DL (JAXA): JAXA tried to downlink the missed images but failed. So, a tape was added which was on the return manifest for ULF-2.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: "Thanks for your participation in Integrated Immune. The information you gave during the 17S session helped the ground teams to better organize the session and determine exact on-orbit hardware availability. We look forward to future sessions."

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): In progress.

Marangoni Experiment for ISS (JAXA Fluid Physics Experiment Facility): The Marangoni Experiment has been completed, with the exception of the HDD (Hard Disk Drive) exchange. The PI team decided not to conduct the experiment further, because of the lack of the silicon oil buffer. Although the liquid bridge occurred, the PI is very satisfied with the results.

Micro-G Clay (JAXA EPO): Complete.

MISSE (Materials ISS Experiment): Ongoing.

Moon Photography from ISS (JAXA EPO): Complete.

MOP (Motion Perception in Zero-G): Daily MOP questionnaires completed by the Space Flight Participant. Downloaded on 16S.

MSG-SAME (Microgravity Science Glovebox): Complete.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 "Pirs".

MULTIGEN-1: Completed.

MUSCLE-G (LBP/Low Back Pain): Daily MUSCLE questionnaires completed by the Space Flight Participant. Downloaded on 16S.
NOA-1/-2 (Nitric Oxide Analyzer, ESA): NOA return items have been pre-packed for 16S return.

NUTRITION w/REPOSITORY: In progress.

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PCRF (Protein Crystallization Research Facility) Reconfiguration (JAXA): Complete.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): Complete.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): "Greg, you have completed all your Increment 17 Sleep Activities. For Increment 18, you will have: one more Actiwatch download/initialization session, one more week of Sleep logging to make up for the lost week, and then doffing the Actiwatch on the Shuttle. Mike, thanks for donning the Actiwatch and completing the download and initialization activity. Your remaining activities for Increment 18 include: Monthly downloading of the Actiwatches, 3 weeks of Sleep logging, and doffing the Actiwatch before leaving. Additional Sleep logging is above and beyond and greatly appreciated by the PI."

SOLAR (Solar Monitoring Observatory): The last Sun visibility window ended on 10/04. The instruments operated nominally, with the exception of SOLACES which encountered a synchronization problem for its two micro-controllers units. Next Sun observation window is planned to start on 10/28.-- SOVIM: waiting for the Sun;-- SOLSPEC: waiting for the Sun;-- SOLACES: waiting for the Sun.

SOLO (Sodium Loading in Microgravity): The low sodium diet (i.e. session#2) was ended in the evening of 10/13. The impact on science interpretation of second body mass measurement performed on 10/14 after crew had breakfast and midday meal is under analysis.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): Reserve.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): Completed.

CEO (Crew Earth Observations): Through 10/23 the ground has received a total of 10,302 frames of CEO images for review and cataloging (almost 1,600 frames in the last week alone). Photos with times corresponding to our CEO target request times are reviewed first and since our last report included: Two Hearted River Forest Reserve, MI (target not acquired due to clouds but excellent context views of the Sudbury and Wanapitei Impact site were acquired coincidentally); Sakura-jima Volcano, Japan (31 frames under review); Mount Unzen (31 frames under review); N Mariana Islands & Guam (8 frames - under review); Arkenu Impacts (27 frames-several best-ever frames acquired); Coweeta Forest, North Carolina (34 frames - under review); Tigris-Euphrates Delta (42 frames - target confirmed, still under review); Lake Nasser, Toshka Lakes, Egypt (28 frames - target confirmed, still under review); Santa Barbara Coast (43 frames – target acquired – under review); Volcan Colima (27 frames under review); and East Haruj Megafans (46 frames under review). "Your response this week to our target requests has been just tremendous! Thanks for you enthusiasm and excellent imagery. More feedback will come as we complete our reviews. Your beautifully detailed image of desert erosional features in central Libya will be published on NASA/GSFC's Earth Observatory website this weekend. Your image acquired in August provides an excellent illustration of the complex history of erosional processes by both air and water that have formed the modern Libyan landscape."

CEO (Crew Earth Observations) photo targets uplinked for today were **Aral Sea** *(DYNAMIC EVENT: The dramatic retreat and disappearance of the Aral Sea has been documented in Astronaut photography for decades now. ISS had a nadir pass in late morning light under clear skies. Just after the station tracked over the northern edge of the Caspian Sea, Greg & Mike were to try for oblique contextual views of the Aral region followed by nadir views of the individual remaining pools of this once large water body),* and **Madrean Sky Islands** *(this target is located in the northern reaches of Mexico's Sierra Madre Occidental which boast some of the richest biodiversity anywhere in North America. The "Sky Islands" are a veritable archipelago of cool, moist, higher-altitude pine-oak forested mountain ranges that dot the hot deserts of southern Arizona—New Mexico—northwestern Mexico. These climatological islands, situated in remote and rugged areas, are being heavily modified by logging. This fair-weather pass, just after midday, was well to the northeast of most of the target area and should have been well suited for broad contextual views to be used in the future for pinpointing specific features to photograph. After crossing the upper Grand Canyon, Greg & Mike were to look*

right of track).

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).
Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

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04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

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From: vonPuttkamer, Jesco H. (HQ-CJ000)
To: Von Puttkamer, Jesco H. (HQ-CE010);
CC:
Subject: ISS On-Orbit Status 10/24/08
Date: Friday, October 24, 2008 5:43:28 PM
Attachments: image002.gif

ISS On-Orbit Status 10/24/08

All ISS systems continue to function nominally, except those noted previously or below. Full rest day for the Inc-18 crew of CDR Michael Fincke, FE-1 Yuri Lonchakov and FE-2 Gregory Chamitoff.

Yest posadka! *(We have Landing!)* Welcome back home, Sergey Volkov, Oleg Kononenko, and Richard Garriott! After 199 days in space (197 docked to ISS), Soyuz TMA-12/16S, carrying two-thirds of the Expedition 17 crew plus the US SFP (10 days in space), **landed successfully** last night at ~11:37pm EDT in the steppes of Kazakhstan, with the crew in excellent condition**.** *The crew was transported to Kustenai, Kazakhstan via helicopter and departed for Star City, where they were received by a large gathering of guests, including Roskosmos Head Perminov (see JvP photo, below).]*

The crew's work/sleep cycle is shifting towards more regular times: Wake-up – 9:00am EDT (from 11:45pm last night), sleeptime – 5:30pm.

CDR Fincke set up the Kenwood amateur radio equipment and conducted a ham radio pass at ~1:10pm EDT with Scuola Media Statale Donato Forlani, Conversano, Italy

Due to the shortened work day, the crew completed an abbreviated physical workout program on the TVIS treadmill (FE-1), and RED resistive exercise device (CDR, FE-2). For their first seven runs on the TVIS, Mike & Yuri are using SPDs (Subject Positioning Devices) for safety.

Afterwards, Greg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

The CDR set up NASA's NUTRITION/Repository experiment hardware for his first session of urine & blood sampling scheduled tomorrow. For the phlebotomy (blood sample draw), Mike has to start fasting 8 hrs before, i.e., tonight, with only water consumption allowed. *[The Clinical Nutritional Assessment profile currently required on all U.S. Astronauts, collects blood and urine samples preflight and postflight. NUTRITION expands this protocol by also capturing inflight samples and an additional postflight sample. Furthermore, additional measurements are included for samples from all sessions, including additional markers of bone metabolism, vitamin status, and hormone and oxidative stressor tests. The results will be used to better understand the impact of countermeasures (exercise and pharmaceuticals) on nutritional status and nutrient requirements. The Clinical Nutritional Assessment profile (MR016L), first started on two Mir crewmembers and then on all ISS US crews, nominally consists of two pre-flight and one post-flight analysis of nutritional status, as well as an in-flight assessment of dietary intake using the FFQ (Food Frequency Questionnaire). The current NUTRITION project expands MR016L testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI/Minus Eighty Degree Celsius Laboratory Freezer for ISS), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

Lonchakov performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Currently carried open on Greg Chamitoff's "job jar" task list are four jobs, at his discretion:

- FSL-VMU (Fluid Science Laboratory/Video Management Unit) troubleshooting (requires 2 hrs advance notice to COL-CC/Oberpfaffenhofen),
- BLB-INC-ECS (Biolab Incubator Experiment Containers) exchange (requires 2 hrs advance notice to COL-CC/Oberpfaffenhofen),
- BCAT-4 (Binary Colloid Alloy Test 4) sample homogenizing
- MSG (Microgravity Science Glovebox) Glove Ring search and separation into old/expired & new units.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*
11/14/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/16/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit *(UNDER REVIEW)*
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.) *(UNDER REVIEW)*
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

16S crew Volkov, Kononenko, Garriott at Shkalovskiy, returning from Kustenai, Kazakhstan, 10/24/08

ОНАВТ

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/23/08
Date:	Thursday, October 23, 2008 12:21:28 PM
Attachments:	

ISS On-Orbit Status 10/23/08

All ISS systems continue to function nominally, except those noted previously or below. *Day 10 of joint E17/18 operations.* ***Last day in space for CDR Volkov, FE-1 Kononenko, SFP Garriott.***

The crew's work/sleep cycle remains shifted for the Soyuz undocking: Wake-up – 8:00am EDT (from 10:00pm last night), sleeptime – 11:45pm.

For the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function), CDR-18 Fincke and FE-2 Chamitoff performed their Blood Collection and final Liquid Saliva collection, assisting each other for the blood draws. The Saliva Return Pouches and Blood Sleeves were then stored at ambient temperature on the Soyuz for return to ground. *[IMMUNE protocol requires the collection to occur first thing post-sleep, before eating, drinking and brushing teeth, and all samples are stored at ambient temperature. Along with NUTRITION (Nutritional Status Assessment), INTEGRATED IMMUNE samples & analyzes participant's blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects.]*

The FE-2 retrieved and stowed the four passive FMK (Formaldehyde Monitoring Kit) sampling assemblies deployed by him on 10/21 in the Lab (at P3, below CEVIS) and Service Module (SM, at the most forward handrail, on panel 307), to catch any atmospheric formaldehyde on a collector substrate for subsequent analysis on the ground. *[Two monitors each are usually attached side by side, preferably in an orientation with their faces perpendicular to the direction of air flow.]*

In preparation for the Soyuz departure tonight, Gregory also ensured proper closure of the protective window shutters in the Lab and Kibo module and powered down the SM Kenwood ham radio equipment, to prevent RF interference with the Soyuz

radio comm.

Oleg Kononenko & Yuri Lonchakov closed out and transferred the last Russian biotech payloads for return on TMA-12. *[Specifically: BIO-4 (Xenopus & BBC) BTKh-6, BIO-12/ REGENERATION, BTKh-29 (ZHENSHEN-2/Ginseng-2), BTKh-10/ KONYUGATSIYA, TKhN-9 (KRISTALLIZATOR/Crystallizer), BTKh-1,-2, & -4 (GLICOPROTEID/Glycoprotein, MIMETIK-K, KAF, VAKTSINA-K/Vaccine), and BTKh-14/BIOEMULSION.]*

Mike Fincke performed some troubleshooting for EarthKAM, after ground testing indicated that the EKAM Flight Software (FSW) does not download camera images when image processing within the camera takes longer than ~2.5-seconds.

With Soyuz TMA-12 no longer available as contingency CRV (crew return vehicle) for the coming Increment, Lonchakov transferred its three Emergency Procedures ODF (DAS EhP) books to the new CRV, TMA-13, docked at the FGB nadir port.

After several hours of final cargo transfers, CDR Volkov updated the IMS (Inventory Management System) with the transfer data.

In the JAXA Kibo JPM (JEM Pressurized Module), Gregory turned off the Argon gas supply from the CGSE (Common Gas Support Equipment) Upper GBUs (Gas Bottle Units).

Fincke collected the Actiwatch device of the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) study from VC-15 Garriott for temporary stowage. After downloading the data from his own Actiwatch to the HRF-1 (Human Research Facility 1) laptop for subsequent downlink, Chamitoff also stowed his, Mike's and the FE-1's devices and turned off the SLEEP software. *[To monitor his sleep/wake patterns and light exposure, crewmembers don the special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout this run. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

Preparations for the undocking will begin at about 3:00pm, with Volkov de-installing a lighting fixture (SD1-5M) from the Soyuz Orbital Module, for later reuse.

The CDR then enters the 16S Descent Module and performs the standard pre-undocking communications check, as Lonchakov in the SM configured the STTS comm system for undocking.

With the returning crewmembers all ingressed in the Soyuz spacecraft, Sergey & Oleg are to activate the spacecraft (~3:55pm), followed by closing the Soyuz and

DC1 hatches, assisted by Mike Fincke and Greg Chamitoff. The departing Soyuz crew then starts the standard one-hour leak check on the Soyus-to-DC1 vestibule.

The return to Earth of the TMA-13 spacecraft tonight will proceed along the following general event sequence (all times EDT):

- ISS attitude control handover to RS --- 6:20pm;
- ISS in free drift for DC-1 hooks open --- 6:40pm;
- ISS in free drift for undocking --- 8:12:30pm;
- Hooks Open command --- 8:13:30pm; automatic undocking from DC-1 on DO15;
- **Separation springs action** (delta-V ~0.12 m/sec) --- 8:16:30pm;
- Manual separation burn (15 sec, ~0.54 m/sec) --- 8:19:30pm;
- ISS attitude control handover to US --- 9:55pm;
- Deorbit Burn start (delta-V 115.2 m/sec) --- 10:45:24pm;
- Deorbit Burn complete --- 10:49:44pm
- **Tri-Module separation** (140 km) --- 11:10:34pm;
- Atmospheric entry (102 km, with ~170 m/sec) --- 11:13:32pm;
- Max G-load (34 km alt) --- 11:20:09pm;
- Parachute deploy command (10.7 km alt) --- 11:22:04pm;
- **16S Landing** (DO1) --- 11:37pm EDT; 6:37am Moscow DMT (10/24); 9:37am local Kazakhstan (10/24);
- Local Sunset --- 7:18am (10/24), 6:18pm local.

[Note: Kazakhstan time = GMT+6h; EDT+10h. Moscow DMT = EDT+7h.]

Prior to starting their sleep period at ~11:45pm, the remaining ISS crewmembers are to complete a number of post-undocking tasks:

- Downlinking the TV footage of the spacecraft departure to the ground,
- Disassembling the TV equipment which covered the spacecraft departure and returning its component to their regular places,
- Turning off the KUBIK-1 & -3 thermostatic containers,
- Performing the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM,
- Conducting the daily IMS (Inventory Management System) updating/editing,
- Completing the periodic checkout/verification of IP-1 airflow sensors in the various RS hatchways, and
- Initializing the SLEEP Actiwatch for Greg Chamitoff from the HRF-1 laptop,

The E18 crew also completes an adjusted physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR-18, FE-1-18), and RED resistive exercise device (FE-2).

Afterwards, Greg transfers the exercise data file to the MEC (Medical Equipment

Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

CEO (Crew Earth Observations) photo targets uplinked for today were **East Haruj Megafans** *(ancient, now defunct rivers [sourced in the Tibesti Mountains to the south of the site when the Sahara Desert was much wetter] have laid down vast spreads of sediment as a series of large fans hundreds of km long and wide. As rivers shifted position they produced networks of criss-crossing stream channels covering the entire surface of megafans. Earth's megafans may be the best analog for widespread "intercrater plains" on Mars. This analog is being applied for the first time in ongoing research),* and **Georgia Coastal Ecosystems** *(the study area is a barrier island and marsh complex located on the central Georgia coast in the vicinity of Sapelo Island, located between Savannah and Jacksonville), and Sevilleta Wildlife Area, New Mexico (the Sevilleta Wildlife Area is primarily situated near either side of the Rio Grande River in central New Mexico. Detailed mapping views along the ISS track were requested.*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
11/02/08 -- ***Daylight Saving Time (DST) ends***
11/14/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/16/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit *(UNDER REVIEW)*
11/26/08 -- Progress M-66/31P launch
11/29/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.) *(UNDER REVIEW)*
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
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03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit

05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
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12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/22/08
Date:	Wednesday, October 22, 2008 10:46:13 AM
Attachments:	

ISS On-Orbit Status 10/22/08

All ISS systems continue to function nominally, except those noted previously or below. *Day 9 of joint E17/18 operations (last full day for Volkov, Kononenko, Garriott).*

Day/night cycle: Wake-up – 1:00am, followed by **short sleep period from 9:00am-1:00pm**, for second sleeptime at 10:00pm tonight (until 8:00am tomorrow morning).

FE-2 Chamitoff and CDR-18 Fincke conducted their second standard 30-min Shuttle RPM (R-bar Pitch Maneuver) skill training, using the NIKON D2Xs digital still camera with 400 & 800mm (by teleconverter) lenses at SM (Service Module) windows 6 & 8 (facing in flight direction) to take CEO (Crew Earth Observations) target imagery with manual focusing. The practice run involved mapping of ground features with images having 40-50% overlap and about 20 images in each sequence. Afterwards, the obtained OBT (onboard training) images were downlinked by Gregory to the ground for analysis (~3:55am). *[The RPM drill prepares crewmembers for the bottom-side mapping of the Orbiter at the arrival of the Shuttle (STS-126/Endeavour/ULF2 on 11/16. During the RPM at ~600 ft from the station, the "shooters" have only ~90 seconds for taking high-resolution digital photographs of all tile areas and door seals on Discovery, to be downlinked for launch debris assessment. Thus, time available for the shooting will be very limited, requiring great coordination between the two headset-equipped photographers and the Shuttle pilot.]*

Floating in the Soyuz TMA-12/16S Orbital Module (BO), CDR Volkov dismantled and removed the LKT local temperature sensor commutator (TA251MB) of the BITS2-12 onboard telemetry system, along with its PZU-1M ROM (read-only memory) unit, now no longer required since the BO is to be jettisoned before 16S reentry. *[The electronics was stowed on ISS for reuse in a future Progress vehicle.]*

FE-1 Kononenko terminated the charging of the TTM-2 and "Kelvin-Video" batteries and checked out the equipment for another run of the Russian KPT-2 science

payload BAR-RM. Afterwards, data gathering started using the RSE-1 laptop, with downlinking via BSR-TM channel. *[Objective of the payload is to experiment with ISS leak detection based on environmental data anomalies (temperature, humidity, and ultrasound emissions) at leak locations. The payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/ thermometer (TTM-2), an ultrasound analyzer (AU-01), and a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station. Measurements are taken in specific zones (13 in SM PkhO and 4 in DC1), both with lights & fans turned on and off.]*

FE-1-18 Lonchakov conducted an observation & operations checkout on the KPT-3 aerial photography equipment for Russia's Environmental Safety Agency (EKON), which uses the NIKON D2X camera to document environmental conditions in Russia.

Kononenko later used the Russian IPD-NH_3 Draeger tubes, on a cartridge belt with a pump, to check the cabin air for NH_3 (ammonia, from possible urine spillage), followed by the periodic air sampling with the AK-1M adsorber around the SM work table. The samplers were stowed in the Soyuz 16S Descent Module for analysis on the ground.

Major science activities in the RS (Russian Segment) by Oleg Kononenko & Yuri Lonchakov today concerned the biotechnical/biomedical payloads BIO-12/ REGENERATION with its two PLANARIA containers, BTKh-31 (ANTIGEN), KUBIK-3 (set On to +6 degC), BTKh-8 (BIOTREK), which the Flight Engineers transferred from the SM to the Soyuz for return to Earth, and ESA's BIO-4 (ventilating the BIO-4 sample in the thermostatic container KUBIK-1).

VC-15 Richard Garriott, assisted in part by Russian crewmembers, worked on his daily onboard program which today included –

- SLEEP Actiwatch logging;
- Phone tagup with consultant team at TsUP via VHF-1;
- SSTV (Slow-Scan TV) ham session (City of Shchelkovo)
- PCG (Protein Crystal Growth) photography;
- PCG transfer to Soyuz;
- Video blogs;
- Earth photography; and
- Copying data & image files to HDD (Hard Disk Drive) for return.

In preparation for STS-126/ULF-2 arrival and the MPLM (Multi-Purpose Logistics Module) Leonardo docking with the SSRMS (Space Station Remote Manipulator

System), Chamitoff & Fincke installed the CBCS (Centerline Berthing Camera System) at the Node-2 Nadir hatch, powered it up and checked it out. Afterwards, the CBCS electronics cables were disconnected to avoid hatch "dragthroughs". *[Should there be any changes to the CBCS configuration between now and ULF-2, another CBCS checkout may be required. Leonardo will be transferred from the Shuttle cargo bay with the SSRMS and berthed at the Node-2 Nadir Port CBM (Common Berthing Mechanism).]*

In addition, Gregory performed a checkout of the nadir CBM (Common Berthing Mechanism) in Node-2.

Also for ULF-2, Greg & Mike worked ~2:35h in the US Airlock, preparing EVA (Extravehicular Activity) tools for the planned four spacewalks, including configuring the gear, CL (Crewlock) bags, the Large ORU (Orbit Replaceable Unit) bag, the Staging Bag, and Grease Guns for the SARJ (Solar Array Rotary Joint) repair activities. (See below for More on this).

FE-1-18 Lonchakov took the periodic readings of potentially harmful atmospheric contaminants in the SM, using the CMS (Countermeasure System), a component of the SKDS GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, today using preprogrammed microchips to measure for Isopropanol ("rubbing alcohol", C_3H_8O), Methanol ("wood alcohol", CH_3OH) and Toluene (methylbenzene, C_7H_8).

Additionally, Yuri performed the periodic checkout/verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the passageways SM PrK (Transfer Compartment) – RO (SM Working Compartment), PkhO (SM Transfer Tunnel) – RO, PkhO – DC1, PkhO – FGB PGO, FGB PGO – FGB GA, and FGB GA–Node-1.

CDR-18 Fincke meanwhile conducted the periodic atmospheric sampling in the center of the Lab, SM and COL (Columbus Orbital Laboratory) with the U.S. GSCs (Grab Sample Containers), except for #1041.

Kononenko completed the periodic collection of air samples, including checking for Freon, in the SM & FGB using the AK-1M adsorber, recording date, time & location. Kits and pouches were then stowed for return to Earth

The FE-1 also used the standard ECOSFERA equipment, set up yesterday, to conduct microbial air sampling runs for the MedOps SZM-MO-21 experiment, with the POTOK Air Purification System temporarily powered down, taking samples from cabin surfaces along with samples from crewmembers for sanitation and disease studies. The sample tubes were then stowed in the Kriogem-03 refrigerator for

return on TMA-11. *[The equipment, consisting of an air sampler set, a charger and power supply unit, provides samples to help determine microbial contamination of the ISS atmosphere, specifically the total bacterial and fungal microflora counts and microflora composition according to morphologic criteria of microorganism colonies.]*

After the short sleep period, Yuri will conduct the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Oleg is to take care of the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Volkov & Kononenko have their regular pre-descent PMCs (Private Medical Conferences), Oleg at 3:10pm EDT, Sergey at 3:40pm.

Sergey and Oleg will be finishing up packing and stowing return cargo on 16S, and Mike & Greg have additional time reserved for continuing pre-packing for ULF-2.

The crew executes their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR-18, FE-2), TVIS treadmill (CDR/2.5h, FE-1/2.5h), and RED resistive exercise device (FE-1-18, FE-2) and VELO bike with bungee cord load trainer (FE-1-18).

Later, The FE-2 transfers the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~1:30pm EDT, Gregory sets up the G1 video camcorder with MPC (Multipurpose Converter) and IPU (Image Processing Unit), and at ~1:40pm the combined ISS crews conducted their traditional **Change-of-Command** ceremony, as Expedition 17 crewmembers Sergey Volkov & Oleg Kononenko turn ISS operations over to the Expedition 18 crew of Michael Fincke, Yuri Lonchakov and Gregory Chamitoff. With this, stewardship of the space station is officially transferred to the new crew. *[As part of the Change-of-Command ceremony, the Russian crewmembers signed two copies of the formal Russian handover protocol document certifying RS handover/acceptance. The first copy remains on ISS, the second copy will be*

returned to the ground on Soyuz TMA-12.]

EVA/EMU Preparations: Mike Fincke & Greg Chamitoff were lauded by MCC-H spacewalk specialists for "a great job getting the suits ready for ULF2 despite the difficulties in locating some of the parts. We appreciate your patience in helping us get the airlock sorted out and ready for EVA." Today's job for Mike & Greg: inspecting the large EVA trash bag, prepping and modifying the trigger throw on the SARJ (Solar Array Rotary Joint) grease guns and starting tool configuration for EVA 1. Today's timeline has 2hr 35min reserved for tool config, plus there are 2 more hours scheduled on 11/6 to complete the ULF2 preparations/EVA tool configuring.

16S Return to Earth: The return to Earth of the TMA-12 spacecraft is planned to proceed along the following approximate event sequence (all times EDT):

- ISS attitude control handover to RS --- 6:20pm;
- ISS in free drift for DC-1 hooks open --- 6:40pm;
- ISS in free drift for undocking --- 8:12pm;
- Hooks Open command --- 8:13:30pm; automatic undocking from DC-1 on DO15;
- Separation springs action (delta-V ~0.12 m/sec) --- 8:16pm;
- Manual separation burn (15 sec, ~0.54 m/sec) --- 8:19pm;
- ISS attitude control handover to US --- 9:55pm;
- Deorbit Burn start (delta-V 115.2 m/sec) --- 10:45:19pm;
- Deorbit Burn complete --- 10:49:41pm
- Tri-Module separation (140 km) --- 11:10:31pm;
- Atmospheric entry (102 km, with ~170 m/sec) --- 11:13:29pm;
- Max G-load (34 km alt) --- 11:20:12pm;
- Parachute deploy command (10.7 km alt) --- 11:22:04pm;
- 16S Landing (DO1) --- 11:37pm EDT; 6:37am Moscow DMT (10/24); 9:37am local Kazakhstan (10/24);
- Local Sunset --- 7:18am (10/24), 6:18pm local.

[Note: Kazakhstan time = GMT+6h; EDT+10h. Moscow DMT = EDT+7h.]

<u>What the Soyuz TMA-12 crew will experience during their reentry/descent tomorrow (10/23):</u>

For the reentry, Volkov, Kononenko and Garriott will wear the Russian Kentavr anti-G suit. *[The Kentavr garment is a protective anti-g suit ensemble to facilitate the return of a long-duration crewmember into the Earth gravity. Consisting of shorts, gaiters, underpants, jersey and socks, it acts as countermeasure for circulatory disturbance, prevents crewmember from overloading during descent and increases orthostatic tolerance during post-flight adaptation. Russian crewmembers are also advised to ingest fluid-electrolyte additives, viz., three sodium chloride tablets*

during breakfast and after the midday meal, each time with 300 ml of fluid, and two pills during the meal aboard Soyuz before deorbit.]

Before descent:
Special attention will be paid to the need for careful donning of the medical belt with sensors and securing tight contact between sensors and body.

During preparation for descent, before atmosphere reentry, crewmembers settle down comfortably in the Kazbek couches, fasten the belts, securing tight contact between body and the seat liner in the couch.

During de-orbit:
Dust particles starting to sink in the Descent Module (SA) cabin is the first indication of atmosphere reentry and beginning of G-load effect. From that time on, special attention is required as the loads increase rapidly.

Under G-load effect during atmosphere reentry the crew expects the following experience:
Sensation of G-load pressure on the body, burden in the body, labored breathing and speech. These are normal sensations, and the advice is to "take them coolly". In case of the feeling of a lump in the throat, this is no cause to "be nervous". This is frequent and should not be fought. Best is to "try not to swallow and talk at this moment". Crew should check vision and, if any disturbances occur, create additional tension of abdominal pressure and leg muscles (strain abdomen by pulling in), in addition to the Kentavr anti-G suit.

During deployment of pilot parachute (0.62 & 4.5 square meters), drogue chute (16 sq.m.) and main (518 sq.m.) chutes the impact accelerations will be perceived as a "strong snatch". No reason to become concerned about this but one should be prepared that during the parachutes deployment and change ("rehook") of prime parachute to symmetrical suspension, swinging and spinning motion of the SA occurs, which involves vestibular (middle ear) irritations.

It is important to tighten restrain system to fasten pelvis and pectoral arch. Vestibular irritation can occur in the form of different referred sensations such as vertigo, hyperhidrosis, postural illusions, general discomfort and nausea. To prevent vestibular irritation the crew should "limit head movement and eyes movement", as well as fix their sight on motionless objects.

Just before the landing (softened by six small rocket engines behind the heat shield):
Crew will be prepared for the vehicle impact with the ground, with their bodies fixed along the surface of the seat liner in advance. "Special attention should be paid to arm fixation to avoid the elbow and hand squat" (instruction). Landing speed: ~9.9

m/sec.

After landing:
Crew should not get up quickly from their seats to leave the SA. They were advised to stay in the couch for several minutes and only then stand up. In doing that, they should limit head and eyes movement and avoid excessive motions, proceeding slowly. They and their body should not take up earth gravity in the upright position too quickly.

CEO (Crew Earth Observations) photo targets uplinked for today were **Tigris-Euphrates Delta** *(ISS pass for this target is in early afternoon light with clear skies expected. As the station tracked southeastward down the Tigris-Euphrates valley, Greg & Mike were to look right of track for the delta region as they approached the NW end of the Persian Gulf. Trying for short-lens, contextual views of the area for a baseline, seasonal documentation of the state of the river and its environment),* **Lake Nasser, Toshka Lakes, Egypt** *(on this early afternoon pass with clear skies Greg & Mike had a nadir pass over the northeastern part of the CEO target area. Using the long lens settings for detailed views of northern Lake Nasser and the Aswan dam area),* **Santa Barbara Coast, California** *(this target is a Long Term Ecological Research [LTER] site centered near Santa Barbara, CA. On this early afternoon pass, clear skies were expected over the land areas as Greg & Mike approached from the NW. Using the long lens settings and looking just right of track for a detailed mapping of the Santa Inez Mountains from Lompoc in the west to just north of Ventura to the east),*and **Volcan Colima** *(less than 6 minutes after the ISS encounter with the Santa Barbara Coast target, as the station continued down the W coast of Mexico, Greg & Mike had a nadir pass over this active volcano. Actually comprised of two eruptive centers, Nevado de Colima and Volcan de Colima, this target is challenging because of diurnal cloud formation near the summits. If clouds permitted, the crew was to try for detailed views of this volcanic complex, including the cones and surrounding volcanic deposits)*.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

Week 27 Scheduled Main Activities:

- *Thu. (10/23):* SLEEP, IMMUNE, FMK stow, Pld xfers, Hatches closure, Soyuz undock & land; IP-1.
- *Fri. (10/24):* Ham pass, NUTRITION s/u, COL FSL VMU troubleshoot, BLB incubator ECS xchange, BCAT-4.
- *Sat. (10/25):* NUTRITION, Ham pass, WPC, FFQ, VolSci EPO, SAMS PCMCIA check, Node-1 cleanup.

- *Sun. (10/26):* NUTRITION, Station cleaning, PFCs.

ISS Orbit (as of this morning, 9:03am EDT [= epoch]):
Mean altitude -- 352.0 km
Apogee height -- 354.3 km
Perigee height -- 349.7 km
Period -- 91.58 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0003369
Solar Beta Angle -- -50.7 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 70 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56857

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
10/23/08 -- Soyuz TMA-12/16S undock (DC1 nadir, 8:16pm) & land (11:37pm) = 10/24 -- 9:37am Kazakhstan)
11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*
11/15/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/17/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit *(UNDER REVIEW)*
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.) *(UNDER REVIEW)*
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola

02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/21/08
Date:	Tuesday, October 21, 2008 11:11:01 PM
Attachments:	

ISS On-Orbit Status 10/21/08

All ISS systems continue to function nominally, except those noted previously or below. *Day 8 of joint E17/18 operations.*

Day/night cycle: Wake-up – 1:00am EDT, sleeptime – 4:30pm.

Aboard the station, the E17/18 crew rotation/handover activities continued nominally, today for the last day. *[Kononenko and Lonchakov had ~1.5h between them for dedicated FE/FE handover activities, focusing today on Rodnik urine transfer and EDV water sampling, as listed in the relevant Handover (RPS) Book section 10 (SOZh). In addition, there are "generic" handovers where crewmembers are scheduled together to complete various designated standard tasks.]*

For the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function), CDR Fincke, FE-2 Chamitoff and SFP Garriott collected their third liquid, later the first dry saliva sample before breakfast. The dry saliva collection continued throughout the day today with collections occurring at five different time points. All samples were stored at ambient temperature. Gregory took three more dry samples during the day. *[IMMUNE protocol requires the collection to occur first thing post-sleep, before eating, drinking and brushing teeth, and all samples are stored at ambient temperature. Along with NUTRITION (Nutritional Status Assessment), INTEGRATED IMMUNE samples & analyzes participant's blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected at intervals during the collection day using a specialized book that contains filter paper. The liquid saliva collections require that the crewmember soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations.]*

Upon wakeup, FE-1-18 Yuri Lonchakov terminated his first SONOKARD experiment session for the long-term Russian sleep study MBI-12, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

Fincke & Chamitoff performed the regular inspection and checkout of the HMS RSP (Health Maintenance System/Respiratory Support Pack).

Mike & Greg also had about half an hour reserved to work on the CMRS (Crew Medical Restraint System), stowed in the CHeCS (Crew Health Care Systems) rack, performing the periodic checkout and inspection of the system for upcoming standard CMO (Crew Medical Officer) proficiency training. *[The crewmembers inspected the CMRS for cracks in the board and/or metal fastener exposed on top of CMRS (found some time ago on the ground units), either of which could provide a high-voltage defibrillation ground path from the patient to ISS structure. The board-like CMRS allows strapping down a patient on the board with a harness for medical attention by the CMO who is also provided with restraints around the device. The device can be secured to the ISS structure within two minutes to provide a patient restraint surface for performing emergency medical procedures, such as during ACLS (Advanced Cardiac Life Support). It can also be used to transport a patient between the station and the Orbiter middeck. It isolates the crew and equipment electrically during defibrillations and pacing electrical discharges, accommodates the patient in the supine zero-G positions, provides cervical spine stabilization and, for a three-person crew, can also restrain two CMOs during their delivery of medical care.]*

FE-1 Kononenko & FE-1-18 Lonchakov conducted the MO-22 Sanitary-Epidemiological Status check, part of the Russian MedOps program done usually before Soyuz departures. *[To monitor for microflora, Oleg & Yuri collected samples from surface areas of interior panels and hardware at various places in the Service Module (SM), and the FGB, also from each other, using cotton swabs and special test tubes which were then stowed in 16S for return to the ground.]*

The CDR conducted an overview of the CEVIS cycle ergometer with Yuri Lonchakov to help him with the CEVIS equipment. *[This was originally supposed to happen over the weekend, but it was dropped because of conflicting activities.]*

Fincke took pictures of the S1 Radiator from the Soyuz 16S “Blister” window and SM window 13 using the 80-400mm lens. From each window, Mike shot photos at four different settings.

Yuri & Oleg also gathered water samples in the Russian Segment (RS) from the Service Module (SM) SVO-ZV Water Supply System, specifically from EDV containers filled from the ATV “Jules Verne”. All samples were prepared for return on TMA-12.

Also for return on Soyuz, Kononenko removed the SPD differential pressure indicator/dosimeter assemblies of the Matryoshka-R radiation monitoring payload and transferred them to the DM. *[Matryoshka automatically takes radiation measurements in the SM and DC-1 docking compartment for studies of on-orbit radiation and long-term dose accumulation, using six SPD dosimeters deployed throughout the RS as well as in a spherical body-simulating Matryoshka-R phantom.]*

In the JAXA Kibo JPM (JEM Pressurized Module), Chamitoff activated the JEMRMS (Japanese Experiment Module/Robotic Manipulator System), then conducted Checkout 1 on its Main Arm in space. The maneuvers were observed by the SSRMS (Space Station Remote Manipulator System) video cameras. *[After powering up the RLT (RMS Laptop), CCP (Camera Control Panel) and RMS Monitors, and adjusting settings including updating the DOUG (Dynamic Onboard Ubiquitous Graphics) laptop application with real-time data, RMS function was checked out for dynamic response, region check function, Arm Bus communication, Monitor split screen performance and RMS function. Afterwards, data were to be prepared for downlink, the Arm Bus Monitor turned off, MDP (Management Data Processor) set to Standby and all systems deactivated. Background: The externally mounted JEMRMS is composed of two arms: the 10-m-long MA (Main Arm) and a 2-m-long small fine arm (the latter to be delivered on a future mission). Both arms have six independent joints, to provide dexterity very similar to the human arm. The internal robotic control workstation, known as JEMRMS Console, is used for manipulating the RMS. Remote television cameras are mounted on both arms, enabling the crew to control the arms from inside the JPM.]*

In preparation for their return to gravity in two days, Volkov & Kononenko undertook the second session of their fifth and final training session of the Russian MO-5 MedOps protocol of cardiovascular evaluation in the below-the-waist reduced-pressure device (ODNT, US: LBNP) on the Russian VELO ergometer, assisting each other as CMO (Crew Medical Officer). The activity was then closed out. *[The one-hour assessment, supported by ground specialist tagup (VHF) and*

telemetry monitoring from Russian ground sites (at 6:11am EDT), uses the Gamma-1 ECG equipment with biomed harness, skin electrodes and a blood pressure and rheoplethysmograph cuff wired to the cycle ergometer's instrumentation panels. The Chibis ODNT provides gravity-simulating stress to the body's cardiovascular/ circulatory system for evaluation of Malenchenko's orthostatic tolerance (e.g., the Gauer-Henry reflex) after several months in zero-G. The preparatory training generally consists of first imbibing 150-200 milliliters of water or juice, followed by two cycles of a sequence of progressive regimes of reduced ("negative") pressure, set at -20, -25, -30, and -35 mmHg for five min. each, then -25, -30, and -35 mmHg (Torr) for 10 min. each plus 30mmHg for 5 min. while shifting from foot to foot at 10-12 steps per minute, while wearing a sphygmomanometer to measure blood pressure. The body's circulatory system interprets the pressure differential between upper and lower body as a gravity-like force pulling the blood (and other liquids) down. Chibis data and biomed cardiovascular readings are recorded. The Chibis suit (not to be confused with the Russian "Pinguin" suit for spring-loaded body compression, or the "Kentavr" anti-g suit worn during reentry) is similar to the U.S. LBNP facility (not a suit) used for the first time on Skylab in 1973/74, although it appears to
accomplish its purpose more quickly.]

Working together as part of the handover program, Yuri & Oleg transferred liquid waste (urine) from EDV-U containers to the Progress 30P Rodnik BV tankage.

Gregory performed the periodic deployment of four passive FMK (Formaldehyde Monitoring Kit) sampling assemblies in the Lab (at P3, below CEVIS) and SM (at the most forward handrail, on panel 307) for two days, to catch any atmospheric formaldehyde on a collector substrate for subsequent analysis on the ground. *[Two monitors each are usually attached side by side, preferably in an orientation with their faces perpendicular to the direction of air flow.]*

CDR Fincke was scheduled for cleaning the Node-1 Smoke Detector #2.

In preparation for the installation of the Regenerative ECLSS (Environmental Control & Life Support System) racks during the ULF-2 flight, Fincke also filled the MTL supply jumpers. *[The jumpers are required to be filled prior to mating them to their respective racks.]*

Major science activities in the RS (Russian Segment) by Sergey Volkov today concerned the biomedical experiment BIO-2/BIORISK kit, which the CDR transferred from the SM to the Soyuz for return to Earth, and BIO-4, ventilating the BIO-4 sample in the thermostatic container KUBIK-1. *[The four BIO-4 experiments, developed by scientists from Germany, Belgium, Switzerland, Italy and France, include research in bacterial physiology, immune cell function and*

developmental biology. Two experiments (BBB/BASE B & BBC/BASE C) study how bacteria cope and adapt in the spaceflight environment, being exposed to parameters such as microgravity, cosmic radiation, space electromagnetism and vibrations. Xenopus studies the development of cane toad tadpoles (Xenopus laevis) in spaceflight. The fourth experiment is ROALD looks at the "ROle of Apoptosis in Lymphocyte Depression". BBB, BBC & SEN will return on Soyuz TMA-12/16S.]

VC-15 Richard Garriott, assisted in part by Russian crewmembers, worked on his daily onboard program which today included –

- SLEEP Actiwatch logging;
- Phone tagup with consultant team at TsUP via VHF-1;
- SSTV (Slow-Scan TV) ham session (City of Shchelkovo)
- 2 ham radio sessions (Malaysia, Austin, TX);
- PRK Visual Acuity evaluation;
- MUSCLE-G (LBP/Low Back Pain) questionnaire;
- Video blogs;
- Earth photography; and
- Copying data & image files to HDD (Hard Disk Drive) for return.

Garriott, Chamitoff, Fincke, Volkov and Kononenko had their regular PMCs (Private Medical Conferences), via S-band/audio & Ku-band/video, Richard at ~5:45am EDT, Greg at ~10:30am, Mike at ~11:50am, Sergey at ~12:40pm, Oleg at ~1:00pm.

Sergey conducted the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the DC1-to-Soyuz tunnel, and the FGB-to-Soyuz and FGB-to-Node passageway. *[This is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently six persons, and one of the two Russian SKV air conditioners still off (SKV-1), having run out of service life.]*

At ~12:20pm, Volkov & Lonchakov prepared two copies of the formal Russian handover protocol document certifying RS handover/acceptance as part of the standard Change-of-Command procedures scheduled tomorrow. *[Two copies of the ISS RS Handover Protocol were printed out for signature by Volkov, Kononenko and Lonchakov. The first copy remains on ISS, the second copy will be returned to the ground on Soyuz TMA-12.]*

CDR Volkov had another 2:25h set aside for packing return equipment for stowage on Soyuz 16S.

About 4:50hrs worth of pre-packing of return cargo was also completed by Mike Fincke for STS-126/ULF-2.\

Sergey performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Lonchakov took care of the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

At ~9:30am EDT, the crew downlinked a 20-min. PAO video message of greetings to the 16th International Space Olympiad for Schoolchildren in Korolev. *[The International Space Olympiad for Schoolchildren is conducted annually by the City of Korolev's Council of Education jointly with RSC-Energia. This time around it's the XVI Olympiad that is taking place from 10/15-26 in Korolev, dedicated to the 70th Anniversary of the City of Korolev and to the 45th Anniversary of Valentina N. Tereshkova's flight to space. High school students from Korolev, Moscow Region, USA, and the UK are among the participants of the International Space Olympiad. The best of delegates will come to TsUP to see the ISS crew during a comm session.]*

For his (initial) use of the TVIS treadmill, Mike Fincke installed SPD (Subject Positioning Device) top assemblies for safety, required for his first seven TVIS uses.

The E17/18 crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-1-18, FE-2), TVIS treadmill (CDR-18), and VELO bike with bungee cord load trainer (CDR, FE-1-18). Sergey's & Oleg's exercise regimen today was accounted for by their Chibis/ODNT training activity.

Afterwards, Oleg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

In preparation for a microbial air sampling session scheduled tomorrow, Kononenko unstowed and set up the MedOps SZM-MO-21 ECOSFERA equipment, initiating charging on the Ecosphere power pack (BP) and activating the KRIOGEM-03 refrigerator for the samples. *[The equipment, consisting of an air sampler set, a charger, power supply unit, and incubation tray for Petri dishes, determines microbial contamination of the ISS atmosphere, specifically the total bacterial and*

fungal microflora counts and microflora composition according to morphologic criteria of microorganism colonies.]

Lonchakov set up the TTM-2 and "Kelvin-Video" batteries for charging for another operational run of the Russian KPT-2 science payload BAR-RM. Charging will be terminated tomorrow (10/22), with data gathering starting afterwards using the RSE-1 laptop, with downlinking via BSR-TM channel. *[Objective of the payload is to experiment with ISS leak detection based on environmental data anomalies (temperature, humidity, and ultrasound emissions) at leak locations. The payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/thermometer (TTM-2), an ultrasound analyzer (AU-01), and a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station. Measurements are taken in specific zones (13 in SM PkhO and 4 in DC1), both with lights & fans turned on and off.]*

CEO (Crew Earth Observations) photo targets uplinked for today were **Mount Unzen** *(Mount Unzen volcano is located east of the city of Nagasaki. This volcano has been active during the last 10,000 years and is responsible for some pretty spectacular pyroclastic flows [fast moving currents of hot gas and rock which travel away from the volcano at speed generally greater than 80km/h]. The latest robust activity occurred from 1990-1995 when a lava dome formed at the summit and the resulting pyroclastic flows [temperatures in pf's can reach about 1,000 degrees C] were responsible for fatalities),* **Sakura-jima Volcano** *(Sakura-jima is one of Japan's most active volcanoes. It is located in a part of Kagoshima bay. In 1914 the lava from an eruption created new land that connected the former island to the Osumi Peninsula),* **N Mariana Islands & Guam** *(the Northern Mariana Islands consists of 15 islands. ISS orbital track took the station near the southern islands of Saipan, Tinian and Rota. There are few images of these islands due to the sleep schedule of ISS crews and weather. Lows clouds were probably around but it was hoped that Greg still was able to capture some of the islands. Of particular interest are the fringing coral reefs surrounding the islands),* and **Arkenu 1 and Arkenu 2 Impact Craters** *(Arkenu 1 and 2 are a rarely exposed double impact structure created by a 500 m diameter pair of asteroids. Located in southeastern part of the Libyan Desert, Arkenu 1 is 6.8 km in diameter and Arkenu 2 is 10 km. Both have been dated as less than 140 million years old. Detailed images of the structures of both craters were requested).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

Week 27 Scheduled Main Activities:

- *Wed. (10/22):* RPM skill trng2, BITS-LKT removal, IPD-NH3/GSC/CMS sampling, BIO-12 xfer, CBCS install, BTKh-31/-8 xfers, KPT-3 ops, MO-21, BIO-4, Change of Command, IP-1, PMCs.
- *Thu. (10/23):* SLEEP, IMMUNE, FMK stow, Pld xfers, Hatches closure, Soyuz undock & land; IP-1.
- *Fri. (10/24):* Ham pass, NUTRITION s/u, COL FSL VMU troubleshoot, BLB incubator ECS xchange, BCAT-4.
- *Sat. (10/25):* NUTRITION, Ham pass, WPC, FFQ, VolSci EPO, SAMS PCMCIA check, Node-1 cleanup.
- *Sun. (10/26):* NUTRITION, Station cleaning, PFCs.

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
10/23/08 -- Soyuz TMA-12/16S undock (DC1 nadir, 8:16pm) & land (11:37pm) = 10/24 -- 9:37am Kazakhstan)
11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*
11/14/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/16/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit *(UNDER REVIEW)*
11/26/08 -- Progress M-66/31P launch
11/29/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.)
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
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04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/20/08
Date:	Monday, October 20, 2008 5:02:16 PM
Attachments:	

ISS On-Orbit Status 10/20/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 27 of Increment 17. Day 7 of joint E17/18 operations.*

Crew wake-up – 1:00am EDT; sleeptime – 4:30pm.

Aboard the station, the E17/18 crew rotation/handover activities continued nominally. *[Kononenko and Lonchakov had ~30 min. between them for dedicated FE/FE handover activities, focusing today on SVO water supply system sampling, as listed in the relevant Handover (RPS) Book section 10. In addition, there are "generic" handovers where crewmembers are scheduled together to complete various designated standard tasks.]*

CDR-18 Michael Fincke performed Rack outfitting in the JPM, installing a HCP/GPS (Hardware Command Panel/Global Positioning System) cable & cable guard, routing it in front of the ICS/PROX (Inter-orbit Communication System/Proximity Communication System) Rack, and installing the cable from the ICS Rack to the JPM hatch for connection to the Lab RWS (Robotics Workstation). *[The ICS is Japan's unique system for uplinking & downlinking data, images, and voice data between Kibo and the Mission Control Room at TKCS (Tsukuba Space Center). The ICS Rack houses the ICS-PM (Pressurized Module) subsystem that enables data communications between Kibo and TKSC through the Japanese DRTS (Data Relay Test Satellite) known as Kodama. In addition, the ICS Rack includes the PROX that will be used for the HTV (H-II Transfer Vehicle) rendezvous and berthing. PROX consists of a PROX antenna, a PROX-GPS antenna, PROX comm equipment and an HCP. With the exception of the PROX antenna, the PROX-GPS antenna and the HCP, the PROX is also installed in the JPM. When the HTV approaches the ISS, the PROX antenna, which contains GPS receivers, will initiate communications with the HTV. The ISS orbital location and speed are immediately relayed to the HTV through the PROX. At the same time, data from the HTV are relayed to the ISS. In addition, the antenna relays commands sent from the ground*

to the HTV.]

FE-1 Kononenko conducted another session with the Russian biomedical MBI-15 "Pilot-M"/NEURO signal response experiment after setting up the workplace and equipment, with Volkov, who had conducted MBI-15 yesterday, assisting. Afterwards, the Pilot-M & Neurolab-2000M gear was closed down and stowed. *[MBI-15 requires a table, ankle restraint system, eyeball electrodes for an EOG (electrooculogram), and two hand controllers (RUO & RUD) for testing piloting skill in "flying" simulations on a laptop (RSK1) under stopwatch control, as well as for studying special features of the psychophysiologic response of cosmonauts to the effects of stress factors in flight.]*

Kononenko took and downloaded the periodic sensor readings of the Russian "Pille-MKS" (MKS = ISS) radiation dosimetry experiment which has ten sensors placed at various locations in the Russian segment (DC1, SM starboard & port cabin windows, ASU toilet facility, control panel, etc.), then re-deployed the sensors. The memory card was stowed for return to Earth. *[Nine of the ten dosimeters are read manually.]*

Sergey Volkov, Oleg Kononenko and SFP Richard Garriott spent three hours in the TMA-12 Descent Module (SA) to conduct the Soyuz descent drill, a standard training exercise for every crew returning on a Soyuz. The exercise, which strictly forbids any command activation (except for switching the InPU display), was supported by a tagup and discussions with ground instructor at TsUP/Moscow via S-band. *[The session includes a review of the pertinent ODFs (operational data files), specifically the books on Soyuz Ascent & Descent Procedures, Emergency Descents, and Off-Nominal Situations, crew responsibilities when executing the flight program, visual crew recognition of SUS (Entry Control System) failures, spacesuit procedures, etc., with special emphasis on operations with the Neptune-ME cockpit console. The training uses a Descent Simulator application on the RSK1 laptop. During the actual descent, Volkov, as Soyuz CDR, will occupy the middle couch, with Garriott in the right seat and Kononenko in the Descent Module's left Kazbek couch. Pending the final State Commission decision at about 3.5h before undocking, 16S return is expected for 10/23 (next Thursday), with undocking at 8:15pm EDT and landing near Arkalyk/Kazakhstan at ~11:36pm (9:36am Kazakhstan time on 10/24). See below for details.]*

After the JEM RMS (Robotic Manipulator System) checkout Part 4 on 10/19, Greg Chamitoff started up the POC DOUG (Portable Onboard Computers/Dynamic Onboard Ubiquitous Graphics) application for a ~30 min. procedures review of tomorrow's RMS checkout Part 1. *[Checkout #1 is a test of the JEMRMS Region Check Function, by "flying" the arm in Manual mode and Joint Auto mode. In addition, Greg will perform a dynamic response test by moving designated joints in*

Joint Auto Mode.]

The FE-2 also worked with CDR-18 Mike Fincke in the US Airlock, resizing an EMU (Extravehicular Mobility Unit) and making other preparations for the ULF-2 spacewalks. *[One EMU was resized for MS-2 Steve Bowen for nominal use on ULF-2. Other activities involved pre-gathering and partitioning of EMU components for contingency use on ULF-2 or emergency undock transfer.]*

Greg and Mike had another 70 min. reserved on their timelines for pre-packing ULF-2 return cargo.

Yuri performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Lonchakov also completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

CDR Volkov performed the last one of the daily visual status checks on the running DAKON-M hardware in the second session of the Russian experiment TEKh-15/ IZGIB (“Bend”), tagging up with the ground, downlinking data, closing down operations and de-installing the equipment. *[The activity required visual control of hardware operations three times a day and report to the ground. The first IZGIB session, for checkout, was conducted on 9/23. IZGIB has the objective to help update mathematical models of the ISS gravitation environment, using accelerometers of the Russian SBI Onboard Measurement System, the GIVUS high-accuracy angular rate vector gyrometer of the SUDN Motion Control & Navigation System and other accelerometers for unattended measurement of micro-accelerations at science hardware accommodation locations - (1) in operation of onboard equipment having rotating parts (gyrodynes, fans), (2) when establishing and keeping various ISS attitude modes, and (3) when performing crew egresses into space and physical exercises.]*

Yuri Lonchakov collected the periodic water samples from the Russian water supply system (SVO-ZV) for return on Soyuz 16S and analysis on the ground.

As another handover activity, Sergey & Yuri performed the periodic (monthly) functional closure test of the Vozdukh CO_2 (carbon dioxide) removal system’s spare

emergency vacuum valves (AVK), in the spare parts kit. See CDRA item, below. *[The AVKs are crucial because they close the Vozdukh's vacuum access lines in the event of a malfunction in the regular vacuum valves (BVK) or a depressurization in the Vozdukh valve panel (BOA). Access to vacuum is required to vent CO_2 during the regeneration of the absorbent cartridges (PP).*

FE-1 Kononenko completed another routine radiation data monitoring & logging session for flow & dose power data with the MATRYOSHKA-R radiation payload and its LULIN-5 electronics box. The memory cards were prepared for return on 16S.

For Volkov & Kononenko, it was time to complete the first 1.5-hr. part of their final training session in the "Chibis" ODNT suit as standard preparation of cosmonauts for returning into gravity (the second part is scheduled for tomorrow). *[The below-the-waist reduced-pressure device ODNT (US: LBNP) in the "Chibis" garment provides gravity-simulating stress to the body's cardiovascular/circulatory system for reestablishing the body's orthostatic tolerance (e.g., the Gauer-Henry reflex) after the six-month stay in zero-G. Sergey's & Oleg's ODNT protocol today consisted of first imbibing 150-200 milliliters of water or juice, followed by a sequence of progressive regimes of reduced ("negative") pressure, set at -15, -25, -35 and -40 mmHg for five minutes each, then at -20, -30, and -40 mmHg, 10 minutes in each mode, and at -30 mmHg for 5 min, while shifting from foot to foot at 10-12 steps per minute. The body's circulatory system interprets the pressure differential between upper and lower body as a gravity-like force pulling the blood (and other liquids) down.]*

Lonchakov conducted the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the DC1-to-Soyuz tunnel, and the FGB-to-Soyuz and FGB-to-Node passageway. *[This is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently six persons, and one of the two Russian SKV air conditioners still off (SKV-1), having run out of service life.]*

Major science activities in the RS (Russian Segment) by Yuri Lonchakov today focused BIO-4, ventilating the BIO-4 sample in KUBIK-1. *[The four BIO-4 experiments, developed by scientists from Germany, Belgium, Switzerland, Italy and France, include research in bacterial physiology, immune cell function and developmental biology. Two experiments (BBB/BASE B & BBC/BASE C) study how bacteria cope and adapt in the spaceflight environment, being exposed to parameters such as microgravity, cosmic radiation, space electromagnetism and vibrations. Xenopus studies the development of cane toad tadpoles (Xenopus laevis) in spaceflight. The fourth experiment is ROALD looks at the "ROle of*

Apoptosis in Lymphocyte Depression". BBB, BBC & SEN will return on Soyuz TMA-12/16S.]

VC-15 Richard Garriott, assisted in part by Russian crewmembers, worked on his daily onboard program which today included –

- SLEEP Actiwatch logging;
- Soyuz descent training with Volkov & Kononenko;
- Ham radio session (Pinehurst School);
- Internet/NetMeeting conference with Challenger Center;
- Symbolic (commemorative) activity;
- PRK Visual Acuity evaluation;
- MUSCLE-G (LBP/Low Back Pain) questionnaire;
- MOP-G (Motion Perception; vestibular adaptation to changes in micro-G);
- Video blogs;
- Earth photography; and
- Copying data & image files to HDD (Hard Disk Drive) for return.

In the US Lab, Greg Chamitoff de-installed the UOP DCP (Utility Outlet Panel/ Display & Control Panel) bypass power cable to the VTR (Video Tape Recorder) at the Lab & Cupola RWS (Robotics Work Stations), now no longer required for a while.

As part of handovers, FE-1-18 Lonchakov was checked out on the CEVIS cycle ergometer and its maintenance (for example, the CEVIS Contingency Controller has no data uploading or saving capability.)

The E17/18 crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), RED resistive exercise device (FE-2, CDR-18) and VELO bike with bungee cord load trainer (FE-1-18). Sergey's & Oleg's exercise regimen today was accounted for by their Chibis/ODNT training activity.

Afterwards, Mike transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

In preparation for the following PAO TV event, the FE-2 set up and activated the VDS MPC (Video Distribution System/Multi-Purpose Converter) with its four downlinks for transmitting G1 camcorder imagery. Later (~12:00pm), the MPC was powered off again.

At 1:20pm EDT, all crewmembers, including SFP Garriott, gathered in the US

segment for the “traditional” live televised SFP/Joint Crew News conference, with US media gathered at NASA Centers (~20 min.).

At ~4:10pm, just before sleep time, Yuri Lonchakov will set up the Russian MBI-12 SONOKARD (Sonocard) payload and start his first experiment session, using a sports shirt from the SONOKARD kit with a special device in the pocket for testing a new method for acquiring physiological data without using direct contact on the skin. Measurements are recorded on a data card for return to Earth.
[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember’s physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]

BRP-M Failure: After some steam or smoke was observed coming from the Russian SRV-K (Condensate Water Processor) hot water tap in the SM and the BRP-M (Water Distribution & Heating Unit) body exhibited elevated temperature, the crew deactivated the system and closed all related valves, then replaced the BRP-M with an on-board spare.

CEO (Crew Earth Observations) photo targets uplinked for today were **Mount Unzen** *(Mount Unzen volcano is located east of the city of Nagasaki. This volcano has been active during the last 10,000 years and is responsible for some pretty spectacular pyroclastic flows [fast moving currents of hot gas and rock which travel away from the volcano at speed generally greater than 80km/h]. The latest robust activity occurred from 1990-1995 when a lava dome formed at the summit and the resulting pyroclastic flows [temperatures in pf's can reach about 1,000 degrees C] were responsible for fatalities),* **Sakura-jima Volcano** *(Sakura-jima is one of Japan's most active volcanoes. It is located in a part of Kagoshima bay. In 1914 the lava from an eruption created new land that connected the former island to the Osumi Peninsula),* **N Mariana Islands & Guam** *(the Northern Mariana Islands consists of 15 islands. ISS orbital track took the station near the southern islands of Saipan, Tinian and Rota. There are few images of these islands due to the sleep schedule of ISS crews and weather. Lows clouds were probably around but it was hoped that Greg still was able to capture some of the islands. Of particular interest are the fringing coral reefs surrounding the islands),* and **Arkenu 1 and Arkenu 2 Impact Craters** *(Arkenu 1 and 2 are a rarely exposed double impact structure created by a 500 m diameter pair of asteroids. Located in southeastern part of the Libyan Desert, Arkenu 1 is 6.8 km in diameter and Arkenu 2 is 10 km. Both have been dated as less than 140 million years old. Detailed images of the structures of both craters were requested).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

Week 27 Scheduled Main Activities:

- *Tue. (10/21):* MO-22, MBI-12, RSP checkout, CMRS checkout, JEMRMS checkout, SVO EDV sampling, ODNT/LBNPO closeouts, RBO-3-1, PAO; Rodnik xfer, PMCs, PFE (FE-2), BIO-2, MO-21, KPT-1 chg., FMK deploy.
- *Wed. (10/22):* RPM skill trng2, BITS-LKT removal, IPD-NH3/GSC/CMS sampling, BIO-12 xfer, CBCS install, BTKh-31/-8 xfers, KPT-3 ops, MO-21, BIO-4, Change of Command, IP-1, PMCs.
- *Thu. (10/23):* SLEEP, IMMUNE, FMK stow, Pld xfers, Hatches closure, Soyuz undock & land; IP-1.
- *Fri. (10/24):* Ham pass, NUTRITION s/u, COL FSL VMU troubleshoot, BLB incubator ECS xchange, BCAT-4.
- *Sat. (10/25):* NUTRITION, Ham pass, WPC, FFQ, VolSci EPO, SAMS PCMCIA check, Node-1 cleanup.
- *Sun. (10/26):* NUTRITION, Station cleaning, PFCs.

ISS Orbit (as of this morning, 8:19am EDT [= epoch]):
Mean altitude -- 352.1 km
Apogee height -- 354.4 km
Perigee height -- 349.8 km
Period -- 91.58 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0003359
Solar Beta Angle -- -57.0 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 40 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56825

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
10/23/08 -- Soyuz TMA-12/16S undock (DC1 nadir, 8:16pm) & land (11:37pm) = 10/24 -- 9:37am Kazakhstan)
11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*
11/14/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/16/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit *(UNDER REVIEW)*
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.) *(UNDER*

REVIEW)
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/19/08
Date:	Sunday, October 19, 2008 12:15:41 PM
Attachments:	

ISS On-Orbit Status 10/19/08

All ISS systems continue to function nominally, except those noted previously or below. *Day 6 of joint E17/18 operations. Sunday – not a rest day for CDR Volkov, FE-1 Kononenko, FE-2 Chamitoff, CDR-18 Fincke, FE-1-18 Lonchakov & SFP Garriott. Ahead: Week 27 (last) of Increment 17.*

The crew's work/sleep cycle remains at the one-hour earlier wake-up time of 1:00am EDT; sleeptime tonight – 4:30pm.

Aboard the station, the E17/18 crew rotation/handover activities continued nominally. *[Volkov, Kononenko, Fincke and Lonchakov had ~5:00 hrs between them for dedicated CDR/CDR & FE/FE handover activities, focusing today on Payloads, Crew data support, Medical equipment, RSE Installation & hookup to ZVENO-B units, Elektron BZh pressurization, as listed in the relevant Handover (RPS) Book sections 10, 19, 20, 21. In addition, there are "generic" handovers where crewmembers are scheduled together to complete various designated standard tasks.]*

After wakeup, FE-2 Chamitoff & SFP (Space Flight Participant) Garriott downloaded the daily SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data from their Actiwatches to the HRF-1 (Human Research Facility 1) laptop. Richard is participating in the SLEEP experiment for NASA. *[To monitor the crewmember's sleep/wake patterns and light exposure, crewmembers wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

Before breakfast (and brushing teeth), Chamitoff and Fincke started their second session with the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function), collecting one wet saliva sample. SFP Garriott is also participating in this medical test. *[IMMUNE protocol requires the collection to occur first thing post-sleep, before eating, drinking*

and brushing teeth, and all samples are stored at ambient temperature. Along with NUTRITION (Nutritional Status Assessment), INTEGRATED IMMUNE samples & analyzes participant's blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected at intervals during the collection day using a specialized book that contains filter paper. The liquid saliva collections require that the crewmember soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations.]

FE-1-18 Yuri Lonchakov performed the periodic maintenance of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #2 of the regenerable dual-channel filtration system. The process will be terminated at ~4:00pm EDT. Bed #1 regeneration was performed yesterday. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently (last time: 9/29 & 9/30).]*

CDR Volkov conducted the (currently daily) visual status check on the running DAKON-M hardware in the second session of the Russian experiment TEKh-15/ IZGIB ("Bend"), tagging up with the ground, downlinking data and restarting the data taking afterwards. *[The activity runs till 10/20, requiring visual control of hardware operations three times a day and report to the ground. The first IZGIB session, for checkout, was conducted on 9/23. IZGIB has the objective to help update mathematical models of the ISS gravitation environment, using accelerometers of the Russian SBI Onboard Measurement System, the GIVUS high-accuracy angular rate vector gyrometer of the SUDN Motion Control & Navigation System and other accelerometers for unattended measurement of micro-accelerations at science hardware accommodation locations - (1) in operation of onboard equipment having rotating parts (gyrodynes, fans), (2) when establishing and keeping various ISS attitude modes, and (3) when performing crew egresses into space and physical exercises.]*

Major science activities in the RS (Russian Segment) by Yuri Lonchakov today focused on work with the microbiological payload BIO-4 (ventilating the BIO-4 sample in KUBIK-1). *[The four BIO-4 experiments, developed by scientists from Germany, Belgium, Switzerland, Italy and France, include research in bacterial physiology, immune cell function and developmental biology. Two experiments (BBB/BASE B & BBC/BASE C) study how bacteria cope and adapt in the spaceflight environment, being exposed to parameters such as microgravity, cosmic*

radiation, space electromagnetism and vibrations. Xenopus studies the development of cane toad tadpoles (Xenopus laevis) in spaceflight. The fourth experiment is ROALD looks at the "ROle of Apoptosis in Lymphocyte Depression". BBB, BBC & SEN will return on Soyuz TMA-12/16S.]

CDR Volkov conducted another session each with the Russian biomedical MBI-15 "Pilot-M"/NEURO signal response experiment after setting up the workplace and equipment, with FE-1 Kononenko assisting the CDR. Afterwards, the Pilot-M & Neurolab-2000M gear remained configured for Oleg's session tomorrow. *[MBI-15 requires a table, ankle restraint system, eyeball electrodes for an EOG (electrooculogram), and two hand controllers (RUO & RUD) for testing piloting skill in "flying" simulations on a laptop (RSK1) under stopwatch control, as well as for studying special features of the psychophysiologic response of cosmonauts to the effects of stress factors in flight.]*

In the JAXA Kibo/JPM (JEM Pressurized Module), Greg Chamitoff & Mike Fincke activated the RLT (Robotics Laptop Terminal) of the JEMRMS (JEM Robotic Manipulator System), then reviewed and checked the DOUG (Dynamic Onboard Ubiquitous Graphics) files and conducted the RMS C/O-4 (Checkout #4). *[For C/O-4, Greg was to "fly" the JEMRMS MA (Main Arm) around the EFU13 (Exposed Facility Unit 13) on the JLP (JEM Logistics Pressurized Section) module to capture target images using the television camera on the MA EE (End Effector) for calibration purposes. This was to be followed by so-called "inching" operations, as a crew-in-the-loop demonstration to verify how small a command the crewmember can input using the hand controllers in Manual Mode (this inching operation is expected to be used on Flight 2J/A and subsequent flights if the RLT (Ready-to-Latch) judgment for a P/L (payload) berthing is not OK and the operator is requested to get the P/L closer to an EFU. <u>Background</u>: The externally mounted JEMRMS is composed of two arms: the 10-m-long MA (Main Arm) and a 2-m-long small fine arm (the latter to be delivered on a future mission). Both arms have six independent joints, to provide dexterity very similar to the human arm. The internal robotic control workstation, known as JEMRMS Console, is used for manipulating the RMS. Remote television cameras are mounted on both arms, enabling the crew to control the arms from inside the JPM.]*

Oleg Kononenko completed the routine daily servicing of the SOZh system (ECLSS/ Environment Control & Life Support System) in the SM, including the periodic checkup on the Russian POTOK-150MK(150 micron) air filter unit of the SOGS air revitalization subsystem, gathering weekly data on total operating time & "On" durations for reporting to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The daily IMS (Inventory Management System) maintenance was conducted today by Sergey Volkov, updating/editing the standard IMS “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

As part of checking out the JAXA SCOF (Solution Crystallization Observation Facility) in the Kibo JPM (JEM Pressurized Module), CDR-18 Fincke retrieved the Reference Cell cartridge from the SCOF and removed the MMA TAA (Microgravity Measurement Apparatus/Tri-Axial Accelerometer) the from the cell. *[Similar to the operation and functionality of the US IWIS (Internal Wireless Instrumentation System), MMA is a network of wireless units distributed throughout the Japanese module. Each unit connects to an external TAA.]*

After the FE-2 broke out the standard auditory test equipment, Mike Fincke, Oleg Kononenko, Sergey Volkov, Yuri Lonchakov and Greg Chamitoff each took the periodic O-OHA (on-orbit hearing assessment) test, a 30-min. NASA environmental health systems examination to assess the efficacy of acoustic countermeasures, using a special MEC (Medical Equipment Computer) laptop application. It was Greg’s fourth O-OHA session, the fifth for Sergey & Oleg and the first for Mike & Yuri. *[The O-OHA audiography test involves minimum audibility measurements for each ear over a wide range of frequencies (0.25-10 kHz) and sound pressure levels, with the crewmembers using individual-specific Prophonics earphones, new Bose ANC headsets (delivered on 30P) and the SLM (sound level meter). To conduct the testing, the experimenter is supported by special EarQ software on the MEC, featuring an up/down-arrow-operated slider for each test frequency that the crewmember moves to the lowest sound pressure level at which the tone can still be heard. The baseline test is required not later than about Flight Day 14 for each new Expedition and is then generally performed once per month. Note: There have been temporary hearing deficits documented on some U.S. and Russian crewmembers, all of which recovered to pre-mission levels.]*

Greg performed troubleshooting on the laptop which supports the BCAT-4. If successful, the FE-2 was to activate the payload for his VolSci (Voluntary Weekend Science) program, setting up the camera image on Sample 3, homogenizing and taking some manual photos of the Sample until alignment and focus are satisfactory. EarthKAM was then to take over with automated photos of Sample 3 every hour for six days. *[If problems persist with getting the BCAT-4 system to operate, Greg was to homogenize samples 8, 9 and 10 for 10 minutes each, then gently re-stow the BCAT-4 SGSM (Slow Growth Sample Module).]*

Chamitoff also checked the Node-2 nadir hatch for sufficient clearance for the planned setup of new EarthKAM operations the week of 10/27, allowing enough

space for positioning the camera at the window and provide access to its aiming and focusing.

The FE-2 & CDR-18 also conducted the regular pre-launch checkout of the RWS (Robotics Workstations), first the Lab RWS, then the Cupola RWS, including testing the DCP (Display & Control Panel) and RHC (Rotational Hand Controller) switches for the subsequent SSRMS (Space Station Remote Manipulator System) ops.

After calibrating the RWS RHC & THC (Translational Hand Controller), the two crewmembers then took the SSRMS on its planned 1-hr. checkout maneuver, grappling the PDGF-1 (Power & Data Grapple Fixture 1) on the MBS (Mobile Base System).

Lonchakov & Volkov configured the Russian RSE2 laptop and installed cabling to connect it to the two new ZVENO-B ("Link-B") modems behind SM panel 437, and then exercised the system by uploading new antivirus software and running a scan on RSE1.

Continuing the extended leak checking of the spare BZh Liquid Unit (#056) for the Elektron O_2 generator, Oleg & Yuri charged the unit once again with pressurized N_2 from the BPA Nitrogen Purge Unit (#23) to 1 atm (1 kg/cm^2). The last test pressurization to monitor for leakage was on 9/29. *[Objective of the checkout of the BZh, which has been in stowage for almost 2 years, was to check for leakage and good water passage through the feed line inside of the BZh (from ZL1 connector to the buffer tank) and to check the response of the Electronics Unit's micro switches (signaling "Buffer Tank is Empty" & "Buffer Tank is Full". During Elektron operation, the inert gas locked up in the BZh has the purpose to prevent dangerous O_2/H_2 mixing. A leaking BZh cannot be used.]*

As part of handover activities, CDR-18 Fincke used the vacuum cleaner plus other tools to perform the periodic USOS hatch seal inspection (Node-1 Forward, Aft & Starboard, Lab Aft & Forward, Node-2 Aft, Starboard & Port, Airlock, Columbus, Kibo JPM Zenith & Starboard, Kibo JLP Nadir) in support of ACS (Atmospheric Control System) maintenance.

Oleg Kononenko completed the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the DC1-to-Soyuz tunnel, and the FGB-to-Soyuz and FGB-to-Node passageway. *[This is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently six persons, and one of the two Russian SKV air conditioners still off (SKV-1), having run out of service life.]*

Fincke & Lonchakov had their standard PMCs (Private Medical Conferences), via S-band/audio & Ku-band/video, Mike at ~10:15pm EDT, Yuri at ~1:35pm.

Chamitoff & Fincke have their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS- NetMeeting application (which displays the uplinked ground video on an SSC laptop) scheduled today, Greg at ~12:45pm, Mike at ~3:10pm.

VC-15 Richard Garriott, assisted in part by Russian crewmembers, worked on his daily onboard program which today included –

- INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function, collecting wet saliva sample before breakfast);
- SLEEP Actiwatch logging;
- Tagup with advisors (AT) at TsUP via VHF-1;
- TV/phone downlink ("call mother");
- Ham radio session (Austin, TX for Challenger Center);
- PRK Visual Acuity evaluation;
- MUSCLE-G (LBP/Low Back Pain) questionnaire;
- MOP-G (Motion Perception; vestibular adaptation to changes in micro-G);
- Video blogs (e.g., Bacteria, Electrostatic Charge, Action & Reaction Sports, Gyroscopes, Rotational inertia, Energy exchange, How & Why liquids merge & mix, Physiological Factors, Family)
- Earth photography (Europe, Central Asia, Himalayas, night shots, Central America, Space Station movie, Life Onboard);
- Copying data & image files to HDD (Hard Disk Drive) for return.

The E17/18 crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR-18, FE-2), TVIS treadmill (CDR/2.5h, FE-1/2.5h), and RED resistive exercise device (FE-1-18, FE-2).

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

Week 27 Scheduled Main Activities:

- *Mon. (10/20):* MBI-15, JPM outfit, PILLE-MKS, Descent OBT, JEMRMS s/u, TEKh-15, Vozdukh AVK c/o, RBO-3-1, IP-1, BIO-4, PAO, MBI-12.
- *Tue. (10/21):* MO-22, MBI-12, RSP checkout, CMRS checkout, JEMRMS checkout, SVO EDV sampling, ODNT/LBNPO closeouts, RBO-3-1, PAO; Rodnik xfer, PMCs, PFE (FE-2), BIO-2, MO-21, KPT-1 chg., FMK deploy.

- *Wed. (10/22):* RPM skill trng2, BITS-LKT removal, IPD-NH3/GSC/CMS sampling, BIO-12 xfer, CBCS install, BTKh-31/-8 xfers, KPT-3 ops, MO-21, BIO-4, Change of Command, IP-1, PMCs.
- *Thu. (10/23):* SLEEP, IMMUNE, FMK stow, Pld xfers, Hatches closure, Soyuz undock & land; IP-1.
- *Fri. (10/24):* Ham pass, NUTRITION s/u, COL FSL VMU troubleshoot, BLB incubator ECS xchange, BCAT-4.
- *Sat. (10/25):* NUTRITION, Ham pass, WPC, FFQ, VolSci EPO, SAMS PCMCIA check, Node-1 cleanup.
- *Sun. (10/26):* NUTRITION, Station cleaning, PFCs.

ISS Orbit (as of this morning, 7:52am EDT [= epoch]):
Mean altitude -- 352.1 km
Apogee height -- 354.4 km
Perigee height -- 349.9 km
Period -- 91.58 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.000333
Solar Beta Angle -- -59.2 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 58 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56809

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
10/23/08 -- Soyuz TMA-12/16S undock (DC1 nadir, 8:15pm) & land (11:36pm) = 10/24 -- 9:36am Kazakhstan)
11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*
11/15/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/17/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit – *(UNDER REVIEW)*
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.) – *(UNDER REVIEW)*
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)

03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/18/08
Date:	Saturday, October 18, 2008 1:45:38 PM
Attachments:	

ISS On-Orbit Status 10/18/08

All ISS systems continue to function nominally, except those noted previously or below. *Day 5 of joint E17/18 operations. Saturday – but not a rest for CDR Volkov, FE-1 Kononenko, FE-2 Chamitoff, CDR-18 Fincke, FE-1-18 Lonchakov & SFP Garriott.*

The crew's work/sleep cycle remains at the one-hour earlier wake-up time of 1:00am EDT; sleeptime tonight – 4:30pm.

Aboard the station, the E17/18 crew rotation/handover activities continued nominally. *[Volkov, Kononenko, Fincke and Lonchakov had ~3:30 hrs between them for dedicated CDR/CDR & FE/FE handover activities, focusing today on SOZh/ ECLSS (BMP, GANK, CMS Analyzer), SOTR (Thermal Control System), EPS (Electrical Power System), Internal Lights, BVS (Onboard Computer System), as listed in the relevant Handover (RPS) Book sections 10, 12, 13, 17, 18. In addition, there are "generic" handovers where crewmembers are scheduled together to complete various designated standard tasks.]*

CDR Volkov, with Yuri Lonchakov observing, performed the periodic maintenance of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The process will be terminated at ~3:30pm EDT and Bed #2 regeneration performed tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently (last time: 9/29 & 9/30).]*

Sergey Volkov also conducted the (currently daily) visual status check on the running DAKON-M hardware in the second session of the Russian experiment TEKh-15/IZGIB ("Bend"), tagging up with the ground, downlinking data and restarting the data taking afterwards. *[The activity runs till 10/20, requiring visual control of hardware operations three times a day and report to the ground. The first*

IZGIB session, for checkout, was conducted on 9/23. IZGIB has the objective to help update mathematical models of the ISS gravitation environment, using accelerometers of the Russian SBI Onboard Measurement System, the GIVUS high-accuracy angular rate vector gyrometer of the SUDN Motion Control & Navigation System and other accelerometers for unattended measurement of micro-accelerations at science hardware accommodation locations - (1) in operation of onboard equipment having rotating parts (gyrodynes, fans), (2) when establishing and keeping various ISS attitude modes, and (3) when performing crew egresses into space and physical exercises.]

Major science activities in the RS (Russian Segment) by Yuri Lonchakov today focused on work with the biotechnological experiments

- BTKh-14/BIOEMULSION (activation of mixing mode Day 3, closeout ops with Bioreactor #5 and transfer to KRIOGEM-3M, with photography) and
- BIO-4 (installation of Base C and SEN/Xenopus units in KUBIK 3, and ventilating the BIO-4 sample in KUBIK-1). *[The four BIO-4 experiments, developed by scientists from Germany, Belgium, Switzerland, Italy and France, include research in bacterial physiology, immune cell function and developmental biology. Two experiments (BBB/BASE B & BBC/BASE C) study how bacteria cope and adapt in the spaceflight environment, being exposed to parameters such as microgravity, cosmic radiation, space electromagnetism and vibrations. Xenopus studies the development of cane toad tadpoles (Xenopus laevis) in spaceflight. The fourth experiment is ROALD looks at the "ROle of Apoptosis in Lymphocyte Depression". BBB, BBC & SEN will return on Soyuz TMA-12/16S.]*

In support of the Russian KPT-12/EXPERT experiment, Kononenko collected surface samples from inside and around the SM PrK (Transfer Compartment) Tunnel.

The FE-1 also removed yellow tags from equipment that was certified since launch, involving the two ZVENO-B ("Link-B") units installed last August behind SM (Service Module) panel 437. *[Yellow tags, more formally called "uncertified dual ops tags", are used to identify items not certified for ISS Operations (certification and/or paperwork not complete prior to launch); items which have IP (International Partner) segment-specific certification (can be used in one IP segment but should not be used in anther IP segment); items that could pose a safety hazard; and items that are broken or expired. Blank yellow tags are flown so hardware can be tagged on-orbit as necessary.]*

Working in JAXA's Kibo JPM (JEM Pressurized Module), Chamitoff powered up the PCS (Portable Computer System) laptop and performed a checkout of the external forward TV camera to verify its function and controllability for the upcoming

JEMRMS (Robotic Manipulator System) checkout.

On the JPM's IPU VRU (Image Processing Unit/Video Recording Unit), the FE-2 removed & replaced a number of recording disks (#1035, #1036, #1037, #1038, #1039).

Additionally, Gregory had ~1hr. for cleaning up payload items in Kibo, i.e., consolidating LSE (Laboratory Support Equipment) and FPEF (Fluid Physics Experiment Facility) tools in their CTBs (Cargo Transfer Bags) and relocating the CTBs for return to the ground on ULF-2.

Also in the Japanese segment, CDR-18 Fincke took documentary photography for subsequent downlink to Tsukuba from an SSC (Station Support Computer). *[The shots were to show the clearance between the ZSR (Zero-G Stowage Rack) and JLP (JEM Pressurized Logistics Segment) shell and N-Brace, plus the Saibo Rack CO_2 umbilical connection and the manual valve GCO_2 vent.]*

In the Soyuz TMA-13 spacecraft, Yuri Lonchakov performed troubleshooting on the V1 fan of the ventilation system in the Descent Module, supported by ground monitoring on DO4 (Daily Orbit 4).

In preparation for tomorrow's SSRMS (Space Station Remote Manipulator System) operations, i.e., maneuvering to and grapple MBS PDGF-1 (Mobile Base System/ Power & Data Grapple Fixture 1), Greg Chamitoff set up the Robotics video camera connection by hooking up the UOP DCP (Utility Outlet Panel/Display & Control Panel) power bypass cable for both the Lab & Cupola RWS (Robotics Workstations), followed by a 30-min. review of newly uplinked POC DOUG (Portable Onboard Computers/Dynamic Onboard Ubiquitous Graphics) software for the SSRMS activities.

Afterwards, Gregory cleaned out Node-2 of stowage items to make room for setting up and checking out the CBCS (Centerline Berthing Camera System) preparatory to the docking of MPLM (Multi-Purpose Logistics Module) "Leonardo" on ULF-2.

Kononenko & Lonchakov conducted an inspection and checkout of PU SOA (Air Scrubbing System Control Panel) cables behind SM panel 425. *[Panel 425 covers the flexible metal H_2 hoses from Elektron between the RPD pressure differential regulator (equalization unit) and the ZLVK-2 hydrogen vent valve toward the BMP micropurification unit inlet valve.]*

Yuri Lonchakov performed the monthly radiation data checkup for accumulated flux & dose rate data with the Matryoshka-R radiation payload (RBO-3-2) and its LULIN-

5 electronics box, replacing its data storage card with a new one.

Chamitoff worked on the BCAT-4 experiment which on 10/10 had encountered a problem with the SSC-12 laptop running the automated picture-taking EarthKAM software. *[Setting up to continue BCAT-4 operations tomorrow, Greg replaced the SSC-12 with another laptop (SSCs-4 & 6 being also not good), then turned on the laptop and camera, and took some Sample 3 photos in order to make sure that the system is working properly.]*

The FE-2 also repaired a failed PCS (Portable Computer System) laptop in the US Airlock by transferring its hard disk drive (vers. R11) to another laptop shell, later reporting that the PC was working OK again.

Greg filled out the regular FFQ (Food Frequency Questionnaire), his 16th, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

Mike Fincke performed the monthly CEVIS (cycle ergometer) maintenance, and Yuri Lonchakov got checked out on TVIS treadmill IFM (Inflight Maintenance) procedures.

Sergey Volkov conducted the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the DC1-to-Soyuz tunnel, and the FGB-to-Soyuz and FGB-to-Node passageway. *[This is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently six persons, and one of the two Russian SKV air conditioners still off (SKV-1), having run out of service life.]*

Oleg & Yuri took readings with the Russian AOK GANK-4M Real-Time Harmful Contaminant Gas Analyzer system and calibrated the unit.

Servicing the US OGS (Oxygen Generation System), Mike Fincke & Greg Chamitoff removed the WDS (Water Delivery System) to provide access to the OGS for the regular O_2 purge of the H_2 sensor, after demating the O_2 outlet QD (Quick Disconnect). The WDS was then re-installed on the OGS rack front.

VC-15 Richard Garriott, assisted in part by Russian crewmembers, worked on his daily onboard program which today included –

- SLEEP Actiwatch logging;
- Tagup with consultants (AT) at TsUP via VHF-1;
- Ham radio session (Austin, TX for Challenger Center);
- PRK Visual Acuity evaluation;
- MUSCLE-G (LBP/Low Back Pain) questionnaire;
- MOP-G (Motion Perception; vestibular adaptation to changes in micro-G);
- Video blogs (e.g., Earth Science Challenges 1-6, Time in Space, Tabula Rasa, DEV Team & players, commercial Seiko questionnaire, et al.);
- Earth photography (mid-US, Seattle, Southern Canada); and
- Copying data & image files to HDD (Hard Disk Drive) for return.

Richard and the three Russian crewmembers had two hours set aside for scheduled commemorative (Russian: "symbolic") activities, a standard tradition for visiting guests and departing expedition crewmembers. *[The crew members signed and stamped a book by Y. V. Kondratiuk ("Conquering Interplanetary Space"), pennants of TsAGI (Central Aerohydrodynamic Institute), the Communard Association and the Chemical Engineering Design Office (with A.M. Isaiev's portrait), Russian post philatelic items (envelopes), and envelopes for the 16S crew commemorative kit.]*

Garriott, Fincke & Lonchakov had their standard PMCs (Private Medical Conferences), via S-band/audio & Ku-band/video, Richard at ~4:30am EDT, Mike at ~1:05pm, Yuri at ~1:20pm.

Gregory & Michael had again time set aside on their schedule for pre-packing hardware to be returned on STS-126/ULF-2.

The E17 crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR/2.5h, FE-1/2.5h), and RED resistive exercise device (FE-2). Also, CDR-18 Fincke performed his second onboard exercise on the RED for one hour.

Afterwards, Greg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Weekly Science Update *(Expedition Seventeen -- Week 26)*

3-D SPACE: In progress.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Close-out activities for Inc 17-ALTCRISS were performed on 10/14.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3/4 (Binary Colloidal Alloy Test 3/4): "Greg. thank you for all your work to attempt to get a functional laptop and for requesting to try BCAT-4 again."

BIO-4: With 17S, a package of 3 Biology experiments were launched (i.e. ROALD, XENOPUS, BASE-B/-C) using the KUBIK incubators. On 10/14, KUBIK 1 & 2 were activated and temperatures were set: +21deg C for KUBIK-1 (to support XENOPUS) and +37deg C for KUBIK-2 (to support ROALD). XENOPUS experiment containers were installed upon transfer from Soyuz and activated on 10/14/11:20am EDT. ROALD experiment containers were installed, and the centrifuge was activated around 10/14/11:33am. The ROALD experiment is controlled by an automated timeline which commands the different fixation points in time. Containers with fixed samples are then transferred to MELFI. The first insertion into MELFI was performed around 10/14/2:40pm, and the second insertion was performed some hours later around 10/14/4:15pm. The next day, the third transfer was also performed as planned and samples were inserted into MELFI around 10/15/2:16pm. The fourth and final transfer for ROALD was planned for 10/16/2:00pm (pending confirmation).

For the XENOPUS experiment, the crew performs a daily ventilation of the KUBIK. The containers for the BASE-B/-C experiment were kept in Soyuz to allow for stable temperature conditions. The experiment will start on GMT292, with KUBIK-3 setup on GMT291.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-2/CGBA-5 (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus 5): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): Due to safety concerns identified for the PLEGPAY instrument (when operated in Plasma Discharge mode), the entire EuTEF platform was put in survival mode on 9/1 at around 11:00am EDT (just prior to 29P undocking). Since then, the EuTEF power feeder#1 has been de-activated and no science acquisition is possible. Request has been approved for intermittent activation for 3 of the 9 EUTEF payloads. EuTEF platform power feeder #1 has been re-activated for 8-hrs periods on 10/10, 10/12, and 10/15 (10/14 was skipped because of 17S docking). This activation protocol will continue every other day until safety issues are solved with the PLEGPAY instrument. This only mitigates the science loss for the EXPOSE, DOSTEL and MEDET instruments. The situation implies significant loss of science return for all EUTEF payloads.

FSL (Fluid Science Laboratory): FSL is nominal.

GEOFLOW: In progress.

HDTV System Test DL (JAXA): JAXA tried to downlink the missed images but failed. So, a tape was added which was on the return manifest for ULF-2.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): In progress.

Marangoni Experiment for ISS (JAXA Fluid Physics Experiment Facility): The

Marangoni Experiment has been completed, with the exception of the HDD (Hard Disk Drive) exchange. The PI team decided not to conduct the experiment further, because of the lack of the silicon oil buffer. Although the liquid bridge occurred, the PI is very satisfied with the results.

Micro-G Clay (JAXA EPO): Complete.

MISSE (Materials ISS Experiment): Ongoing.

Moon Photography from ISS (JAXA EPO): Complete.

MOP (Motion Perception in Zero-G): Daily MOP questionnaires are filled in by the SFP (Space Flight Participant).

MSG-SAME (Microgravity Science Glovebox): Complete.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MUSCLE-G (LBP/Low Back Pain): Daily MUSCLE questionnaires are filled in by the SFP.

NOA-1/-2 (Nitric Oxide Analyzer, ESA): NOA return items have been pre-packed for 16S return.

NUTRITION w/REPOSITORY: In progress.

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PCRF (Protein Crystallization Research Facility) Reconfiguration (JAXA): Complete.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): Complete.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): "Greg, thanks for completing your Sleep logging this week. The Sleep PI is receiving your data, and we will work to correct the Sleep Log File save path with a service pack update and try to schedule another week to make up for the week that was deleted. We are currently working on scheduling a download 3 and initialize 2 activity after undocking on 10/23 for the Actiwatch data."

SOLAR (Solar Monitoring Observatory): The last Sun visibility window ended on 10/4. The instruments operated nominally, with the exception of SOLACES which encountered a synchronization problem for its two micro-controllers units.

SOLO (Sodium Loading in Microgravity): Currently in idle mode, as no sun visibility. Performed only troubleshooting for SOLACES on problem of synchronization for its two micro-controllers units

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): Reserve.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): Completed.

CEO (Crew Earth Observations): Through 10/16 the ground has received a total of 8,491 frames of CEO images for review and cataloging. Photos with times corresponding to the uplinked CEO target request times are reviewed first and since the last report included: Hurricane Norbert, Eastern Pacific (excellent imagery but received only yesterday). "Greg, your excellent, sun glint-enhanced view of Coronado Island in Mexico's Gulf of California will be published on NASA/GSFC's Earth Observatory website this weekend. Your image nicely documents the topographic features of this uninhabited island and hints of its diverse marine environment. Nice catch!"

CEO (Crew Earth Observations) photo targets uplinked for today were Meili Glacier, China *(Meili Mt. with its glacier rises above 22,000 feet and is the center of a diversity hotspot for plants and endangered animals [snow leopard, clouded leopard, Asiatic black bear, and red panda]. The snow-covered mountain ranges run parallel separated by major rivers in semiarid gorges. Meili Mt. lies on the second major range right of track),* and Two Hearted River Forest Reserve, Upper

Peninsula, MI *(this Reserve will be managed by the Nature Conservancy for sustainable forestry. Imagery for longer term monitoring was requested. Looking just right of track, a short way inland from the shore of Lake Superior).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

Week 26 Scheduled Main Activities:

- *Sun. (10/19):* ISS-18 expmts.; VC15 Prgm.; Handovers ISS-18; BMP ch.2 regen.; JEMRMS DOUG review ; JEMRMS activities/checkout ; MBI-15 NEURO; O-OHA assess.; IP-1 check; Elektron BZh check.

ISS Orbit (as of this morning, 7:26am EDT [= epoch]):
Mean altitude -- 352.2 km
Apogee height -- 354.5 km
Perigee height -- 349.9 km
Period -- 91.58 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0003346
Solar Beta Angle -- -60.6 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 30 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56793

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
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11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*
11/15/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/17/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit – *(UNDER REVIEW)*
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.) – *(UNDER REVIEW)*
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking

02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/17/08
Date:	Friday, October 17, 2008 12:59:53 PM
Attachments:	

ISS On-Orbit Status 10/17/08

All ISS systems continue to function nominally, except those noted previously or below. *Day 4 of joint E17/18 operations.*

The crew's work/sleep cycle remains at the one-hour earlier wake-up time of 1:00am EDT; sleeptime tonight – 4:30pm.

Aboard the station, the E17/18 crew rotation/handover activities continued nominally. *[Volkov, Kononenko, Fincke and Lonchakov had ~4:45 hrs between them for dedicated CDR/CDR & FE/FE handover activities, focusing today on SOZh/ECLSS (CMS Analyzer), TORU, EVA, IVA & EVA Tools, Hatches, Windows, STA Kits, Progress & Progress Transfers status, as listed in the relevant Handover (RPS) Book sections 14, 15, 16, 23. In addition, there are "generic" handovers where crewmembers are scheduled together to complete various designated standard tasks.]*

After wakeup and before breakfast, FE-2 Chamitoff & SFP (Space Flight Participant) Garriott downloaded the daily SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data from their Actiwatches to the HRF-1 (Human Research Facility 1) laptop. Richard is participating in the SLEEP experiment for NASA. *[To monitor the crewmember's sleep/wake patterns and light exposure, crewmembers wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

CDR Volkov performed the (currently daily) visual status check on the running DAKON-M hardware in the second session of the Russian experiment TEKh-15/ IZGIB ("Bend"), tagging up with the ground, downlinking data and restarting the data taking afterwards. *[The activity runs till 10/19, requiring visual control of hardware operations three times a day and report to the ground. The first IZGIB*

session, for checkout, was conducted on 9/23. IZGIB has the objective to help update mathematical models of the ISS gravitation environment, using accelerometers of the Russian SBI Onboard Measurement System, the GIVUS high-accuracy angular rate vector gyrometer of the SUDN Motion Control & Navigation System and other accelerometers for unattended measurement of micro-accelerations at science hardware accommodation locations - (1) in operation of onboard equipment having rotating parts (gyrodynes, fans), (2) when establishing and keeping various ISS attitude modes, and (3) when performing crew egresses into space and physical exercises.]

Volkov & Kononenko had 2 hrs set aside to perform the periodic Russian SPOPT (Fire Detection & Suppression System) maintenance, today in the FGB, by dismantling its IDZ-2 smoke detectors, cleaning their ionizing needles and then reinstalling the sensors. *[Part of the job is to inspect surrounding areas behind panels and to clean those surfaces with microbial growth wipes.]*

Major science activities in the RS (Russian Segment) by Yuri Lonchakov today focused on work with the thermostat-controlled coolers KUBIK-2 (preparing & copying data from it) and KUBIK-3 (installing the KUB incubator) plus the biotechnological experiments BIOEMULSION (activation of mixing mode Day 2) and BIO-4 (ventilation in KUBIK-1).

Sergey & Oleg conducted their fourth preliminary training session with the Russian "Chibis" LBNP suit (lower body negative pressure; Russian: ODNT), ramping up to get them ready for returning to gravity on 10/23. Assisting each other in turn as CMO (Crew Medical Officer), the subjects were supported in their two one-hour sessions by ground specialist tagup via VHF at 5:35am (DO4) & 7:10am EDT (DO5). *[The assessment uses the Gamma-1 ECG equipment with biomed harness, skin electrodes and a blood pressure and rheoplethysmograph cuff wired to the cycle ergometer's instrumentation panels. The Chibis ODNT provides gravity-simulating stress to the body's cardiovascular/circulatory system for evaluation of Volkov's and Kononenko's orthostatic tolerance (e.g., the Gauer-Henry reflex) after several months in zero-G. The preparatory training generally consists of first imbibing 150-200 milliliters of water or juice, followed by two cycles of a sequence of progressive regimes of reduced ("negative") pressure, set today at -25, -30, -35 and -40 mm Hg (Torr) for five min. each while shifting from foot to foot at 10-12 steps per minute, wearing a sphygmomanometer to measure blood pressure. The body's circulatory system interprets the pressure differential between upper and lower body as a gravity-like force pulling the blood (and other liquids) down. Chibis data and biomed cardiovascular readings are recorded. The Chibis suit (not to be confused with the Russian "Pinguin" suit for spring-loaded body compression, or the "Kentavr" anti-g suit worn during reentry) is similar to the U.S. LBNP facility (not a suit) used for the first time on Skylab in 1973/74, although it appears to accomplish*

its purpose more quickly.]

FE-1-18 Lonchakov worked in the Soyuz TMA-13/17S Descent Module, dismantling the two "Klest" (KL-152) TV cameras and their light units for return to the ground on 16S for reuse, temporarily stowing them in the SM (Service Module).

Oleg Kononenko conducted the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the DC1-to-Soyuz tunnel, and the FGB-to-Soyuz and FGB-to-Node passageway. *[This is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently six persons, and one of the two Russian SKV air conditioners still off (SKV-1), having run out of service life.]*

With the JAXA Marangoni Surface experimentation in the FPEF (Fluid Physics Experiment Facility) having ended, FE-2 Chamitoff spent 10 min. in the Kibo JPM (JEM Pressurized Module) to turn off the MMA (Microgravity Measurement Apparatus) and its laptop (MLT), then powered down the MMA's NCU/RSU (Network Control Unit/Remote Sensor Unit) set from the Ryutai rack's UDC (Utility DC-to-DC Converter). *[SSIPC (Space Station Integration & Promotion Center) at Tsukuba/Japan has been conducting the Marangoni convection research basically only during crew sleep (for quiescence). The first series of the Marangoni experiment is now complete, and researchers uplinked their thanks to the crew, saying that they "were excited by the results".]*

In the US Lab, Gregory reconfigured the ITCS (Internal Thermal Control System) LAB1O4 RFCA (Rack Flow Control Assembly) from LTL (Low Temperature Loop) to MTL (Moderate Temperature Loop) operation, as required for upcoming EXPR-6 activities.

Kononenko & Lonchakov, as part of the handover program (RPS), collected the periodic readings of potentially harmful atmospheric contaminants in the SM (Service Module), using the CMS (Countermeasure System), a component of the SKDS GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, today using preprogrammed microchips to measure for o-Xylol (1,2-Dimethylbenzol, C_8H_{10}), Methyl-Mercaptan (Methanethiol, CH_4S), and Sulphur Dioxide (SO_2).

The FE-2 took measurements for the regular atmospheric status check for $ppCO_2$ (Carbon Dioxide partial pressure) in the Lab, SM at panel 449 and COL (Columbus Orbital Laboratory) plus battery ticks, using the hand-held CDMK (CO_2 Monitoring Kit, #1002). The unit was then deactivated and returned to its stowage location (LAB1S2). *[Purpose of the 5-min activity is to trend with MCA (Major Constituents*

Analyzer), i.e., to correlate the hand-held readings with MCA measurements. The results are usually logged in the OSTPV (Onboard Short Term Plan Viewer) and are immediately available to the ground.]

Working on the MATRYOSHKA-R (RBO-3-2) radiation instrumentation in the SM (panel 326), Yuri activated the AST Spectrometer for taking radiation measurements and storing the data on an inserted PCMCIA (Portable Computer Memory Card International Adapter) memory card (ALC-954). *[RBO-3-2 is using the ESA/RSC-Energia experiment ALTCRISS (ALC/Alteino Long Term monitoring of Cosmic Rays on the ISS) with its Spectrometer (AST) and ALC equipment, which is periodically moved around and now located again in the SM.]*

VC-15 Richard Garriott, assisted in part by Russian crewmembers, worked on his daily onboard program which today included –

- SLEEP Actiwatch logging;
- INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function, collecting wet saliva sample before breakfast);
- Telephone talk to AT thru TsUP/Moscow via USB1;
- Tagup with consultants at TsUP via VHF-1;
- SSTV (Slow-Scan TV) ham radio session with Star City (Shchelkovo) via RSK2 laptop and MAREX-NA ISS SpaceCam1;
- 3 Ham radio sessions (Budbrooke Primary School, Warwick, England plus 2 with Austin, TX for VC-15 program & Challenger Center);
- DHL-G experiment for commercial German firm DHL (demo of Law of Preservation of Energy in micro-G using motion of two objects), along with still & video documentation);
- PRK Visual Acuity evaluation;
- MUSCLE-G (LBP/Low Back Pain) questionnaire;
- MOP-G (Motion Perception; vestibular adaptation to changes in micro-G);
- Video blogs (e.g., Family & Family Jewelry, Magnetism, Fluid Behavior, Conservation of Momentum, Ice Melting, et al.);
- Earth photography (Eastern US, Southern CA, mid-US); and
- Copying data & image files to HDD (Hard Disk Drive) for return.

E18 crewmembers Lonchakov & Fincke had several time segments reserved to familiarize themselves with physical exercise and the workout equipment (RED, TVIS treadmill maintenance, TVIS memory card formatting).

Volkov performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Sergey also conducted the daily IMS (Inventory Management System) maintenance, updating/editing the standard IMS “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Fincke & Lonchakov had their standard PMCs (Private Medical Conferences), via S-band/audio & Ku-band/video, Mike at ~10:10am EDT, Yuri at ~12:55pm.

Gregory & Michael had again time (~2.5 hrs) set aside on their schedule for pre-packing hardware to be returned on STS-126/ULF-2.

The E17 crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), and RED resistive exercise device (FE-2). Volkov & Kononenko had part of their exercise regimen accounted for by their fourth Chibis session, and CDR-18 Fincke performed his first onboard exercise on the RED for one hour.

Afterwards, Greg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~3:15am EDT, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~9:30am, Chamitoff held a teleconference with Astronaut Sandra Magnus, the new FE-2 coming up on STS-126/ULF-2 to replace him.

At ~2:10pm, the ISS crew is scheduled for their regular weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC]*.

At ~3:45pm, the FE-2 is also scheduled for a CDE (Crew Discretionary Event) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

WRM Update: An updated WRM (Water Recovery Management) “cue card” was uplinked overnight for the crew’s reference, updated with yesterday’s water audit. *[The new card (17-1016D) lists 27 CWCs (~929.4 L total) for the four types of water identified on board: technical water (241.2 L, for Elektron electrolysis),*

potable water (627.6 L, incl. 174.6 L currently on hold), condensate water (21.4 L), waste/EMU dump and other (39.20 L). Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

Conjunctions: Two conjunctions with orbital debris continue to be closely monitored by MCC-H specialists, both for tomorrow, Saturday (10/18): Object #33326 (from a Chinese CZ-2C rocket) with a TCA (Time of Closest Approach) at 9:55am EDT and a predicted overall miss distance (R) of 10.23 km, and Object #87985 (unknown) with TCA of 4:44pm and R = 86.5km (to be dropped). If a DAM (Debris Avoidance Maneuver) becomes advisable for #33326, it would best be performed tomorrow morning at 7:48am. If it is performed, Soyuz 16S landing time would occur approximately 2 min. later than currently planned, and the currently-planned reboost on 10/29 would be cancelled.

CEO (Crew Earth Observations) photo targets uplinked for today were **Japan Islands** *(due to the current crew sleep shifting Greg had a nice opportunity to not only see Japan but to acquire a panoramic view from the northern islands to the south),* **West Hawk Impact Crater** *(looking right from track, West Hawk crater is a circular lake. This 4.5 km-diameter crater was formed 350 million years ago, and despite several episodes of glacial erosion in the last 2 million years, is still evident in the landscape. Greg may have had patchy clouds in the area),* and **Hurricane Omar, Atlantic Ocean** *(Greg should have been able to see Hurricane Omar south and right of ISS track. Omar is forecasted to have wind speeds of 110 kt, making it a minimal Category 3 storm. Trying to capture as much of the hurricane in a single frame as possible)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

Week 26 Scheduled Main Activities:

- *Sat. (10/18):* ISS-18 expmts.; VC15 Prgm.; BMP ch.1 regen.; GANK sampling; IP-1 check; FFQ; Handovers ISS-18; Symbolic Activity; OGS deact.; DOUG review for JEMRMS checkout.
- *Sun. (10/19):* ISS-18 expmts.; VC15 Prgm.; Handovers ISS-18; BMP ch.2 regen.; JEMRMS DOUG review ; JEMRMS activities/checkout ; MBI-15 NEURO; O-OHA assess.; IP-1 check; Elektron BZh check.

ISS Orbit (as of this morning, 8:34am EDT [= epoch]):
Mean altitude -- 352.2 km
Apogee height -- 354.6 km

Perigee height -- 349.8 km
Period -- 91.58 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0003546
Solar Beta Angle -- -61.1 deg (magnitude peaking)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 70 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56778

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
10/23/08 -- Soyuz TMA-12/16S undock (DC1 nadir, 8:15pm) & land (11:36pm) = 10/24 -- 9:36am Kazakhstan)
11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*
11/14/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/16/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.) – *UNDER REVIEW*
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at

http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/16/08
Date:	Thursday, October 16, 2008 1:11:24 PM
Attachments:	

ISS On-Orbit Status 10/16/08

All ISS systems continue to function nominally, except those noted previously or below. *Day 3 of joint E17/18 operations.*

The crew's work/sleep cycle returned to the one-hour earlier wake-up time of 1:00am EDT; sleeptime tonight remains at 4:30pm.

Aboard ISS, the E17/18 crew rotation/handover activities continued nominally. *[Volkov, Kononenko, Fincke and Lonchakov had ~4 hrs between them for dedicated CDR/CDR & FE/FE handover activities, focusing today on Video, Audio, Prox Ops systems, Communications System, STTS (Telephone/Telegraph), ECLSS, Iridium-9505A (Motorola) satphone, recommendations on working with Radiograms, ODFs (Operations Data Files) & the IMS (Inventory Management System), and the relevant RBS power outlets 2, 4, 7 8, 9 10 (English: UOP/ Utility Outlet Panel). In addition, there are "generic" handovers where crewmembers are scheduled together to complete various designated standard tasks.]*

After wakeup and before breakfast, FE-2 Chamitoff & SFP (Space Flight Participant) Garriott downloaded the daily SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data from their Actiwatches to the HRF-1 (Human Research Facility 1) laptop. Garriott is participating in the SLEEP experiment for NASA. *[To monitor the crewmember's sleep/wake patterns and light exposure, crewmembers wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

CDR Volkov performed the (currently daily) visual status check on the running DAKON-M hardware in the second session of the Russian experiment TEKh-15/ IZGIB ("Bend"), tagging up with the ground, downlinking data and restarting the data taking afterwards. *[The activity runs till 10/19, requiring visual control of hardware operations three times a day and report to the ground. The first IZGIB*

session, for checkout, was conducted on 9/23. IZGIB has the objective to help update mathematical models of the ISS gravitation environment, using accelerometers of the Russian SBI Onboard Measurement System, the GIVUS high-accuracy angular rate vector gyrometer of the SUDN Motion Control & Navigation System and other accelerometers for unattended measurement of micro-accelerations at science hardware accommodation locations - (1) in operation of onboard equipment having rotating parts (gyrodynes, fans), (2) when establishing and keeping various ISS attitude modes, and (3) when performing crew egresses into space and physical exercises.]

FE-1 Kononenko used the Russian MBI-21 PNEVMOKARD experiment hardware and conducted his fifth session, which disallows moving or talking during data recording. Volkov had his fifth session yesterday. The experiment is controlled from the RSE-med A31p laptop, equipped with new software, and uses the TENZOPLUS sphygmomanometer to measure arterial blood pressure. *[PNEVMOKARD (Pneumocard) attempts to obtain new scientific information to refine the understanding about the mechanisms used by the cardiorespiratory system and the whole body organism to spaceflight conditions. By recording (on PCMCIA cards) the crewmember's electrocardiogram, impedance cardiogram, low-frequency phonocardiogram (seismocardiogram), pneumotachogram (using nose temperature sensors), and finger photoplethismogram, the experiment supports integrated studies of (1) the cardiovascular system and its adaptation mechanisms in various phases of a long-duration mission, (2) the synchronization of heart activity and breathing factors, as well as the cardiorespiratory system control processes based on the variability rate of physiological parameters, and (3) the interconnection between the cardiorespiratory system during a long-duration mission and the tolerance of orthostatic & physical activities at the beginning of readaptation for predicting possible reactions of the crewmembers organism during the their return to ground.]*

FE-2 Chamitoff conducted the monthly 30-min PEP (Fire Detection & Suppression/ Portable Emergency Provisions) safety inspection/audit in the ISS modules. *[The IMS-supported inspection involves verification that PFEs (Portable Fire Extinguishers), PBAs (Portable Breathing Apparatus), QDMAs (Quick-Don Mask Assemblies) and EHTKs (Extension Hose/Tee Kits) are free of damage to ensure their functionality, and to track shelf life/life cycles on the hardware.]*

Chamitoff and CDR-18 Fincke conducted their first standard 30-min Shuttle RPM (R-bar Pitch Maneuver) skill training, using the NIKON D2Xs digital still camera with 400 & 800mm (by teleconverter) lenses at SM (Service Module) windows 6, 7 & 8 (facing in flight direction) to take CEO (Crew Earth Observations) target imagery with manual focusing. The practice run involved mapping of ground features with images having 40-50% overlap and about 20 images in each sequence.

Afterwards, the obtained OBT (onboard training) images were downlinked by Gregory to the ground for analysis (~3:55am). *[The RPM drill prepares crewmembers for the bottom-side mapping of the Orbiter at the arrival of the Shuttle (STS-126/Endeavour/ULF2 on 11/16. During the RPM at ~600 ft from the station, the "shooters" have only ~90 seconds for taking high-resolution digital photographs of all tile areas and door seals on Discovery, to be downlinked for launch debris assessment. Thus, time available for the shooting will be very limited, requiring great coordination between the two headset-equipped photographers and the Shuttle pilot.]*

Working on the MATRYOSHKA-R (RBO-3-2) radiation instrumentation in the SM (panel 326), Yuri Lonchakov conducted a health check on the new setup and downlinked the first data from the ALC-954 PCMCIA (Portable Computer Memory Card International Adapter) memory card via the RSK1 laptop. The AST Spectrometer afterwards remained off. *[RBO-3-2 is using the ESA/RSC-Energia experiment ALTCRISS (ALC/Alteino Long Term monitoring of Cosmic Rays on the ISS) with its Spectrometer (AST) and ALC equipment, which is periodically moved around and now located again in the SM.]*

Major science activities in the RS by Yuri Lonchakov today focused on the biotechnological experiment BIOEMULSION, ARIL, RECOMB-K and BIO-4. *[BIOEMULSION (BTKh-14): activation of mixing mode Day 1, photography during mixing ops; retrieving BTKh-14 Bioreactor #02, ARIL tubes & Recomb-K hardware from thermostat-controlled container KRIOGEM-3M (Cryogem-3M), resetting thermostat temperature to +4 degC and re-inserting the previous payloads. BIO-4: fourth relocation of RLD containers to KUBIK-2 and then to MELFI (Minus-Eighty Laboratory Freezer for ISS).]*

The FE-2 completed the weekly 10-min. CWC (Contingency Water Container) inventory as part of on-going WRM (Water Recovery & Management) assessment of onboard water supplies. Updated "cue cards" based on the crew's water calldowns are sent up every other week. *[The new card (17-1016C), to be updated with today's data, lists 28 CWCs (~911.2 L total) for the four types of water identified on board: technical water (263.2 L, for Elektron electrolysis, except for 22.2 L off-limit because of* Wautersia *bacteria), potable water (627.6 L, incl. 174.6 L currently on hold), condensate water (3.4 L), waste/EMU dump and other (17 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

Volkov performed the regular transfer of US condensate to the Russian water supply system (SVO-ZV) by taking the filled CWC (Contingency Water Container) #1094 to the RS (Russian Segment) and transferring the water to two EDV containers via the BP transfer pump. One of the EDVs was then connected to the

SVO-ZV, replacing the emptied container.

For Sergey, with Yuri for handover, it was time again for recharging the Motorola Iridium-9505A satellite phone brought up on Soyuz 16S, a monthly routine job and his sixth time. *[After retrieving it from its location in the TMA-12/16S descent module (BO), Sergey and Yuri initiated the recharge of its lithium-ion battery, monitoring the process every 10-15 minutes as it took place. Upon completion at ~10:15am, the phone was returned inside its SSSP Iridium kit and stowed back in the BO's operational data files (ODF) container. The satphone accompanies returning ISS crews on Soyuz reentry & landing for contingency communications with SAR (Search-and-Rescue) personnel after touchdown (e.g., after an "undershoot" ballistic reentry, as happened during the recent 15S return). The Russian-developed procedure for the monthly recharging has been approved jointly by safety officials. During the procedure, the phone is left in its fire-protective fluoroplastic bag with open flap. The Iridium 9505A satphone uses the Iridium constellation of low-Earth orbit satellites to relay the landed Soyuz capsule's GPS (Global Positioning System) coordinates to helicopter-borne recovery crews. The older Iridium-9505 phones were first put onboard Soyuz in August 2003. The newer 9505A phone, currently in use, delivers 30 hours of standby time and three hours of talk, up from 20 and two hours, respectively, on the older units.]*

Oleg Kononenko conducted the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the DC1-to-Soyuz tunnel, and the FGB-to-Soyuz and FGB-to-Node passageway. *[This is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently six persons, and one of the two Russian SKV air conditioners still off (SKV-1), having run out of service life.]*

Greg Chamitoff performed the periodic battery replacement on the prime CSA-CP (Compound Specific Analyzer-Combustion Products) instrument.

VC-15 Richard Garriott, assisted in part by Russian crewmembers, worked on his daily onboard program which today included –

- SLEEP Actiwatch logging;
- Telephone talk to AT via USB1;
- Tagup with consultants at TsUP-Moscow via VHF-1;
- 2 Ham radio sessions with Austin, TX (VC-15 program & Challenger Center);
- TV conference with family at TsUP (Owen Garriott);
- PICTURE experiment (creation of a painting in zero-G with free-floating paint drops, along with still & video documentation);
- PRK Visual Acuity evaluation;
- MUSCLE-G (LBP/Low Back Pain) questionnaire;
- MOP-G (Motion Perception; vestibular adaptation to changes in micro-G);

- Video blogs (e.g., SEIKO watch, UK Challenge, Art topics & Art Show in Space);
- Earth photography (Phoenix and across mid0-US); and
- Copying files to HDD (Hard Disk Drive) for return.

The CDR-17 performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Sergey also conducted the daily IMS maintenance, updating/editing the standard IMS "delta file" including stowage locations, for the regular weekly automated export/ import to its three databases on the ground (Houston, Moscow, Baikonur).

Volkov & Lonchakov spent ~30 min in the two Soyuz spacecraft to conduct the regular multi-element communications test between Soyuz TMA-12, the SM and Soyuz TMA-13. *[Test objectives are to check hard-line comm mode (MBS) & S-band link, Soyuz VHF-2 with S-band & SM VHF-1 in relay mode, Soyuz-to-Soyuz VHF-2 in simplex mode with S-band & SM VHF-1, and to perform some multielement communications procedures training.]*

As part of handover activities, Yuri Lonchakov spent ~30 min on a familiarization review of the onboard physical exercise equipment.

Greg & Mike had another ~3.5 hrs set aside on their timeline for pre-packing hardware to be returned on STS-126/ULF-2.

Lonchakov & Fincke performed their standard PMCs (Private Medical Conferences), via S-band/audio & Ku-band/video, Yuri at ~11:20am, Mike at ~1:15pm.

The E17 crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR/2.5h, FE-1/2.5h), and RED resistive exercise device (FE-2).

Later, Greg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~12:25pm, Mike Fincke and Greg Chamitoff participated in two PAO TV interview

events, one with CBS News (Bill Harwood, Peter King), the other with ABC News (Gina Sunseri).

OGS Update: After yesterday's successful activation of the US OGS (Oxygen Generation System) with the WDS (Water Delivery System) as part of the nominal 90-day procedure, the OGS ran nominally until it was turned off again last night. O_2 is being provided by the Elektron in the RS.

Conjunctions: Two conjunctions with orbital debris are being closely monitored by MCC-H specialists, both for 10/18 (Saturday): Object #33326 (from a Chinese CZ-2C rocket) with a TCA (Time of Closest Approach) at 9:55am EDT and a predicted overall miss distance (R) of 4.87km, and Object #87985 (unknown) with TCA of 4:44pm and R = 7.544km.

CEO (Crew Earth Observations) photo target uplinked for today was **Aral Sea, Kazakhstan, Uzbekistan** *(Dynamic Event: Aral Sea. The Aral Sea is one of CEO's long-term monitoring sites. Once the fourth largest inland sea, Aral Sea lake levels have been steadily declining since the 1960's. The reason for the decline is that the Amu Darya and the Syr Dara rivers that feed the Aral were diverted by the former Soviet Union for irrigation projects. By 2004 the Aral had shrunk to 25% of its original surface area. Context views of the Aral Sea were requested).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

Week 26 Scheduled Main Activities:

- *Fri. (10/17):* ISS-18 expmts.; VC15 Prgm.; PAO; GOGU tagup; ULF-2 prepacking; Handovers ISS-18; ODNT/LBNP OBT; IDZ-2 smoke detector mntn.; CMS sampling; IP-1 check.
- *Sat. (10/18):* ISS-18 expmts.; VC15 Prgm.; BMP ch.1 regen.; GANK sampling; IP-1 check; FFQ; Handovers ISS-18; Symbolic Activity; OGS deact.; DOUG review for JEMRMS checkout.
- *Sun. (10/19):* ISS-18 expmts.; VC15 Prgm.; Handovers ISS-18; BMP ch.2 regen.; JEMRMS DOUG review ; JEMRMS activities/checkout ; MBI-15 NEURO; O-OHA assess.; IP-1 check; Elektron BZh check.

ISS Orbit (as of this morning, 8:07am EDT [= epoch]):
Mean altitude -- 352.3 km
Apogee height -- 354.6 km
Perigee height -- 350.0 km

Period -- 91.58 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0003459
Solar Beta Angle -- -60.5 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 85 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56762

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
10/23/08 -- Soyuz TMA-12/16S undock (DC1 nadir, 8:15pm) & land (11:36pm) = 10/24 -- 9:36am Kazakhstan)
11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*
11/14/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/16/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.)
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/15/08
Date:	Wednesday, October 15, 2008 1:15:06 PM
Attachments:	

ISS On-Orbit Status 10/15/08

All ISS systems continue to function nominally, except those noted previously or below. *Day 2 of joint E17/18 operations.*

The crew's work/sleep cycle returned to the normal wake-up time of 2:00am EDT; sleeptime tonight remains at the earlier 4:30pm, for an earlier wakeup tomorrow morning, at 1:00am.

Aboard ISS, the E17/18 crew rotation/handover period went underway with full activity schedules for all six residents involved. Volkov, Kononenko, Fincke and Lonchakov had ~2.5 hrs between them for dedicated CDR/CDR & FE/FE handover activities, focusing today on USOS (US Segment), Elektron oxygen generator servicing in the RS (Russian Segment), and the relevant RBS power outlet 10 (English: UOP/ Utility Outlet Panel). In addition, there are "generic" handovers where crewmembers are scheduled together to complete various designated standard tasks.

After wakeup and before breakfast, FE-2 Chamitoff & SFP (Space Flight Participant) Garriott downloaded the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data from their Actiwatches to the HRF-1 (Human Research Facility 1) laptop. Garriott is participating in the SLEEP experiment for NASA. *[To monitor the crewmember's sleep/wake patterns and light exposure, crewmembers wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

As part of the crew's regular morning inspection tour, CDR Volkov, with Kononenko and Fincke, conducted the routine checkup of DC1 (Docking Compartment) circuit breakers and fuses. *[The monthly checkup in the "Pirs" module looks at AZS circuit breakers on the BVP Amp Switch Panel (they should all be On) and the LEDs (light-emitting diodes) of 14 fuses in fuse panels BPP-30 & BPP-36.]*

Major science activities in the RS by Yuri Lonchakov, beginning with activation of the Cryogem-03M (KRIOGEM-03M) thermostatic facility at +29 degC (later reset to +4 degC), today focused on the biotechnological experiment BIOEMULSION, CONJUGATION, BIOEKOLOGIYA/ARIL, and BIO-4. *[BIOEMULSION (BTKh-14): transferring Bioreactor #02 from KT thermostat shell to Cryogem-3M and replacing it in KT with Bioreactor #05 for culturing. CONJUGATION (Pairing): removal of the Recomb-K hybridization experiment from Cryogem, process activation at ambient temperature, photography of Recomb-K hardware, completing activation and returning to Cryogem, set at +4 degC. ARIL: relocating ARIL tubes (in Ziploc bag) from BIOEKOLOGIYA (Bioecology) container #18 to Cryogem. BIO-4: third relocation of RLD containers from KUBIK-2 to MELFI.]*

Sergey Volkov set up the hardware for the Russian MBI-21 PNEVMOKARD experiment and conducted the session, his fifth, which does not allow moving or talking during data recording. Kononenko will have his fifth session tomorrow. The experiment is controlled from the RSE-med A31p laptop, equipped with new software, and uses the TENZOPLUS sphygmomanometer to measure arterial blood pressure. *[PNEVMOKARD (Pneumocard) attempts to obtain new scientific information to refine the understanding about the mechanisms used by the cardiorespiratory system and the whole body organism to spaceflight conditions. By recording (on PCMCIA cards) the crewmember's electrocardiogram, impedance cardiogram, low-frequency phonocardiogram (seismocardiogram), pneumotachogram (using nose temperature sensors), and finger photoplethismogram, the experiment supports integrated studies of (1) the cardiovascular system and its adaptation mechanisms in various phases of a long-duration mission, (2) the synchronization of heart activity and breathing factors, as well as the cardiorespiratory system control processes based on the variability rate of physiological parameters, and (3) the interconnection between the cardiorespiratory system during a long-duration mission and the tolerance of orthostatic & physical activities at the beginning of readaptation for predicting possible reactions of the crewmembers organism during the their return to ground.]*

FE-2 Greg Chamitoff conducted the regular 30-day inspection of the new AED (Automated External Defibrillator) in the CHeCS (Crew Health Care Systems) rack. *[The AED is a portable electronic device that automatically diagnoses the potentially life threatening cardiac arrhythmias of ventricular fibrillation and ventricular tachycardia in a patient. It then can treat them through defibrillation, i.e., the application of electrical therapy which stops the arrhythmia, allowing the heart to re-establish an effective rhythm. AEDs are generally either held by trained personnel who will attend events or are public access units which can be found in places including corporate and government offices, shopping centers, airports, restaurants, casinos, hotels, sports stadiums, schools and universities, community*

centers, fitness centers, health clubs and any other location where people may congregate.]

Volkov worked on the Service Module toilet systems (SM ASU), performing the monthly 30-min. maintenance/servicing of the facility, changing out replaceable ASU parts with new components, i.e., the urine receptacle (MP) and a filter insert (F-V). The old parts were discarded as trash.

In the Soyuz TMA-13/17S Orbital Module, docked at the FGB, Lonchakov installed the LKT local temperature sensor switch (TA251M1B) of the BITS2-12 onboard telemetry system and its ROM/read-only memory unit (PZU TA765B), both kept in storage from an earlier Soyuz.

The FE-2 transferred US condensate from the Lab CCAA (Common Cabin Air Assembly) dehumidifier tank to a CWC (Contingency Water Container, #1070), while monitoring the time it took for the pump to fill the latter (in order to evaluate the performance of the US filter used). *[Starting at 7:20am, it took until 8:05am to reduce the amount of 24.29 kg condensate to 5.71 kg until tank and CWC pressures had equalized.]*

After moving the MATRYOSHKA-R (RBO-3-2) radiation instrumentation from the FGB to the SM (panel 326) yesterday, Yuri Lonchakov today retrieved a new ALC dosimeter kit from Soyuz 17S, mounted the dosimeters on the ALC hardware, activated the AST spectrometer (with memory card ALC-954) and took documentary photography with the Nikon D2X. *[RBO-3-2 is using the ESA/RSC-Energia experiment ALTCRISS (ALC/Alteino Long Term monitoring of Cosmic Rays on the ISS) with its Spectrometer (AST) and ALC equipment, which is periodically moved around and now located again in the SM.]*

Oleg reconfigured the SSC-15 (Station Support Computer 15) in the JAXA Kibo module. *[The reconfiguration consisted in removing the Ethernet hatch drag-through cable and connecting the laptop instead to power & data in the JPM (JEM Pressurized Module) via a 120V Power/Ethernet cord.]*

Sergey unstowed, set up and activated the DAKON-M hardware for the second session of the Russian experiment TEKh-15/IZGIB ("Bend"), taking photography of the activity which will run till 10/19, requiring visual control of hardware operations three times a day and report to the ground. The first IZGIB session, for checkout, was conducted on 9/23. *[IZGIB has the objective to help update mathematical models of the ISS gravitation environment, using accelerometers of the Russian SBI Onboard Measurement System, the GIVUS high-accuracy angular rate vector gyrometer of the SUDN Motion Control & Navigation System and other accelerometers for unattended measurement of micro-accelerations at science*

hardware accommodation locations - (1) in operation of onboard equipment having rotating parts (gyrodynes, fans), (2) when establishing and keeping various ISS attitude modes, and (3) when performing crew egresses into space and physical exercises.]

Chamitoff and Fincke spent handover time on the US ACS OGS (Atmosphere Control & Supply/Oxygen Generation System), going through the steps of setting it up for activation. *[Steps included accessing the OGS rack front and mating the O_2 outlet jumper QD (Quick Disconnect) at the N_2 Purge ORU (Orbit Replaceable Unit, LAB1PD1 panel), then performing an N_2 (nitrogen) purge of the H_2 (hydrogen) sensor and letting the OGA (Oxygen Generation Assembly) powered for ~20 min. Afterwards, the H_2 sensor QDs were reconnected, the rack door closed, and the WDS (Water Delivery System) re-attached and activated.]*

VC-15 Richard Garriott, assisted in part by Russian crewmembers, worked on his daily onboard program which today included –

- INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function), before breakfast (collecting dry saliva sample);
- SLEEP Actiwatch logging;
- Telephone talk to AT;
- SSTV (Slow-Scan TV) ham radio session with Star City/Shchelkovo (with Volkov & Kononenko);
- PMC (Private Medical Conference);
- Ham radio session with Austin, TX (friends & family, Mayor of Austin);
- PRK Visual Acuity evaluation;
- MUSCLE-G (LBP/Low Back Pain) questionnaire;
- MOP-G (Motion Perception; vestibular adaptation to changes in micro-G);
- Earth photography (Asia); and
- Video blogs (e.g., on NASA Sleep Study, Visual Acuity Study, Immune Study, wedding rings, Operation Immortality – developing a digital time capsule for future generations, etc.).

Oleg & Yuri had an hour reserved for replacing and updating RODF (Russian Operations Data File) procedures pages, updating four books (VC Emergency, Technical Experiments, LDM/Long Duration Missions, TORU) and stowing two new ODF CD-ROMs plus two new books (VC15, E17/18 Crew Handover).

CDR Volkov conducted the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the DC1-to-Soyuz tunnel, and the FGB-to-Soyuz and FGB-to-Node passageway. *[This is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently six persons, and one of the two Russian SKV air conditioners still*

off (SKV-1) because it has run out of service life.]

The FE-1 performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM (Service Module). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The daily IMS (Inventory Management System) maintenance was conducted today by Yuri Lonchakov, updating/editing the standard IMS "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Greg & Mike had another ~90 min on their timeline for pre-packing hardware to be returned on STS-126/ULF-2.

The crew had their regular PMCs (Private Medical Conferences), via S-band/audio & Ku-band/video, Richard at ~7:55am, Oleg at ~12:05pm, Yuri at ~12:35pm, Sergey at ~2:00pm, Greg at ~2:15pm. Mike's was yesterday.

Today's schedule also provided for an approximately 1-hr repressurization of the ISS atmosphere with O_2 from Progress 30P's SrPK tankage, conducted by Oleg and Yuri.

The E17 crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR/2.5h, FE-1/2.5h), and RED resistive exercise device (FE-2).

Later, Greg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

CEO (Crew Earth Observations) photo target uplinked for today was **Ouarkziz Impact Crater, Algeria** *(weather was predicted to be clear over this 3.5 km in diameter impact structure. Looking for the distinctive linear features caused by folded strata of the Ouarkziz Monocline as an indicator of the crater's location. The circular crater is distinctive within the folded rock beds when viewed with the long lens. Nadir-viewing, overlapping frames taken as ISS passed over the monocline from SW to NE should have captured the crater).*

CEO photography can be studied at this “Gateway” website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

Week 26 Scheduled Main Activities:

- *Thu. (10/16):* ISS-18 expmts.; VC15 Prgm.; EDV replace; ULF-2 prepacking; Handovers ISS-18; WRM CWC audit; PEPS inspect.; Iridium recharge; IP-1 check.
- *Fri. (10/17):* ISS-18 expmts.; VC15 Prgm.; PAO; GOGU tagup; ULF-2 prepacking; Handovers ISS-18; ODNT/LBNP OBT; IDZ-2 smoke detector mntn.; CMS sampling; IP-1 check.
- *Sat. (10/18):* ISS-18 expmts.; VC15 Prgm.; BMP ch.1 regen.; GANK sampling; IP-1 check; FFQ; Handovers ISS-18; Symbolic Activity; OGS deact.; DOUG review for JEMRMS checkout.
- *Sun. (10/19):* ISS-18 expmts.; VC15 Prgm.; Handovers ISS-18; BMP ch.2 regen.; JEMRMS DOUG review ; JEMRMS activities/checkout ; MBI-15 NEURO; O-OHA assess.; IP-1 check; Elektron BZh check.

ISS Orbit (as of this morning, 4:32am EDT [= epoch]):
Mean altitude -- 352.4 km
Apogee height -- 354.7 km
Perigee height -- 350.1 km
Period -- 91.59 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0003436
Solar Beta Angle -- -58.9 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 119 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56744

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
10/23/08 -- Soyuz TMA-12/16S undock (DC1 nadir, 8:15pm) & land (11:36pm) = 10/24 -- 9:36am Kazakhstan)
11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*
11/14/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/16/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.)
02/09/09 -- Progress M-66/31P undocking & deorbit

02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/14/08
Date:	Tuesday, October 14, 2008 12:25:45 PM
Attachments:	

ISS On-Orbit Status 10/14/08

All ISS systems continue to function nominally, except those noted previously or below.

Yest kasaniya! **Soyuz TMA-13/17S docked smoothly** at the FGB nadir port at 4:26am EDT, seven minutes ahead of time, with Expedition 18 crewmembers CDR-18 Michael Fincke, Soyuz CDR/FE-1-18 Yuri Lonchakov, and SFP (Spaceflight Participant) Richard Garriott, the 15th Visiting Crewmember (VC) and the 6th "space tourist". He and Sergey are the first children of veteran space-flyers who also have made it to space. After about 1.5 hrs spent in Soyuz on pre-transfer activities, the crew opened hatches, followed by crew transfer, the traditional joyful welcome event and the installation of the BZV QD (quick disconnect) clamps by Lonchakov and Kononenko. *[After successful "kasaniya" (contact), automatic "sborka" (closing of Soyuz & FGB port hooks & latches) took place shortly thereafter while ISS was in free drift. Attitude control authority had been handed over to the Russian MCS (Motion Control System) at ~00:25am and was returned to US CMG control at ~6:58am. For the 17S docking, Russian thrusters were disabled during Soyuz volume pressurization and clamp installation; they were afterwards returned to active attitude control (~4:53am. fore hatch opening, the crew performed leak checks of the Soyuz modules and the Soyuz/FGB interface vestibule. They then doffed their Sokol suits and set them up for drying, deactivated the Atmosphere Purification Unit (BOA) in the Descent Module (SA), replaced the Soyuz ECLSS LiOH cartridges, equalized Soyuz/ISS pressures, and put the spacecraft into conservation mode on ISS integrated power. Fincke & Lonchakov are replacing Expedition 17 CDR Volkov & FE-1 Kononenko. FE-2 Dr. Gregory Chamitoff remains on the station, joining Expedition 18 until next month (November) when he is replaced by U.S. Astronaut Sandy Magnus, arriving on STS-126/ULF2. Richard Garriott, the son of veteran U.S. Skylab/Shuttle Astronaut Owen Garriott, returns with Sergey & Oleg on 10/23 in Soyuz TMA-12/16S.]*

The ISS crew's work/sleep cycle shifted this morning by one hour, from wakeup at 2:00am to 1:00am EDT (sleeptime tonight at 4:30pm, from 5:30pm).

FE-2 Chamitoff continued his third week-long session of the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment, using payload software for data downloading and filling in questionnaire entries in the experiment's session file on the HRF-1 laptop. *[To monitor the crewmember's sleep/wake patterns and light exposure, Greg wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. He will be joined in this experiment by Fincke and Garriott. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Gregory also had the fifth day of his second SOLO (Sodium Loading in Microgravity) session, which runs in two blocks of six days each. Today, Greg again began with measurements and sampling of body mass (with SLAMMD/Space Linear Acceleration Mass Measurement Device), blood (with PCBA/Portable Clinical Blood Analyzer), and urine, to continue for three more days. Samples were stowed in the MELFI (Minus-Eighty Laboratory Freezer for ISS). *[Background: For the SOLO experiment, Chamitoff follows a special high-salt diet, for which prepared meals are provided onboard. All three daily meals are being logged on sheets stowed in the PCBA Consumable Kit in the MELFI along with control solution and cartridges for the PCBA. Blood and urine samples are stowed in the freezer. SOLO, an ESA/German experiment from the DLR Institute of Aerospace Medicine in Cologne/Germany, investigates the mechanisms of fluid and salt retention in the body during long-duration space flight. Background: The hypothesis of an increased urine flow as the main cause for body mass decrease has been questioned in several recently flown missions. Data from the US SLS1/2 missions as well as the European/Russian Euromir `94 & MIR 97 missions show that urine flow and total body fluid remain unchanged when isocaloric energy intake is achieved. However, in two astronauts during these missions the renin-angiotensin system was considerably activated while plasma ANP concentrations were decreased. Calculation of daily sodium balances during a 15-day experiment of the MIR 97 mission (by subtracting sodium excretion from sodium intake) showed an astonishing result: the astronaut retained on average 50 mmol sodium daily in space compared to balanced sodium in the control experiment. SLAMMD, performed first on Expedition 12 in December 2005, provides an accurate means of determining the on-orbit mass of humans spanning the range from the 5th percentile Japanese female and the 95th percentile American male. The procedure, in accordance with Newton's 2nd Law of Motion, finds the mass by dividing force, generated by two springs inside the SLAMMD drawer, by acceleration measured with a precise optical instrument that detects the position versus time trajectory of the SLAMMD guide arm and a micro controller which collects the raw data and provides the precise timing. The final computation is done via portable laptop computer with SLAMMD unique software. To calculate their*

mass, crewmembers wrap their legs around a leg support assembly, align the stomach against a belly pad and either rest the head or chin on a head rest. For calibration, an 18-lbs. mass is used at different lengths from the pivot point, to simulate different mass values. Crew mass range is from 90 to 240 lbs.]

Steps by the ISS crew leading up to the Soyuz docking included:

- Testing, by Kononenko, of the RS (Russian Segment) video system, which uses the SONY HDV camera for transmitting over the MPEG-2 (Moving Pictures Expert Group 2) encoder from FGB & SM to downlink via U.S. OpsLAN and Ku-band in "streaming video" packets *[deactivated and disassembled later in the day by Volkov],*
- Configuring and activating the A31p SSC (Station Support Computer) laptop for the TV conversion to NTSC and Ku-band, by Chamitoff *[later, Greg removed the downlink test equipment and disconnected the hook-up of the UOP DCP (utility outlet panel/display & control panel) power bypass cable at the CUP RWS (Cupola Robotic Work Station)],*
- Activating the video equipment for covering the Soyuz approach & docking (CDR),
- Oleg configuring the station comm (STTS) for the docking *[plus reconfiguring it afterwards for the nominal post-docking hardline mode (MBS)],*
- Powering down the amateur radio (ham) equipment to prevent RF interference with the KURS automated approach & docking system (FE-2), and
- Monitoring approach and final docking of Soyuz from the SM (FE-1).

After the successful docking at the FGB nadir port –

- CDR Volkov downlinked the docking video via Ku-band,
- FE-1-18 Lonchakov & CDR-18 Fincke conducted the ~1 hr FGB interface leak check,
- Kononenko switched hatch KVDs (Pressure Equalization Valves) between FGB GA and Soyuz to electric control mode,
- The crew opened the Soyuz-FGB transfer tunnel hatches,
- Both crews then joined for the obligatory standard Safety Briefing of the newcomers by CDR Volkov to familiarize them with procedures and escape routes in case of an emergency *[the Briefing included pointing out the location of the "Emergency Response/Visiting Crew" books, showed how to move about the station without getting hurt or accidentally disturbing air flow meters/sensors (PP IP-1) and familiarized the SFP with his switch to a different Soyuz for return],*
- As part of Soyuz deactivation after the docking, Yuri Lonchakov installed the intermodular air exchange ducting between the Soyuz (through both Orbital & Descent Modules) and the FGB *[the two optional modes for the ducting configuration are with & without air heating],*

- Volkov meanwhile set up the three Sokol spacesuits and their gloves for drying out, followed later today by
- Yuri and Sergey swapped out Chamitoff's and Garriott's IELKs (Individual Equipment & Liner Kits, Russian: USIL) between the two Soyuz vehicles, TMA-12/16S & TMA-13/17S, including their tailored Sokol spacesuits. The IELKs of Fincke & Lonchakov are already in the 17S spacecraft that has now become the Expedition 18 CRV (Crew Return Vehicle), good for a maximum of 200 days in space, while Volkov's & Kononenko's IELKs remain in 16S for the return on 10/23. *[A crewmember is not considered transferred until her/his IELK, AMP (Ambulatory Medical Pack) and ALSP (Advanced Life Support Pack) drug kit are transferred. After today's installation of the VC15 IELK, Richard is now considered a 16S crewmember, and* ***Expedition 18 has technically begun its residence*** *aboard ISS, with Sergey Volkov passing his CDR-baton to Mike Fincke. TMA-12 has been docked at ISS since 4/10/08. By the time of its return on 10/23 (with one pyro bolt removed), the spacecraft will have spent 199 days in space, one day short of its "warranty" life. Of course, Volkov & Kononenko also will have accumulated 199 days in space at their return.]*

After activating the three thermostat-controlled sample containers KUBIK-1 (+21 degC), KUBIK-2 (+37 degC) and KRIOGEM-03 (+4 degC) in the RS, Oleg and Yuri transferred, installed and photographed high-priority science equipment, including –

- BIO-12/REGENERATION *(a study of micro-G effects on structural and functional recovery of damaged organs and tissues in animal tests, specifically Planaria worms)*,
- BTKh-10/KONYUGATSIYA *("Conjugation" in its Biokont-T container, also in KRIOGEM, which deals with the processes of genetic material transmission using bacterial conjugation, in the Biokont-T container and Rekomb-K hardware in the KRIOGEM-03M)*,
- BTKh-14/BIOEMULSIYA *(Bioemulsion, which investigates the design and improvement of a closed-type autonomous thermostat-controlled bioreactor for obtaining biomass of organisms and bioactive substances (BAV) without additional ingredients input or removal of metabolism products, for bacterial, enzymatic, and pharmaceutical preparations)*,
- BTKh-12/ BIOEKOLOGIYA *(Bioecology, kits & containers with BIOTREK, LAKTOLEN, ARIL, and ANTIGEN) [BTKh-5/ARIL studies the effects of space flight on cultures of Lactolen- and Interleukin ARIL producing cells]* and
- BIO-4 *(the latest in a series of ESA's BIO payload system which makes use of the KUBIK incubator facilities, currently the "facilities of choice" for this program)*.

Sergey Volkov took Richard Garriott on the standard one-hour guided tour of the ISS. *[The tour was to acquaint the SFP with both station segments, his living*

quarters in the RS, his work station in the DC1 Docking Compartment, other work locations (e.g., SM windows #7 & #8 for his Earth photo/video activities), the sites for his scheduled once-daily VHF conferences with his consultant group and his ham radio sessions, location of his RSK2 laptop, stowage of his VC15 experiments, uplink printouts and camera equipment for his use, email ops, and PFC (Private Family Conference) using the IP (Internet Protocol) phone.]

Assisted by Sergey, Richard later –

- Installed his removable HDD (Hard Disk Drive) in the RSK2 A31p laptop,
- Transferred his PCG (Protein Crystallization in micro-G) experiment container from Soyuz, set it up in the SM and photographed it,
- Configured the ham radio in slow-scan TV mode,
- Donned the Actiwatch for the U.S. SLEEP experiment (in which he participates along with Mike Fincke),
- Performed his first on-board experiment, Visual Acuity in Space (PRK), with eye charts and log charts, which he will conduct every day, along with SLEEP log entries and, at some days, the Integrated Immune assessment with liquid collections, and
- Filled in the daily questionnaires for the two medical ESA assessments MUSCLE-G (LBP/Low Back Pain) and MOP (Motion Perception, study of vestibular adaptation to gravity transition).

Earlier in the day, FE-2 Chamitoff worked on the MELFI (Minus-Eighty Laboratory Freezer for ISS) to free a stuck drawer and prepare the freezer for the subsequent transfer of the new BIO-4 payload from the KUBIK-2 facility to MELFI.

Gregory also used the HRF printer to print out an uplinked 30-page “17S SFP Science Packet” for Richard Garriott, containing detailed instructions, timeline overview, SLEEP log sheets, visual acuity eye charts and forms, etc.

Oleg Kononenko deactivated the hardware of the MATRYOSHKA-R (RBO-3-2) radiation instrumentation on panel 429 in the FGB, packed the ALC-952 data storage card for return on Soyuz 16S and took documentary photographs. Afterwards, he deinstalled the AST Spectrometer in the FGB, moved it to the SM and re-installed it on panel 326. *[RBO-3-2 is using the ESA/RSC-Energia experiment ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS/ ALC) with its Spectrometer (AST) and ALC equipment, which is periodically moved around and now located again in the SM.]*

Greg Chamitoff set up the NetMeeting application on SSC-1 in the SM for the SFP and conducted a network conference test. *[This capability will allow the SFP to participate in a conference later during the mission.]*

Afterwards, the FE-2 relocated more empty food containers to Node-2 and prepacked them to get them ready for return on ULF-2.

Chamitoff also updated the SODF POC (System Operations Data File/Portable Onboard Computer) procedures book with File Server Recovery procedures printed out from a file uplinked overnight.

The CDR meanwhile downloaded the accumulated structural dynamics data from this morning's Soyuz docking from the IWIS RSUs (Internal Wireless Instrumentation System/Remote Sensor Units).

The FE-2 had an additional hour reserved for unpacking US cargo delivered on Progress 30P.

Later, Greg also spent ~30 min on US cargo unpacking from Soyuz 17S.

Volkov performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM (Service Module). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The daily IMS (Inventory Management System) maintenance was conducted today by Oleg, updating/editing the standard IMS "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The FE-2 completed another one of the periodic inspections of the RED (Resistive Exercise Device) canister cords and accessories, currently done every two weeks.

The crew performed an abbreviated physical workout program on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), and RED resistive exercise device (FE-2).

FE-1 Kononenko conducted the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the DC1-to-Soyuz tunnel, and the FGB-to-Soyuz and FGB-to-Node passageway. *[This is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently six persons, and one of the two Russian SKV air conditioners still off (SKV-1) because it has run out of service life.]*

Before his sleep time tonight, Gregory will unstow the INTEGRATED IMMUNE

Saliva Collection kit (#1005) in preparation for the upcoming series of sample collections by himself, Mike Fincke and Richard Garriott, the latter starting already tomorrow. Greg and Mike will begin their collections on 10/17. *[Integrated Immune is a 24-hr.assessment of human immune system changes, with the objective to investigate immune neuro-endocrine reactions in the space environment by studying samples of saliva, blood and urine using collection kits and the biomedical (MBI) protection kit, to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected at intervals during the collection day using a specialized book that contains filter paper. The liquid saliva collections require that the crewmember soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations. The on-orbit blood samples are collected right before undocking and returned on the Shuttle so that analysis can occur with 48 hours of the sampling. This allows assays that quantify the function of different types of white blood cells and other active components of the immune system. Saliva samples are secured in the MELFI (Minus-Eighty Laboratory Freezer for ISS). Also included are entries in a fluid/medications intact log, and a stress-test questionnaire to be filled out by the subject at begin and end. Urine is collected during a 24-hour period, conventionally divided into two twelve-hour phases: morning-evening and evening-morning.]*

At ~1:45pm EDT, CDR-18 Fincke had his first regular weekly PMC (Private Medical Conference) via S- & Ku-band audio/video.

No CEO (Crew Earth Observation) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

Week 26 Scheduled Main Activities:

- *Wed. (10/15):* IMMUNE; SLEEP log; ISS-18 expmts.; VC15 Prgm.; Handovers ISS-18; AED inspect.; WRM CWC fill; OGS activ.; Ham; IP-1 check.
- *Thu. (10/16):* ISS-18 expmts.; VC15 Prgm.; EDV replace; ULF-2 prepacking; Handovers ISS-18; WRM CWC audit; PEPS inspect.; Iridium recharge; IP-1 check.
- *Fri. (10/17):* ISS-18 expmts.; VC15 Prgm.; PAO; GOGU tagup; ULF-2 prepacking; Handovers ISS-18; ODNT/LBNP OBT; IDZ-2 smoke detector mntn.; CMS sampling; IP-1 check.
- *Sat. (10/18):* ISS-18 expmts.; VC15 Prgm.; BMP ch.1 regen.; GANK

sampling; IP-1 check; FFQ; Handovers ISS-18; Symbolic Activity; OGS deact.; DOUG review for JEMRMS checkout.

- *Sun. (10/19):* ISS-18 expmts.; VC15 Prgm.; Handovers ISS-18; BMP ch.2 regen.; JEMRMS DOUG review ; JEMRMS activities/checkout ; MBI-15 NEURO; O-OHA assess.; IP-1 check; Elektron BZh check.

ISS Orbit (as of this morning, 8:50am EDT [= epoch]):
Mean altitude -- 352.5 km
Apogee height -- 355.1 km
Perigee height -- 349.9 km
Period -- 91.59 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.000381
Solar Beta Angle -- -56.5 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 100 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56731

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
10/23/08 -- Soyuz TMA-12/16S undock (DC1 nadir, 8:15pm) & land (11:36pm) = 10/24 -- 9:36am Kazakhstan)
11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*
11/14/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/16/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.)
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**

07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/13/08
Date:	Monday, October 13, 2008 11:15:00 AM
Attachments:	

ISS On-Orbit Status 10/13/08

All ISS systems continue to function nominally, except those noted previously or below. *Columbus Day – off-duty for CDR Volkov, FE-1 Kononenko, FE-2 Chamitoff. Underway: Week 26 of Increment 17.*

Soyuz TMA-13/17S, with Exp-18 crewmembers CDR Michael Fincke, Soyuz CDR/ ISS-18 FE-1 Yuri Lonchakov, and SFP (Spaceflight Participant) Richard Garriott, 15th guest cosmonaut for the RS (Russian Segment), continues to catch up with the ISS for the **docking tomorrow morning at ~4:33am EDT.** *[FD2 activities, started yesterday afternoon with Soyuz crew wakeup on Orbit 12, include systems & crew health status reports to TsUP, preparation of the Soyuz Habitation Module (SA) workspace, building attitude for and executing the DV3 burn, placing Soyuz back in its sun-spinning "barbecue" mode (ISK), and swapping CO_2 absorption cartridges (LiOH) in the BO. Afterwards, the crewmembers put on their Sokol suits and PKO biomed harnesses, transferred to the SA, activated its air purification system (SOA) and closed the hatch to the Descent Module (BO). After activation of the active Kurs-A system on Soyuz and of the passive Kurs-P on the Service Module (SM), with a short Kurs-A/P test and several additional adjustment burns during automated rendezvous, station fly-around to align with the FGB nadir port will begin tomorrow morning at ~4:05am at ~400m range, followed by station keeping at ~160m (~4:14am) and docking at the FGB at ~4:33am. Fincke & Lonchakov will replace Exp-17 CDR Volkov & FE-1 Kononenko. FE-2 Dr. Gregory Chamitoff remains on the station, joining Exp-18 until next month (November) when he is replaced by U.S. Astronaut Sanda Magnus, arriving on STS-126/ULF2. Richard Garriott, the son of veteran U.S. Astronaut Owen Garriott (Skylab, Shuttle), will return with Sergey & Oleg on 10/23 in Soyuz TMA-12/16S.]*

FE-2 Chamitoff started out with his third week-long session of the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment, using payload software for data downloading and filling in questionnaire entries in the experiment's session file on the HRF-1 laptop. *[To monitor the crewmember's sleep/wake patterns and light exposure, Greg wears a special Actiwatch device which*

measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]

Gregory also had the fourth day of his second SOLO (Sodium Loading in Microgravity) session, which runs in two blocks of six days each. Today, Greg again began with measurements and sampling of body mass (with SLAMMD/Space Linear Acceleration Mass Measurement Device), blood (with PCBA/Portable Clinical Blood Analyzer), and urine, to continue for three more days. Samples were stowed in the MELFI (Minus-Eighty Laboratory Freezer for ISS). *[Background: For the SOLO experiment, Chamitoff follows a special high-salt diet, for which prepared meals are provided onboard. All three daily meals are being logged on sheets stowed in the PCBA Consumable Kit in the MELFI along with control solution and cartridges for the PCBA. Blood and urine samples are stowed in the freezer.]*

Sergey & Oleg conducted their third preliminary training session with the Russian "Chibis" LBNP suit (lower body negative pressure; Russian: ODNT), ramping up to get them ready for returning to gravity on 10/23. Assisting each other in turn as CMO (Crew Medical Officer), the subjects were supported in their two one-hour sessions by ground specialist tagup via VHF at 5:25am (DO3) & 7:00am EDT (DO4). *[The assessment uses the Gamma-1 ECG equipment with biomed harness, skin electrodes and a blood pressure and rheoplethysmograph cuff wired to the cycle ergometer's instrumentation panels. The Chibis ODNT provides gravity-simulating stress to the body's cardiovascular/circulatory system for evaluation of Volkov's and Kononenko's orthostatic tolerance (e.g., the Gauer-Henry reflex) after several months in zero-G. The preparatory training generally consists of first imbibing 150-200 milliliters of water or juice, followed by two cycles of a sequence of progressive regimes of reduced ("negative") pressure, set today at -20, -25, -30 and -35 mm Hg (Torr) for five min. each while shifting from foot to foot at 10-12 steps per minute, wearing a sphygmomanometer to measure blood pressure. The body's circulatory system interprets the pressure differential between upper and lower body as a gravity-like force pulling the blood (and other liquids) down. Chibis data and biomed cardiovascular readings are recorded. The Chibis suit (not to be confused with the Russian "Pinguin" suit for spring-loaded body compression, or the "Kentavr" anti-g suit worn during reentry) is similar to the U.S. LBNP facility (not a suit) used for the first time on Skylab in 1973/74, although it appears to accomplish its purpose more quickly.]*

For another try at the BCAT-4 (Binary Colloid Alloy Test 4) experiment with a new SSC (Station Support Computer) for his VolSci (Voluntary Science) program session, Gregory configured the equipment in the Lab Avionics Racks 2 & 3 seat

track area (no MWA/Maintenance Work Area table), along with camcorder and still camera,- to take video and photos of his subsequent sample homogenization plus the last sample (#3), and then initiated the activity. *[The FE-2 set up the SGSM (slow growth sample module) by mixing the samples 8, 9, 10, and 3 and starting automated photography of sample 3 with the Kodak DCS-760 digital still camera controlled by the EarthKAM software running on a new SSC (Station Support Computer), automatically taking one photo every hour of sample 3 for the next six days.]*

In preparation for tomorrow's Soyuz docking and the preceding thruster activity, the FE-2 ensured that the protective science window shutters in the US Lab and JAXA Kibo JPM (JEM Pressurized Module) are closed.

At ~105am EDT, the crew downlinked two PAO video messages of greetings,- one to the opening ceremony on 10/17 of the 16th International Space Olympiad for Schoolchildren in Korolev, the other to a Moscow event to present books by Konstantin E. Tsiolkovsky. *[The International Space Olympiad for Schoolchildren is conducted annually by the City of Korolev's Council of Education jointly with RSC-Energia. This time around it's the XVI Olympiad that will take place from 10/15-26 in Korolev, dedicated to the 70th Anniversary of the City of Korolev and to the 45th Anniversary of Valentina N. Tereshkova's flight to space. High school students from Korolev, Moscow Region, USA, and the UK are among the participants of the International Space Olympiad. The best of delegates will come to TsUP to see the ISS crew during a comm session. Also, on 10/16, a presentation of new K. E. Tsiolkovsky's books to be sent to the ISS Space Library in orbit will take place at Biblio-Globus book store in Moscow. Media, representatives of Roskosmos, faculty and students of Bauman University, MAI, MATI, and other institutions of higher learning, are invited to this presentation. The ISS crew was to point out that there are already two books by Konstantin Eduardovich on board -- "The Science Faith Shield " and "About My Life" – as well as his picture.]*

Sergey Volkov performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM (Service Module). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Chamitoff's weekly PFC (Private Family Conference), which had to be aborted yesterday due to a video issue, was re-scheduled today for ~4:10pm, as usual via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), and RED resistive exercise device (FE-2). Sergey's & Oleg's exercise regimen today was in part accounted for by their Chibis/ODNT training activity.

An activity to upgrade SSC (Station Support Computer) laptops to Wireless capability (by installing wireless cards and modifying software) remains on Greg's discretionary "job jar" task list.

17S Flight Plan Overview:

- Flight Day 2
  - Post-sleep activities; BO Workstation prepared; data for DV3 burn uplinked; crew tests RUO-2 & RUD-2 rotational and translational hand controllers; DV3 attitude established by crew; DV3 burn executed; Soyuz back in ISK attitude; crew swaps CO2 filters in BO; crew sleep.
- Flight Day 3
  - Post-sleep activities; KURS-A heaters activated; data for automated rendezvous uplinked; crew dons Sokols; SOA deactivated in BO and activated in SA; crew ingresses SA, closes BO-SA hatch and dons harnesses for docking; DV5 burn; automated rendezvous & docking via KURS-P in ISS and KURS-A in Soyuz; docking; pressure equalized between Soyuz and ISS ; crew transfers.

No CEO (Crew Earth Observation) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

Week 26 Scheduled Main Activities:

- *Tue. (10/14):* TV prep.; Soyuz TMA-13/17S docking; Sokol dryout; KRIOGEM & KUBIK activate; Safety Briefing; Priority Transfers; Soyuz deact.; IWIS dwnl.; SODF update; SLEEP Actiwatch init.; VC15 Program.
- *Wed. (10/15):* IMMUNE; SLEEP log; ISS-18 expmts.; VC15 Prgm.; Handovers ISS-18; AED inspect.; WRM CWC fill; OGS activ.; Ham; IP-1 check.
- *Thu. (10/16):* ISS-18 expmts.; VC15 Prgm.; EDV replace; ULF-2 prepacking; Handovers ISS-18; WRM CWC audit; PEPS inspect.; Iridium recharge; IP-1 check.
- *Fri. (10/17):* ISS-18 expmts.; VC15 Prgm.; PAO; GOGU tagup; ULF-2

prepacking; Handovers ISS-18; ODNT/LBNP OBT; IDZ-2 smoke detector mntn.; CMS sampling; IP-1 check.

- *Sat. (10/18):* ISS-18 expmts.; VC15 Prgm.; BMP ch.1 regen.; GANK sampling; IP-1 check; FFQ; Handovers ISS-18; Symbolic Activity; OGS deact.; DOUG review for JEMRMS checkout.
- *Sun. (10/19):* ISS-18 expmts.; VC15 Prgm.; Handovers ISS-18; BMP ch.2 regen.; JEMRMS DOUG review ; JEMRMS activities/checkout ; MBI-15 NEURO; O-OHA assess.; IP-1 check; Elektron BZh check.

ISS Orbit (as of this morning, 5:13am EDT [= epoch]):
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Apogee height -- 355.0 km
Perigee height -- 350.2 km
Period -- 91.59 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0003502
Solar Beta Angle -- -53.4 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 85 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56713

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
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10/23/08 -- Soyuz TMA-12/16S undock (DC1 nadir, 8:15pm) & land (11:36pm) = 10/24 -- 9:36am Kazakhstan)
11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*
11/14/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
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11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
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02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 -- Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking

04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

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http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/12/08
Date:	Sunday, October 12, 2008 2:04:07 PM
Attachments:	image001.gif

ISS On-Orbit Status 10/12/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – off-duty day for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff. Ahead: Week 26 of Increment 17.*

Soyuz TMA-13 (17S) launched flawlessly this morning on time at 3:01:38am EDT carrying ISS-18 CDR Michael Fincke (first American to launch twice on a Soyuz), Soyuz CDR/ISS-18 FE-1 Yuri Lonchakov, and SFP/VC15 Richard Garriott ***(picture, below)***. Separations from second & third stage were nominal. Orbit was attained at L+ 8:45 min at an altitude of 230.3 km (perigee ~200.7 km/apogee ~259.9 km, downrange ~520 km, velocity ~7.50 km/s, orbit period 88.8 min). Antennas and solar arrays deployed nominally at orbit insertion. 17S has a planned two-day rendezvous profile, to aim for docking on Thursday, 10/14, at (12:33pm Moscow time). *See Flight Plan, below. [At orbit insertion, Soyuz unfolded two solar arrays, four Kurs antennas, one TORU/Rassvet-M antenna and one telemetry antenna. Later, the crew activated antenna heaters, set the maneuver mode, turned on the RKO orbit radio tracking system, started leak checks, etc. Two orbit adjustment burns of ~5 min duration each were executed this morning, DV1 (~17.91 m/s) at 6:42am, DV2 (9.40 m/s) at 7:22am, both with the SKD main engine. After the two-day "chase", supported by several more midcourse burns, 17S will dock at the FGB nadir port on 10/14 at ~4:38am EDT (12:33pm Moscow time).]*

FE-2 Chamitoff had the third day of his second SOLO (Sodium Loading in Microgravity) session, which runs in two blocks of six days each. Today, Greg again began with measurements and sampling of body mass (with SLAMMD/Space Linear Acceleration Mass Measurement Device), blood (with PCBA/Portable Clinical Blood Analyzer), and urine, to continue for three more days. Samples were stowed in the MELFI (Minus-Eighty Laboratory Freezer for ISS). *[Background: For the SOLO experiment, Chamitoff follows a special high-salt diet, for which prepared meals are provided onboard. All three daily meals are being logged on sheets stowed in the PCBA Consumable Kit in the MELFI along with control solution and cartridges for the PCBA. Blood and urine samples are stowed in the freezer. SOLO, an ESA/German experiment from the DLR Institute of Aerospace Medicine in Cologne/Germany, investigates the mechanisms of fluid and salt retention in the body during long-duration space flight. Background: The hypothesis of an increased urine flow as the main cause for body mass decrease has been questioned in several recently flown missions. Data from the US SLS1/2 missions as well as the European/Russian Euromir `94 & MIR 97 missions show that urine flow and total body fluid remain unchanged when isocaloric energy intake is achieved. However, in two astronauts during these missions the renin-angiotensin system was considerably activated while plasma ANP concentrations were decreased. Calculation of daily sodium balances during a 15-day experiment of the MIR 97 mission (by subtracting sodium excretion from sodium intake) showed an astonishing result: the astronaut retained on average 50 mmol sodium daily in space compared to balanced sodium in the control experiment. SLAMMD, performed first on Expedition 12 in December 2005, provides an accurate means of determining the on-orbit mass of humans spanning the range from the 5th percentile Japanese female and the 95th percentile American male. The procedure, in accordance with Newton's 2nd Law of Motion, finds the mass by dividing force, generated by two springs inside the SLAMMD drawer, by acceleration measured with a precise optical instrument that detects the position versus time trajectory of the SLAMMD guide arm and a micro controller which collects the raw data and provides the precise timing. The final computation is done via portable laptop computer with SLAMMD unique software. To calculate their mass, crewmembers wrap their legs around a leg support assembly, align the stomach against a belly pad and either rest the head or chin on a head rest. For calibration, an 18-lbs. mass is used at different lengths from the pivot point, to simulate different mass values. Crew mass range is from 90 to 240 lbs.]*

In the JAXA Kibo JPM (JEM Pressurized Module), Gregory supported tonight's continuing Marangoni Surface experimentation in the FPEF (Fluid Physics Experiment Facility), ground-commanded from the SSIPC (Space Station Integration & Promotion Center) at Tsukuba/Japan, by activating the MMA (Microgravity Measurement Apparatus) and its laptop (MLT), first powering up the MMA's NCU/RSU (Network Control Unit/Remote Sensor Unit) set from the Ryutai rack's UDC (Utility DC-to-DC Converter), then turning on both NCU/RSU and MLT. *[Tsukuba is conducting the Marangoni experiment basically only during crew sleep (for quiescence), starting again tonight until 10/16 (except for 10/9). Running time tonight will be from 5:30pm EDT to 2:00am. Crewmembers can enter Kibo during the experiment but are advised not to cause any major disturbance of the micro-G environment.]*

Also in the JAXA Kibo module, the FE-2 removed & replaced a number of recording disks (#1030, #1031, #1032, #1033, #1034) of the IPU VRU (Image Processing Unit/Video Recording Unit).

Sergey Volkov performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM (Service Module), including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

SOZh checkups by the CDR today also include the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem, gathering weekly data on total operating time & "On" durations for reporting to TsUP-Moscow.

Chamitoff had the usual three hours reserved for his part of the regular weekly station cleaning in the USOS (US Segment), including COL (Columbus Orbital Laboratory) and Kibo, that was not scheduled yesterday alongside the RS (Russian Segment) "uborka" housecleaning by his two crewmates.

At ~10:15am, Greg had his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR/2.5h, FE-1/2.5h, FE-2), and RED resistive exercise device (FE-2).

Working off the discretionary "time permitting" task list, CDR Volkov ran another session for Russia's Environmental Safety Agency (EKON), making observations and taking KPT-3 aerial photography with the NIKON D2X camera of environmental conditions in Russia. *[Today's target were London and Brussels.]*

A second item on the discretionary task list for FE-1 Kononenko was another run of the Russian DZZ-2 "Diatomeya" ocean observations program, the last one for Expedition 17, using the NIKON-F5 DCS still camera and the HDV (high-definition) video camcorder from SM window 8 for ~20 min to record high production water areas. *[Target zones today in the Atlantic Ocean were the coastal area of Brazil to the Strait of Gibraltar, and from the Gulf of Mexico to the English Channel, in the Pacific Ocean the Line Archipelago to the US coast.]*

Also off the Russian suggestions list, Kononenko performed a session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program, using the D2X to take telephotos. *[Uplinked target zones were the Ugra National Park, forest vegetation in the steppe, the northernmost island of the Galapagos archipelago, and Darwin Island.]*

As generally every day now, today starting at 9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) is running intermittently for two half-cycles to control $ppCO_2$ levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

An activity to upgrade SSC (Station Support Computer) laptops to Wireless capability (by installing wireless cards and modifying software) remains on Chamitoff's discretionary "job jar" task list.

17S Flight Plan Overview:

- Flight Day 1:
  - Launch to Orbit, ~9 min in duration; auto deployment of solar arrays & antennas; pressurization of prop tanks and filling of Soyuz manifolds; docking probe extended; leak check by crew of BO & SA modules; KURS self tests; test of BDUS angular rate sensors; attitude established (OSK/ LVLH); crew opens BO-SA hatch, ingresses BO and doffs Sokol suits; test of RUO rotational hand controller; Soyuz put in ISK (sun spuinning/«barbecue») mode; data for DV1 & DV2 burns uplinked; SOA air purification system activated in BO and deactivated in SA; DV1 burn; DV2 burn; Soyuz back in ISK attitude; crew clean & dry Sokols; crew sleep.
- Flight Day 2
  - Post-sleep activities; BO workstation prepared; data for DV3 burn uplinked; crew tests RUO-2 & RUD-2 rotational and translational hand controllers; DV3 attitude established by crew; DV3 burn executed; Soyuz back in ISK attitude; crew swaps CO2 filters in BO; crew sleep.
- Flight Day 3
  - Post-sleep activities; KURS-A heaters activated; data for automated rendezvous uplinked; crew dons Sokols; SOA deactivated in BO and activated in SA; crew ingresses SA, closes BO-SA hatch and dons harnesses for docking; DV5 burn; automated rendezvous & docking via KURS-P in ISS and KURS-A in Soyuz; docking; pressure equalized between Soyuz and ISS ; crew transfers.

No CEO (Crew Earth Observation) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

Week 26 Scheduled Main Activities:

- *Mon. (10/13):* SOLO #2; ODNT/LBNP OBT; PAO.
- *Tue. (10/14):* TV prep.; Soyuz TMA-13/17S docking; Sokol dryout; KRIOGEM & KUBIK activate; Safety Briefing; Priority Transfers; Soyuz deact.; IWIS dwnl.; SODF update; SLEEP Actiwatch init.; VC15 Program.
- *Wed. (10/15):* IMMUNE; SLEEP log; ISS-18 expmts.; VC15 Prgm.; Handovers ISS-18; AED inspect.; WRM CWC fill; OGS activ.; Ham; IP-1 check.
- *Thu. (10/16):* ISS-18 expmts.; VC15 Prgm.; EDV replace; ULF-2 prepacking; Handovers ISS-18; WRM CWC audit; PEPS inspect.; Iridium recharge; IP-1 check.
- *Fri. (10/17):* ISS-18 expmts.; VC15 Prgm.; PAO; GOGU tagup; ULF-2 prepacking; Handovers ISS-18; ODNT/LBNP OBT; IDZ-2 smoke detector mntn.; CMS sampling; IP-1 check.
- *Sat. (10/18):* ISS-18 expmts.; VC15 Prgm.; BMP ch.1 regen.; GANK sampling; IP-1 check; FFQ; Handovers ISS-18; Symbolic Activity; OGS deact.; DOUG review for JEMRMS checkout.
- *Sun. (10/19):* ISS-18 expmts.; VC15 Prgm.; Handovers ISS-18; BMP ch.2 regen.; JEMRMS DOUG review ; JEMRMS activities/checkout ; MBI-15 NEURO; O-OHA assess.; IP-1 check; Elektron BZh check.

ISS Orbit (as of this noon, 12:46pm EDT [= epoch]):
Mean altitude -- 352.7 km
Apogee height -- 355.3 km
Perigee height -- 350.0 km
Period -- 91.59 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0003925
Solar Beta Angle -- -49.9 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 58 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56702

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
10/14/08 -- Soyuz TMA-13/17S dock (FGB nadir port, ~4:33am EDT)
10/23/08 -- Soyuz TMA-12/16S undock (DC1 nadir, 8:15pm) & land (11:36pm) = 10/24 -- 9:36am Kazakhstan)
11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*
11/16/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC (~7:02pm EST) - *U/R*
11/18/08 -- STS-126/Endeavour/ULF2 docking - *U/R*
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.)
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

Soyuz TMA-13/17S launch at Baikonur --- 10/12/08 --- 3:01am EDT

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/11/08
Date:	Saturday, October 11, 2008 1:34:54 PM
Attachments:	

ISS On-Orbit Status 10/11/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – off duty day for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff.*

After yesterday's deferral of the on-orbit Soyuz 16S motion control system (SUD) test due to failure of the Russian BITS2-12 onboard measurement telemetry system (see below), Sergey Volkov & Oleg Kononenko today spent an hour in the TMA-12 Descent Module (SA) supporting the ground-commanded checkout of the SUD, Mode 2/"Docked". *[The test, to prepare for a possible contingency relocation of the spacecraft to the FGB, should 17S be unable to dock at the FGB nadir port on 10/14, and the 16S undocking on 10/23, included pressurization of the KDU Combined Propulsion System Section 2 and Tank 2, a test of the pilot's RUD translational hand controller, and a hot firing of the DPO braking thrusters. KDU maneuver thrusters and DPO lateral thrusters were not fired. For the test, the science windows in the US Lab and Kibo module were shuttered, and station attitude was handed over to Russian thruster control at 4:25am EDT, commanded to free drift at 4:45am, then back to LVLH XVV (Local Vertical Local Horizontal/x-axis in velocity vector) attitude. The one-minute firing started on Daily Orbit 1 at ~4:46am. Attitude control was returned to the U.S. segment (USOS) at 5:40am, and the Lab window could be re-opened at ~8:40am for CEO.]*

FE-2 Chamitoff continued the daily diet monitoring for the SOLO (Sodium Loading in Microgravity) experiment. SOLO runs in two blocks of six days each, with the second having started yesterday. *[For SOLO, Chamitoff follows a special high-salt diet, for which prepared meals are provided onboard. All three daily meals are being logged on sheets stowed in the PCBA Consumable Kit in the MELFI (Minus-Eighty Laboratory Freezer for ISS) along with control solution and cartridges for the PCBA. Blood and urine samples are stowed in the MELFI.]*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste*

products, cleaning of compartments with vacuum cleaner, damp cleaning of the SM (Service Module) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]

As part of the house cleaning, Volkov & Kononenko conducted regular maintenance inspection & cleaning on fan screens in the FGB (TsV2), DC-1 (V3) and SM (VPkhO, VPrK, FS5, FS6 & FS9).

Kononenko later also completed the routine daily servicing of the SOZh system (ECLSS/Environment Control & Life Support System) in the SM, including the periodic checkup on the Russian POTOK-150MK(150 micron) air filter unit of the SOGS air revitalization subsystem, gathering weekly data on total operating time & “On” durations for reporting to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

At ~9:45am EDT the crewmembers conducted their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-Houston and TsUP-Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

The two cosmonauts had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Oleg at ~7:15am, Sergey at ~8:50am.

At ~8:18am, Chamitoff conducted a test pass of the onboard ham radio station with an ARISS (Amateur Radio on ISS) ground station, preceded by a 15-min telecon on S-band.

At ~12:05pm EDT, Gregory powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, & power supply) and conducted, at 12:10am, a ham radio exchange with the Colombia Mission Project at Buchanan High School, Clovis, CA. The COLUMBIA Mission began three years ago as a classroom project to introduce students to the magnificent accomplishments of space exploration. Due to its popularity with the broad student population, it is now an on-campus club. Each year the Project creates, and continues to evolve, a space station/planetary exploration simulation and ENDEAVOUR to excite, educate, and illuminate young minds to the staggering

tasks undertaken by NASA. Each year, approximately 100 students organize themselves into an administrative structure of committees and subcommittees with the shared goal of "launching" our chosen astronauts into space for a two day mission aboard our mock space station. Questions were uplinked to Greg beforehand. *["Do you notice that your body composition changes over the course of the mission? If so, what training will you do to return it to normal?"; "What has been your favorite moment during your time on the ISS? Do you receive up-to-date entertainment, such as TV episodes or movies on the ISS?"; "Have you been able to follow the presidential campaign?"; "Since we last spoke, have you been able to spot any new locations on earth that you were interested in observing?"; "Has being in space affected your dream patterns?"; "What food items on earth do you miss the most?"; "Were you able to see Hurricane Ike form over the Caribbean a few weeks ago? From your view, were you able to observe how devastating it was?"; "What is the most interesting task you've performed this week?"; "What will you miss most about your time on the ISS? We know that you are unable to bathe in a conventional manner. How do you maintain your personal hygiene while on the Space Station?"; "What was either the most gruesome, or the funniest aspect of astronaut training?"]*

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR/2.5h, FE-1/2.5h), and RED resistive exercise device (FE-2).

Later, the FE-1 will transfer the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Working off the discretionary "time permitting" task list, CDR Volkov ran another session for Russia's Environmental Safety Agency (EKON), making observations and taking KPT-3 aerial photography with the NIKON D2X camera of environmental conditions in Russia. *[Today's target was the Plymouth area.]*

As generally every day now, today starting at 9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) is running intermittently for two half-cycles to control $ppCO_2$ levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

An activity to upgrade SSC (Station Support Computer) laptops to Wireless

capability (by installing wireless cards and modifying software) has been added to Chamitoff's discretionary "job jar" task list.

BITS Failure: Overnight on 10/9-10, the Russian BITS2-12 onboard telemetry measurement system failed, resulting in a shutdown of RS (Russian Segment) SOZh/ECLSS equipment. As per program, this caused a Low Pressure alarm and a transition of the station to Survival Mode at 2:02am EDT (yesterday morning) and load shedding (power down of selected systems). Attitude control was automatically handed over to the RS while the US CMGs (Control Moment Gyroscopes) also briefly remained in control until MCC-H flight controllers commanded the USOS (US On-orbit Segment) to free drift to avoid a "force fight" between the control systems, allowing RS to take full attitude control. ISS attitude control never was lost, and RS thrusters maintained control for approximately 4 hours, expending about 44 kg of propellants. USOS systems were recovered, and the ground commanded attitude control handover to CMG Momentum Management, while TsUP-Moscow switched to the BITS backup system and recovered telemetry. All RS ECLSS were recovered. The actual source of the BITS failure is still under investigation.

MFCV Adjustments Update: FE-2 Chamitoff yesterday completed the fourth and last MTL MFCV (Moderate Temperature Loop/Manual Flow Control Valve) adjustment in preparation for Flight ULF-2, using the Non-Intrusive Flow Meter in the Lab Aft Endcone to adjust the MFCV to the desired flow reading of 79 kg/hr. Because of another zero-calibration required for the Flow Meter, the adjustment activity took longer than expected, and the also planned Node-1 MTL RFCA (Rack Flow Control Assembly) measurement task could not be performed. The BOB (Breakout Box)/Flow Meter setup was left intact, but the remaining task has not yet been rescheduled.

Soyuz TMA-13/17S Launch Update: The launch of Soyuz TMA-13/17S to the ISS is planned for tomorrow morning at 3:01:29 am EDT (11:01am Moscow time).

17S Flight Plan Overview:

- Flight Day 1:
    - Launch to Orbit, ~9 min in duration; auto deployment of solar arrays & antennas; pressurization of prop tanks and filling of Soyuz manifolds; docking probe extended; leak check by crew of BO & SA modules; KURS self tests; test of BDUS angular rate sensors; attitude established (OSK/LVLH); crew opens BO-SA hatch, ingresses BO and doffs Sokol suits; test of RUO rotational hand controller; Soyuz put in ISK (sun spuinning/«barbecue») mode; data for DV1 & DV2 burns uplinked; SOA air purification system activated in BO and deactivated in SA; DV1 burn; DV2 burn; Soyuz back in ISK

attitude; crew clean & dry Sokols; crew sleep.

- Flight Day 2
  - Post-sleep activities; BO workstation prepared; data for DV3 burn uplinked; crew tests RUO-2 & RUD-2 rotational and translational hand controllers; DV3 attitude established by crew; DV3 burn executed; Soyuz back in ISK attitude; crew swaps CO2 filters in BO; crew sleep.
- Flight Day 3
  - Post-sleep activities; KURS-A heaters activated; data for automated rendezvous uplinked; crew dons Sokols; SOA deactivated in BO and activated in SA; crew ingresses SA, closes BO-SA hatch and dons harnesses for docking; DV5 burn; automated rendezvous & docking via KURS-P in ISS and KURS-A in Soyuz; docking; pressure equalized between Soyuz and ISS ; crew transfers.

Weekly Science Update *(Expedition Seventeen -- Week 25)*

3-D SPACE: In progress.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Measurements continue in FGB module.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3/4 (Binary Colloidal Alloy Test 3/4): “”Greg, thank you for setting up the BCAT-4 experiment. We’re looking forward to seeing your experiment sample photographs when they are downlinked.”

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-2/CGBA-5 (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus 5): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): Due to safety concerns identified for the PLEGPAY instrument (when operated in Plasma Discharge mode), the entire EuTEF platform was put in survival mode on 9/1 at around 11:00am EDT (just prior to 29P undocking). Since then, the EuTEF power feeder#1 has been de-activated and no science acquisition is possible. Request has been approved for intermittent activation for 3 of the 9 EUTEF payloads. EuTEF platform power feeder#1 has been re-activated for 8-hrs periods on 10/4, 10/6 and 10/8. This activation protocol wioll continue every other day until safety issues are solved with the PLEGPAY instrument. This only mitigates the science loss for the EXPOSE, DOSTEL and MEDET instruments. -- DEBIE-2: Inactive;-- DOSTEL: Inactive, part of proposed intermittent activation;-- EuTEMP: Inactive;-- EVC: Inactive;-- EXPOSE: Inactive, part of proposed intermittent activation;-- FIPEX: Inactive; -- MEDET: Inactive, part of proposed intermittent activation; -- PLEGPAY: Inactive;-- TRIBOLAB: Inactive.

FSL (Fluid Science Laboratory): FSL is nominal.

GEOFLOW: In progress.

HDTV System Test DL (JAXA): In progress.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): In progress.

Marangoni Experiment for ISS (JAXA Fluid Physics Experiment Facility): Run #4 completed. However, because of the liquid bridge separation, the parameters of the 4th run were changed.

Micro-G Clay (JAXA EPO): Complete.

MISSE (Materials ISS Experiment): Ongoing.

Moon Photography from ISS (JAXA EPO): Complete.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-1/-2 (Nitric Oxide Analyzer, ESA): Complete.

NUTRITION w/REPOSITORY: In progress.

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PCRF (Protein Crystallization Research Facility) Reconfiguration (JAXA): Complete.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): Complete.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): In progress.

SOLAR (Solar Monitoring Observatory): The last Sun visibility window ended on 10/4. The instruments operated nominally, with the exception of SOLACES which encountered a synchronization problem for its two mcro-controllers units. - SOVIM: acquiring science until 10/4; since idle;- SOLSPEC: acquiring science until 10/4; since idle; -- <u>SOLACES</u>: instrument powered on and troubleshooting is ongoing, on

the micro-controllers synchronization problems.

SOLO (Sodium Loading in Microgravity): The first SOLO session started on 10/3, and it consists of 2 blocks, ending on the 17S docking day 10/14. The first block started on 10/3 and finished on 10/8 and included a normal sodium diet for the crewmember. For the first block the crewmember performed 2 body mass measurements (10/6 and 10/8), urine collection (from 10/7 to 10/8) and blood (PCBA) and 18ml SERUM + EDTA plasma) collection (10/7). These operations will be repeated during the second block which is with a low sodium diet of 5 days. The ground teams have seen spikes in the delta pressure water loop for both HRF racks during activation, deactivation and the setting of flow cases. ESA and NASA teams are currently assessing a work-around plan to allow for the operation of the racks for the second block of SOLO started on 10/9.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): Reserve.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): Completed.

CEO (Crew Earth Observations): Through 10/1 the ground has received a total of 8,210 frames of CEO images for review and cataloging. Photos with times corresponding to CEO target request times are reviewed first and since last week's report included: South Tibesti Megafan, Chad (a) (some of the area was acquired, but dust clouds obscured most of it); Post-Ike Survey, Upper Texas Coast (some useful imagery was acquired, but there were focus issues); B.P. Structure, Libya (several useful context views acquired, two including Oasis Impact Crater as well); South Tibesti Megafans, Chad (b) (target acquired, but dust clouds present again); and Sevilleta Wild Life Refuge, New Mexico (target not acquired). "Your recent fine view of Sandy Cape, Fraser Island, Australia will be published on NASA/GSFC's Earth Observatory website this weekend. Your image of northern end of the world's largest sand Island, located off the coast of Queensland offers an excellent illustration of the geologic processes related to sand dune formation. Great shot!"

CEO photo targets uplinked for today were **Tenoumer Impact Crater** *(this tiny 1.9km-diameter impact crater is located in the desert interior of northern Mauritania. Despite its small size, the crater is geologically fresh [just over 20,000*

years old] and relatively unweathered in its desert setting. Researchers are seeking a few detailed, near-nadir views of this feature. ISS had a mid-morning track with clear weather anticipated. As ISS trackded northeastward from the Mauritanian coast, Greg was to note the large, well-photographed Richat Structure to the right of track and then begin looking only seconds later for Tenoumer just right of track), **Caracas, Venezuela** *(the Venezuelan capital city is situated in a narrow valley, just inland from the Caribbean Sea coast south of a forested mountain range. Trying for detailed near-nadir views of the city as ISS approached from the SW in mid-morning light with possibly partly cloudy conditions),* **Hubbard Brook, New Hampshire** *(this small Long Term Ecological Reseach [LTER] site, located in northwestern New Hampshire, is one of several in the New England region that researchers have been attempting to acquire. Although most of these targets were well right of track on this early afternoon pass, this may have been some of the best weather conditions in months and just prior to winter snows. Looking right of track and trying for oblique, contextual views of the area roughly between Albany, New York and Quebec, Canada using the short lens settings),* and **Niwot Ridge Tundra, Colorado** *(ISS had a near-nadir view of this target area in late morning with generally fair weather anticipated. This LTER site is located in north-central Colorado within the alpine areas above 3,000m just west of Boulder. As the station tracked northeastward over the Colorado Rockies, before it reached the plains to the E, Greg was to try for contextual mapping of the ridge and its surroundings)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

Week 25 Scheduled Main Activities:

- Sun. (10/12): Soyuz TMA-13/17S launch; SOLO #2; PFC; VRU disk exchange.

ISS Orbit (as of this morning, 5:57am EDT [= epoch]):
Mean altitude -- 352.7 km
Apogee height -- 355.4 km
Perigee height -- 350.0 km
Period -- 91.59 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0004014
Solar Beta Angle -- -45.9 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 38 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56682

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

10/12/08 -- Soyuz TMA-13/17S launch (3:01:29 am EDT; Fincke, Lonchakov, Garriott)
10/14/08 -- Soyuz TMA-13/17S dock (FGB nadir port, ~4:33am EDT)
10/23/08 -- Soyuz TMA-12/16S undock (DC1 nadir, 8:15pm) & land (11:36pm) = 10/24 -- 9:36am Kazakhstan)
11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*
11/16/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC (~7:02pm EST) - *U/R*
11/18/08 -- STS-126/Endeavour/ULF2 docking - *U/R*
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.)
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/10/08
Date:	Friday, October 10, 2008 1:22:34 PM
Attachments:	image001.jpg

ISS On-Orbit Status 10/10/08

All ISS systems continue to function nominally, except those noted previously or below.

Upon wakeup, CDR Volkov terminated his twelfth SONOKARD experiment session for the long-term Russian sleep study MBI-12, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

FE-2 Chamitoff continued the daily diet monitoring for the SOLO (Sodium Loading in Microgravity) experiment. SOLO runs in two blocks of six days each, with the second having started yesterday. *[For SOLO, Chamitoff follows a special high-salt diet, for which prepared meals are provided onboard. All three daily meals are being logged on sheets stowed in the PCBA Consumable Kit in the MELFI (Minus-Eighty Laboratory Freezer for ISS) along with control solution and cartridges for the PCBA. Blood and urine samples are stowed in the MELFI.]*

The three crewmembers began their workday before breakfast with the periodic session of the Russian biomedical routine assessment PZEh-MO-8/Body Mass Measurement, using the IM mass measurement device which Oleg Kononenko broke down afterwards for stowage. *[For determining body mass in zero-G, where things are weightless but not massless, the Russian IM "scales" measure the inertial forces that arise during the oscillatory motion of a mass driven by two helical metering springs with known spring constants. By measuring the time period of each oscillation of the unknown mass (the crewmember) and comparing it to the period of a known mass, the crewmember's mass is calculated by the computer and displayed.]*

For their departure on 10/23, Sergey Volkov and Oleg Kononenko spent an hour in the Soyuz TMA-12/16S Descent Module (SA) supporting a ground-commanded checkout of the Soyuz motion control system (SUD, Mode 2/"Docked") which included pressurization of the KDU Combined Propulsion System Section 2 and Tank 2, a test of the pilot's RUD translational hand controller, and a hot firing of the DPO braking thrusters. KDU maneuver thrusters and DPO lateral thrusters were not fired. *[For the test, the science windows in the US Lab and Kibo module were shuttered, and station attitude was handed over to Russian thruster control at 4:00am EDT, commanded to free drift at 4:20am, then back to LVLH XVV (Local Vertical Local Horizontal/x-axis in velocity vector) attitude. The one-minute firing started on Daily Orbit 1 at ~4:25am. Attitude control was returned*

to the U.S. segment (USOS) at 5:15am, and the Lab window could be re-opened at ~8:15am for CEO.]

Afterwards, Sergey & Oleg also had two hours set aside to conduct the Soyuz descent training exercise, standard procedure for each returning cosmonaut crew. The exercise, which does not involve any command activation, uses computer simulation on the RSK1 laptop with a descent hand controller (RUS) to set up reentry conditions and switch between modes. It was supported by a tagup and discussions with a ground instructor at TsUP/Moscow via S-band. *[The onboard training (OBT) session included a review of the pertinent RODF (Russian Operations Data Files), specifically the books on Soyuz Insertion & Descent Procedures, Emergency Descents, and Off-Nominal Situation Procedures such as manual undocking. Nominal return of Soyuz 16, with Volkov, Kononenko and the US SFP (Spaceflight Participant) Garriott, is scheduled for 10/23.]*

The CDR completed the periodic collection of air samples in the SM (Service Module) & FGB using the AK-1M sampler kit, recording date, time & location. Kits and pouches were then restowed.

FE-2 Chamitoff set up the freshly (10/8) checked-out Shuttle BOB (Breakout Box) to use the Ku-band power supply for operating the Non-Intrusive Flow Meter, then conducted the flow rate adjustment for the MFCV (Manual Flow Control Valve) in the Lab Aft Endcone. Later, after lunch, Gregory also used the Flow Meter for conducting a flow rate test of the RFCA (Rack Flow Control Assembly) in Node-1, before disconnecting the Flow Meter and re-stowing all the hardware. *[Purpose of these valve adjustments is to optimize the ITCS (Internal Thermal Control System) flow throughout the USOS to allow for the incorporation of the Regenerative ECLSS, to be launched on the ULF2 mission. BOB was used in lieu of the Flow Meter batteries which had not charged properly.]*

FE-1 Kononenko meanwhile used the vacuum cleaner plus other tools to perform the periodic USOS hatch seal inspection (Node-1 Forward, Aft & Starboard, Lab Aft & Forward, Node-2 Aft, Starboard & Port, Airlock, Columbus, Kibo JPM Zenith & Starboard, Kibo JLP Nadir) in support of ACS (Atmospheric Control System) maintenance (last time done: 7/8).

CDR Volkov took trial photography of the damaged radiator on the S1 truss. *[The S1 photos, with a 400mm-lens, from SM window 2 and the Soyuz 16S "blister" window are to include all three S1 radiators. Photos are also to be taken of the three P1 radiators, from SM window 12. The damage is on the 7th panel of the S1-3 radiator, primarily on the nadir side and there is also some buckling on the zenith side of the panel. The trial photography has the purpose of assessing the ability to stage future photography with TRRJ (Thermal Radiator Rotary Joint) rotation and possible Russian solar array re-positioning.]*

Later, after Chamitoff configured the designated A31p laptop in the FGB for converting analog-to-digital video, he and Volkov set up the system for a video transmission test from the SONY HVR-Z1J digital high-definition camcorder and the ZVK LIV Experimental Video Complex in the SM over the MPEG-2 (Moving Pictures Expert Group 2) encoder to downlink via U.S. OpsLAN and Ku-band in "streaming video" packets. After the test, with the RSCE PingMaster application, Gregory deactivated the A31p again. *[Volkov's setup involves the KL-211 MPEG-2 Encoder which uses the RSS1 A31p laptop (for monitoring the digital video) and a U.S. SSC (Station Support Computer) laptop (for converting analog TV from Russian PAL mode to U.S. NTSC) and making the video hardware connections, checked with a network ping test. Transmission tests with the ground followed (12:50pm – 1:20pm EDT). The digital video transmission is carried over JSL(Joint Station LAN)/Ethernet plus OCA/Ku-Band to MCC-Houston and from there to Moscow via the ESA*

Gateway for COL-CC/Oberpfaffenhofen transmission to TsUP-Moscow, plus transfer of the USOS analog video of the RS ISS video downlink via Streambox 2 to NISN (i.e., the Moscow Ostankino communication hub).]

Oleg did another run of the Russian DZZ-2 "Diatomeya" ocean observation program, using the NIKON-F5 DCS digital still camera to shoot color contrast formations and wind-induced wave anomalies (foam bands, smooth-out sections) in sea water at specified times. *[The current DZZ-2 sessions are in support of a multi-discipline scientific expedition of the Institute of Oceanic Studies under the Russian Academy of Science, chief developer of the Diatomeya space experiment, which will be operating in the first ten days of October in the NE part of the Black Sea. Water areas with the most pronounced hydro-physical and hydro-biological characteristics are selected to be measured from the sea vessel. In good weather these water areas can be easily observed from space in colored and bright fields.]*

Greg completed the visual “T+2 Day” microbial (bacterial & fungal) analysis of the Week 25 potable water samples, collected on 10/8 from the SRV-K hot tap and two CWC (Contingency Water Containers) specimens and processed on board with the MCDs (Microbial Capture Devices) and coliform detection bags.

Chamitoff also filled out the regular FFQ (Food Frequency Questionnaire), his 15th, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

The two cosmonauts again had a one-hour period each to themselves for the regular crew departure preparations, working on the standard end-of-increment cleanup preparatory to their return to Earth later this month. *[It is usual for Russian crewmembers to be granted reduced workdays for making their departure preparations, as their return date approaches.]*

Gregory conducted the regular bi-monthly reboots of the OCA Router and File Server SSC (Station Support Computer) laptops.

Chamitoff is timelined for another VolSci (Voluntary Science) program “installment” with the BCAT-4 (Binary Colloid Alloy Test 4) experiment tonight, completing the hardware set-up in the Lab Avionics Racks 2 & 3 seat track area (no MWA/Maintenance Work Area table), along with camcorder and still camera,- to take photograph sample 3) and then initiate homogenization and the automated picture taking. *[The SGSM (slow growth sample module) was to be configured by mixing the samples 8, 9, 10, and 3 and starting automated photography with the Kodak DCS-760 digital still camera controlled by the EarthKAM software running on an SSC (Station Support Computer), automatically taking one photo every hour of sample 3 for the next six days.]*

Sergey performed the regular daily maintenance servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The daily job of IMS (Inventory Management System) maintenance was listed for Kononenko on the discretionary "time permitting" task list, involving updating/editing of its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR/2.5h, FE-1/2.5h), and RED resistive exercise device (FE-2).

Later, the CDR will transfer the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Around ~2:30pm, the FE-2 is scheduled to take measurements for the regular atmospheric status check for ppCO_2 (Carbon Dioxide partial pressure) in the Lab, SM at panel 449 and COL (Columbus Orbital Laboratory) plus battery ticks, using the hand-held CDMK (CO_2 Monitoring Kit, #1002). The unit will then deactivated and returned to its stowage location (LAB1S2). *[Purpose of the 5-min activity is to trend with MCA (Major Constituents Analyzer), i.e., to correlate the hand-held readings with MCA measurements. As usual, the results will be logged in the OSTPV (Onboard Short Term Plan Viewer) and are immediately available to the ground.]*

At ~4:35am EDT, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~2:55pm, the crewmembers will convene for their standard bi-weekly teleconference with the JSC Astronaut Office (Steve Lindsey), via S-band S/G-2 audio & phone patch.

At ~6:15pm, Greg Chamitoff will have his weekly PFC (Private Family Conference) via S-band/ audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

As generally every day now, today starting at 9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) is running intermittently for two half-cycles to control ppCO_2 levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

WRM Update: An updated WRM (Water Recovery Management) "cue card" was uplinked overnight for the crew's reference, updated with yesterday's water audit. *[The new card (17-1016C) lists 28 CWCs (~911.2 L total) for the four types of water identified on board: technical water (263.2 L, for Elektron electrolysis, except for 22.2 L off-limit because of* Wautersia *bacteria), potable water (627.6 L, incl. 174.6 L currently on hold), condensate water (3.4 L), waste/EMU dump and other (17 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

Soyuz TMA-13/17S Launch Update: This morning in Baikonur/Kazakhstan, the Soyuz 17 spacecraft was rolled out from the Assembly-Test Facility to the launch site and erected on the launch pad. L-2 operations are underway. The launch of the Soyuz-FG integrated launch vehicle

with the Soyuz TMA-13 spacecraft to the ISS is planned for 10/12 at 3:01:29 am EDT (11:01am Moscow time). ***[See picture, below]***

Week 25 Scheduled Main Activities:

- Sat. (10/11): Station cleaning; PFCs; Ham radio call; SOLO #2.
- Sun. (10/12): SOLO #2; PFC; VRU disk exchange.

CEO (Crew Earth Observations) photo targets uplinked for today were **Arkenu 1 and Arkenu 2 Impact Craters** *(Arkenu 1 & 2 are a rarely exposed double impact structure created by a 500 m diameter pair of asteroids. Located in southeastern part of the Libyan Desert, Arkenu 1 is 6.8 km in diameter and Arkenu 2 is 10 km. Both have been dated as less than 140 million years old. Detailed images of the structures of both craters were requested),* **Teide Volcano, Tenerife Island, Canary Islands** *(the large triangular island of Tenerife is composed of a complex of overlapping volcanoes that have remained active into historical time. The United Nations Committee for Disaster Mitigation has designated Teide as a Decade Volcano. It is considered to be the 13th most dangerous volcano in the world due to its proximity to several major towns and the nearby city of Puerto de la Cruz),* **Hurricane Norbert** *(Dynamic Event: Hurricane Norbert. Looking right of track at Category 3 storm with a distinct eye. Norbert is expected to cross the lower Baja late Friday),* **Madrean Sky Islands** *(the Madrean Sky Islands are patches of forest near the summits of the high mountains of the southwestern USA and northwestern Mexico. These forests are remnants of much more extensive vegetation that once existed at lower elevations in cooler and wetter climates. Looking left of track into southeastern Arizona and southwestern New Mexico for the dark forested patches. Context views were requested),* and **Konza Prairie, Kansas** *(the Konza Prairie is one of the Long Term Ecological Research [LTER] sites. This target is located in the Flint Hills of northeastern Kansas. The vegetation is primarily native tall grass prairie. CEO imagery will help in the study of the effects of fire, grazing and climate variability as well as help to document the grassland ecosystems. Overlapping mapping pass was requested)*.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 7:21am EDT [= epoch]):
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05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

Soyuz-FG with TMA-13/17S spacecraft on Pad 1 (10/10/08).

From: vonPuttkamer, Jesco H. (HQ-CJ000)

To: Von Puttkamer, Jesco H. (HQ-CE010);

CC:

Subject: ISS On-Orbit Status 10/09/08

Date: Thursday, October 09, 2008 1:59:56 PM

Attachments:

ISS On-Orbit Status 10/09/08

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FE-2 Chamitoff continued the daily diet monitoring for the SOLO (Sodium Loading in Microgravity) experiment. SOLO runs in two blocks of six days each, with the second starting today. *[For the SOLO experiment, Chamitoff follows a special high-salt diet, for which prepared meals are provided onboard. All three daily meals are being logged on sheets stowed in the PCBA Consumable Kit in the MELFI (Minus-Eighty Laboratory Freezer for ISS) along with control solution and cartridges for the PCBA. Blood and urine samples are stowed in the MELFI.]*

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The two Russian crewmembers had their second preliminary training session with the Russian "Chibis" LBNP suit (lower body negative pressure; Russian: ODNT), ramping up to get them ready for returning to gravity on 10/24. Assisting each other in turn as CMO (Crew Medical Officer), the subjects were supported in their two one-hour sessions by ground specialist tagup via VHF at 5:20am (DO16) & 6:50am EDT (DO1). *[The assessment uses the Gamma-1 ECG equipment with biomed harness, skin electrodes and a blood pressure and rheoplethysmograph cuff wired*

to the cycle ergometer's instrumentation panels. The Chibis ODNT provides gravity-simulating stress to the body's cardiovascular/circulatory system for evaluation of Volkov's and Kononenko's orthostatic tolerance (e.g., the Gauer-Henry reflex) after several months in zero-G. The preparatory training generally consists of first imbibing 150-200 milliliters of water or juice, followed by two cycles of a sequence of progressive regimes of reduced ("negative") pressure, set today at -15, -20, -25, and -30 mmHg (Torr) for five min. each while shifting from foot to foot at 10-12 steps per minute, wearing a sphygmomanometer to measure blood pressure. The body's circulatory system interprets the pressure differential between upper and lower body as a gravity-like force pulling the blood (and other liquids) down. Chibis data and biomed cardiovascular readings are recorded. The Chibis suit (not to be confused with the Russian "Pinguin" suit for spring-loaded body compression, or the "Kentavr" anti-g suit worn during reentry) is similar to the U.S. LBNP facility (not a suit) used for the first time on Skylab in 1973/74, although it appears to accomplish its purpose more quickly.]

The CDR worked on the BRPK air/liquid separator of the SRVK-2M condensate water processor, replacing two A-B hoses and using water from an EDV container and a pump to test the impact of a possibly clogged A-N hose hydro-connector on the separator's service life.

The FE-1 meanwhile completed the monthly radiation data checkup for accumulated flux & dose rate data with the Matryoshka-R radiation payload (RBO-3-2) and its LULIN-5 electronics box. Afterwards, Kononenko also conducted the periodic data transfer and time synchronization between the RSS1 laptop and the BSPN payload server for transfer of accumulated Matryoshka data from the BSPN, to be downlinked on OCA comm (via the Russian RSS1 laptop to a PCMCIA flash card). *[Before RSS1/BSPN synchronization, the RSS1 is updated with the exact time as per the station clock (which in turn is synchronized daily from RGS/Russian Ground Site). Experiment control application is a payload file transfer program called ShellForKE.]*

After yesterday's preparations for today's rack relocation, Greg Chamitoff, assisted by the CDR, moved the last three racks from their original positions to their final locations, preceded by clearing obstructing equipment items from the rack fronts, the destination bays and the transfer "corridor". The relocations also required the temporary relocation of the Lab & Cupola RWS (Robotic Work Station) laptops, which were subsequently restored, and some reconfigurations in the JAXA Kibo module. For the outfitting, the following rack transfers were complete:

- One ZSR (Zero-G Stowage Rack) from the US Lab (position O5) to the JPM (JEM Pressurized Module, pos. F6),
- one ZSR from the Node-2 (pos. D5) to the JLP (JEM Pressurized Logistics Segment, pos. A2), and

- one RSR (Resupply Stowage Rack) from Node-2 (pos. P5) to the US Lab (pos. O5).

Preparatory to the return flight of the Soyuz TMA-12/16S vehicle, docked at the DC1 nadir port, Volkov performed the periodic cleaning of the screen of the BVN air heater fan assembly in the spacecraft's Orbital Module (BO).

For the Russian BTKh-11 BIODEGRADATSIYA ("Biodegradation") experiment, Oleg collected surface samples from specific equipment and structures in the Service Module (SM) for subsequent stowage in the TMA-12 Descent Module for microbial analysis on Earth. *[The activities, supported by ground specialist tagup via S-band, were documented with the Nikon D1X digital camera with SB 28DX flash attachment for downlink via OCA.]*

Sergey conducted the periodic checkout/verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the passageways SM PrK (Transfer Compartment)–SM RO (Working Compartment), SM PkhO (Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1, and skipping the Soyuz hatch today.

Gregory completed the weekly 10-min. CWC (Contingency Water Container) inventory as part of on-going WRM (Water Recovery & Management) assessment of onboard water supplies. Updated "cue cards" based on the crew's water calldowns are sent up every other week. *[The new card (17-1016B) lists 29 CWCs (~962.3 L total) for the four types of water identified on board: technical water (283.2 L, for Elektron electrolysis, except for 22.2 L off-limit because of* Wautersia *bacteria), potable water (627.6 L, incl. 174.6 L currently on hold), condensate water (34.5 L), waste/EMU dump and other (17 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

For another VolSci (Voluntary Science) program session later tonight, Greg set up the BCAT-4 (Binary Colloid Alloy Test 4) experiment in the Lab Avionics Racks 2 & 3 seat track area (no MWA/Maintenance Work Area table), along with camcorder and still camera,- to take video and photos of Greg's subsequent sample homogenization plus the last sample (#3), and then initiated the activity. *[The FE-2 configured the SGSM (slow growth sample module) by mixing the samples 8, 9, 10, and 3 and starting automated photography of sample 3 with the Kodak DCS-760 digital still camera controlled by the EarthKAM software running on an SSC (Station Support Computer), automatically taking one photo every hour of sample 3 for the next six days.]*

The FE-2 verified closure of the protective window shutters in the Lab and Kibo

module, preparatory to tomorrow morning's Soyuz 16S thruster/SUDN testing at ~4:25am EDT, for which the ISS will briefly go into free drift (so jet thrust can be measured).

The two cosmonauts also had a 50-min period each to themselves for the regular crew departure preparations, working on the standard end-of-increment cleanup preparatory to their return to Earth later this month. *[It is usual for Russian crewmembers to be granted reduced workdays for making their departure preparations, as their return date approaches.]*

The regular daily maintenance servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM today was listed for Volkov on the discretionary "time permitting" task list. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

For Kononenko the job list suggested, at his discretion, the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

At ~12:50pm, CDR Volkov conducted a ham radio session with school children from Montreal, Canada.

Greg Chamitoff, an accomplished chess player who has been winning matches with Flight Control Center personnel around the world, at ~2:05pm EDT engaged in a PAO TV event with the Stevenson Elementary School Chess Team at Bellevue Community College in Bellevue, Washington, for about 20 minutes of air time.

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), and RED resistive exercise device (FE-2). Part of Sergey's & Oleg's exercise regimen was contributed by their one-hour ODNT sessions.

Later, the CDR transfers the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

As generally every day now, today starting at 9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) is running intermittently for two half-

cycles to control $ppCO_2$ levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

Shuttle BOB Update: Greg's Breakout Box troubleshooting yesterday was successful and cleared the BOB for tomorrow's Flow Meter operations. *[During the checkout, the installation of a ground wire caused a blown fuse, but it showed voltage readings that indicate that the BOB will function correctly and safely. Additionally, with newly added Kapton tape insulation on the Flow Meter transducer's metal surface there will be no more sparking to the ISS structure in case of contact.]*

16S Docking Contingency Planning: RSC-Energia has developed a "just in case" contingency plan for the very unlikely event that the Soyuz 16S, currently docked at the DC1 nadir port, must relocate to the FGB to make room for Soyuz TMA-13/17S, should the latter be prevented from nominal docking at the FGB (as would be the case if the KURS antenna fails to retract). *[FGB docking is not allowed for Soyuz/ Progress docking with unretracted KURS antenna.]*

GNC MDM Update: Both GNC MDM (Guidance, Navigation & Control Multiplexer/ Demultiplexer) computers appear stable with no failures in 13 days. Remaining steps for completion of X2R7 software transition, including stepping up the C&C-3 (Command & Control) MDM 3 to R7 will be performed. *[Proposed on-orbit testing to incorporate GPS (Global Positioning System) satellite data into GNC MDM to attempt to recreate the recent failure will be deferred until after 16S undock.]*

V*ozdukh Failures:* The Russian Vozdukh CO2 removal system has had repeated failures, believed to be due to microswitches. The system is currently restarted after each failure. Troubleshooting plan is in work.

RGA Failures: Two US RGAs (Rate Gyroscope Assemblies) failed due to a skewed FDIR (Fault Detection, Isolation & Recovery) system software file. *[This type of failure has been seen in the past with a single RGA but not both. Both RGAs were successfully recovered after the skewed FDIRs were disabled. This configuration does not violate any Flight Rules.]*

Week 24/25 Scheduled Main Activities:

- Fri. (10/10): Soyuz 16S thruster/SUDN test; MO-8; MBI-12 dwld.; FFQ; ITCS MFCV adjust; RS Video MPEG config.; Water T+2 anal.; SOLO #2; CDMK check.
- Sat. (10/11): Station cleaning; PFCs; Ham radio call; SOLO #2.

- Sun. (10/12): SOLO #2; PFC; VRU disk exchange.

CEO (Crew Earth Observations) photo targets uplinked for today were **Tenoumer Impact Crater** *(this tiny, 1.9km-diameter impact crater is located in the desert interior of northern Mauritania. Despite its small size, the crater is geologically fresh [just over 20,000 years old] and relatively unweathered in its desert setting. CEO researchers are seeking detailed, near-nadir views of this feature. Greg had a mid-morning track with clear weather anticipated. As ISS tracked NE-ward from the Mauritanian coast, he was to note the large, well-photographed Richat Structure and begin looking only seconds later for Tenoumer just left of track),* **London, England, Great Britain** *(on this early afternoon pass, ISS had a rare break in the typical fall weather pattern over the British Isles, with a near-nadir view of this renowned mega-city in relatively fair weather. As the station approached England from the W, Greg was to look just inland from the southern coast and use the long-lens settings for a detailed mapping of the urban margins),* and **Niwot Ridge Tundra, Colorado** *(nadir view of this target area in late morning with clear weather anticipated. This Long Term Ecological Research [LTER] site is located in north-central Colorado within the alpine areas above 3,000m just west of Boulder. As ISS tracked NE-ward over the Colorado Rockies, before reaching the plains to the E, Greg was to try for contextual mapping of the ridge and its surroundings)*.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 6:53am EDT [= epoch]):
Mean altitude -- 352.8 km
Apogee height -- 355.5 km
Perigee height -- 350.1 km
Period -- 91.60 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0004029
Solar Beta Angle -- -37.2 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 64 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56636

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
10/10/08 -- Soyuz 16S thruster test
10/12/08 -- Soyuz TMA-13/17S launch (~3:01:29 am EDT; Fincke, Lonchakov, Garriott)
10/14/08 -- Soyuz TMA-13/17S dock (FGB nadir port, ~4:33am EDT)

10/23/08 -- Soyuz TMA-12/16S undock (DC1 nadir, 8:15pm) & land (11:36pm) = 10/24 -- 9:36am Kazakhstan)
11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*
11/16/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC (~7:02pm EST) - *U/R*
11/18/08 -- STS-126/Endeavour/ULF2 docking - *U/R*
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.)
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/08/08
Date:	Wednesday, October 08, 2008 2:12:06 PM
Attachments:	

ISS On-Orbit Status 10/08/08

All ISS systems continue to function nominally, except those noted previously or below.

FE-2 Chamitoff had the last day of his first SOLO (Sodium Loading in Microgravity) session, which runs in two blocks of six days each. Greg finished up with measuring body mass (with SLAMMD/Space Linear Acceleration Mass Measurement Device), and sampling of blood (with PCBA/Portable Clinical Blood Analyzer) and urine, begun 10/5. Then, the equipment was stowed for now. *[For the SOLO experiment, Chamitoff follows a special high-salt diet, for which prepared meals are provided onboard. All three daily meals are being logged on sheets stowed in the PCBA Consumable Kit in the MELFI (Minus-Eighty Laboratory Freezer for ISS) along with control solution and cartridges for the PCBA. Blood and urine samples are stowed in the MELFI.]*

FE-1 Kononenko completed his first session of the 24-hour of ECG (electrocardiogram) recording under the Russian MedOps MO-2 protocol. *[For the ECG recording, the Russian flight engineer yesterday donned the five-electrode Holter harness which read his dynamic (in motion) heart function from two leads over 24 hours and recorded data on the Kardioregistrator 90205 unit. CDR Volkov's MO-2 session took place the day before.]*

Afterwards, the FE-1 collected the periodic readings of potentially harmful atmospheric contaminants in the SM (Service Module), using the CMS (Countermeasure System), a component of the SKDS GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, today using preprogrammed microchips to measure for Isopropanol ("rubbing alcohol", C_3H_8O), Methanol ("wood alcohol", CH_3OH) and Toluene (methylbenzene, C_7H_8).

FE-2 Chamitoff conducted "Exp-17 Week 25" sampling of potable water for chemical and microbial analysis from the SVO-ZV tap and the SRV-K Warm tap,

the latter after preliminary heating of the water (three heating cycles) and flushing. *[Gregory collected three 225 mL samples (for inflight microbial analysis) and two 750 mL samples (for postflight chemical analysis) from each of three ports (SRV-K hot, SRV-K warm, SVO-ZV) for return on STS-126/ULF2. The flush water, collected in three small waste water bags, was then reclaimed for technical use. For the in-flight chemistry/microbiology analysis, Greg used MCDs (microbial capture devices) from the U.S. WMK (water microbiology kit) for treatment/ processing after no more than 6 hours of the collection (done ~10:55am EDT). Sample analysis included subsequent processing of water samples in the MWAK (microbial water analysis kit) for inflight coliform bacteria (Escherichia coli) detection (done ~11:55am). Results of the on-board processing will be available after a two-day incubation period, in case of the MWAK after 4-6 days of incubation.]*

Kononenko took US CWCs (Contingency Water Containers) #1064 & #1008 to the Russian Segment (RS) for the periodic (about twice a month) replenishing of the Elektron oxygen generator's water supply for electrolysis, filling the KOV thermal loops' EDV container. Once filled, the EDV was connected to the BPK transfer pump for processing. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron shutdown.]*

Continuing the current round of periodic preventive maintenance of RS ventilation systems, Volkov replaced the four dust collector filters (PF1-4) in the SM. Additional cleaning of fan grilles and air ducts remains on the Russian discretionary "time permitting" task list.

In preparation for the relocation of the ZSR (Zero-G Stowage Rack) at the Node-2 D5 position to the JAXA JLP (JEM Logistics Pressurized Section) position A2 tomorrow (10/9), the FE-2 cleared up the D5 location by removing stowage items, which required rotating the rack down and later moving it upright again. The removed items were restowed at other locations. *[Two more racks are also to be moved: one ZSR from Lab O5 to JPM (JEM Pressurized Module) F6, and one RSR (Resupply Stowage Rack) from Node-2 P5 to Lab O5.]*

Chamitoff also performed a test on the BOB (Breakout Box) power unit to ascertain that it can be used for Flow Meter operations on (still incomplete) ITCS MFCV (Internal Thermal Control System/Manual Flow Control Valve) adjustment later this week. *[The ground-developed test involved resistance and voltage measurements. Afterwards, the Flow Meter was also checked out, including a zero calibration, to verify that it was not damaged by the electrical anomaly on 9/30 and is still functioning properly.]*

Sergey & Oleg had 2 hrs. reserved to setting up the work area for SFP/VC15

(Space Flight Participant/Visiting Cosmonaut 15) Richard Garriott, due to arrive on 10/14 on Soyuz 17S. *[To support the ESA BIO#4 experiments during the ISS-17/ ISS-18 handover, the crewmembers unstowed and set up the KUBIK 1 & 2 controlled temperature containers (thermostats) in the SM. Activation at +21 degC and +37 degC, respectively, will occur on docking day. The equipment setups pertain to the BIOEMULSION and CONJUGATION experiments, and include the KRIOGEM-03 refrigerator, laptop HDDs (Hard Disk Drives) and digital storage cards for VC-15.]*

The FE-1 conducted another run of the Russian DZZ-2 "Diatomeya" ocean observation program, using the NIKON-F5 DCS digital still camera to shoot color contrast formations and wind-induced wave anomalies (foam bands, smooth-out sections) in sea water at specified times. *[The current DZZ-2 sessions are in support of a multi-discipline scientific expedition of the Institute of Oceanic Studies under the Russian Academy of Science, chief developer of the Diatomeya space experiment, which will be operating in the first ten days of October in the NE part of the Black Sea. Water areas with the most pronounced hydro-physical and hydro-biological characteristics are selected to be measured from the sea vessel. In good weather these water areas can be easily observed from space in colored and bright fields.]*

Sergey Volkov completed the monthly & quarterly TVIS treadmill maintenance. *[The inspection checks out the TVIS in the current SLD (subject loading device) contingency configuration, primarily looking at the condition of the SPDs (subject positioning devices) with clamp/rope assembly wire rope isolators for fraying and damage, and recording time & date values.]*

Oleg performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Sergey later took care of the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

At ~5:20pm EDT, just before sleep time, Kononenko will again set up the Russian MBI-12 SONOKARD (Sonocard) payload and start his twelfth experiment session, using a sports shirt from the SONOKARD kit with a special device in the pocket for testing a new method for acquiring physiological data without using direct contact on the skin. Measurements are recorded on a data card for return to Earth.

[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]

The CDR & FE-1 worked another hour on pre-packing cargo for return or disposal on Soyuz TMA-12, based on a detailed 15-page loading list with schematics ("maps") as stowage guides for the extremely limited stowage space in the 16S Descent Module (SA). Trashed items will be packed in the spacecraft's Orbital Module (BO).

The two cosmonauts also had a 50-min period each to themselves for the regular crew departure preparations, working on the standard end-of-increment cleanup preparatory to their return to Earth later this month. *[It is usual for Russian crewmembers to be granted reduced workdays for making their departure preparations, as their return date approaches.]*

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR/2.5h, FE-1/2.5h), and RED resistive exercise device (FE-2).

Later, the FE-1 transfers the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~3:15pm, the crewmembers will convene for their standard bi-weekly teleconference with the JSC Astronaut Office (Steve Lindsey), via S-band S/G-2 audio & phone patch.

As generally every day now, today starting at 9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) is running intermittently for two half-cycles to control $ppCO_2$ levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

Conjunction Update: One conjunction pass (of originally two) with orbital debris

from the Kosmos-2421 satellite remained under observation for today at a TCA (Time of Closest Approach) of 10:18am EDT. With a total miss distance of 18.5 km predicted yesterday and updates remaining consistently stable, the pass had a PC (Probability of Collision) of zero.

Marangoni Experiment: Today's Marangoni experiment in the JAXA JPM, requiring a "quiet" environment, will be performed between 5:30pm and 2:00am EDT, remotely controlled from Tsukuba/Japan.

MCAS Checkout Update: Yesterday's checkout by ground controllers of the MCAS (Mobile Servicing System Common Attach System) and UMA (Umbilical Mechanism Assembly) on both MBS (Mobile Base System) strings showed that the "Demated" microswitch on the string 2 MCAS UMA was not depressed as expected when powered up, and neither was the "Mated" microswitch on the prime string after the MBS switched to it. Additional commanding was required to reset. No impact to the upcoming ESP-3 (External Stowage Platform 3) operations.

GNC Issue Troubleshooting: After recent intermittent anomalous behaviors of both GNC MDM (Guidance, Navigation & Control Multiplexer/Demultiplexer) computers, flight controllers uploaded a software patch to the MDMs to gather more data for diagnostic analysis. The patch will not be exercised on orbit until after the Soyuz 16S undocking.

Week 24/25 Scheduled Main Activities:

- Thu. (10/9): MBI-12 dwnld.; ODNT OBT; IP-1 mnt.; ZSR-LAB1O5 relocate; ZSR NOD2D5 relocate; WRM CWC audit;
- Fri. (10/10): Soyuz 16S thruster/SUDN test; MO-8; MBI-12 dwld.; FFQ; ITCS MFCV adjust; RS Video MPEG config.; Water T+2 anal.; SOLO #2; CDMK check.
- Sat. (10/11): Station cleaning; PFCs; Ham radio call; SOLO #2.
- Sun. (10/12): SOLO #2; PFC; VRU disk exchange.

CEO (Crew Earth Observations) photo targets uplinked for today were **Afar Rift Zone, Ethiopia** *(the Afar Rift Zone is a depression caused by the rifting or spreading apart of the Red Sea and the Gulf of Aden. The Afar is one of two places on Earth where a spreading center can be studied on land, the other being Iceland. Greg was asked to document the modern lava flows as well as the alignment of the fault lines. Erte Ale, a large, dark volcanic structure should also have been visible),* **Teide Volcano** *(the large triangular island of Tenerife is composed of a complex of overlapping volcanoes that have remained active into historical time. The United Nations Committee for Disaster Mitigation has designated Teide as a Decade Volcano. It is considered to be the 13th most dangerous volcano in the world due*

to its proximity to several major towns and the nearby city of Puerto de la Cruz), **Hurricane Norbert** *(Hurricane Norbert is a Category 1 storm, moving toward the Baja Peninsula. It is forecasted to possibly become a Category 2 before landfall on the Baja),* and **Konza Prairie, Kansas** *(the Konza Prairie is one of the Long Term Ecological Research [LTER] sites. This target is located in the Flint Hills of northeastern Kansas. The vegetation is primarily native tall grass prairie. ISS CEO imagery will help in the study of the effects of fire, grazing and climate variability as well as help to document the grassland ecosystems. Overlapping mapping pass was requested).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

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11/18/08 -- STS-126/Endeavour/ULF2 docking - *U/R*
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
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02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/07/08
Date:	Tuesday, October 07, 2008 2:26:49 PM
Attachments:	

ISS On-Orbit Status 10/07/08

All ISS systems continue to function nominally, except those noted previously or below.

FE-2 Chamitoff had the fifth day of his first SOLO (Sodium Loading in Microgravity) session, which runs in two blocks of six days each. Today, Greg continued with measurements and sampling of body mass (with SLAMMD/Space Linear Acceleration Mass Measurement Device), blood (with PCBA/Portable Clinical Blood Analyzer), and urine, begun yesterday and continuing for one more day. *[Background: For the SOLO experiment, Chamitoff follows a special high-salt diet, for which prepared meals are provided onboard. All three daily meals are being logged on sheets stowed in the PCBA Consumable Kit in the MELFI (Minus-Eighty Laboratory Freezer for ISS) along with control solution and cartridges for the PCBA. Blood and urine samples are stowed in the MELFI. SOLO, an ESA/German experiment from the DLR Institute of Aerospace Medicine in Cologne/Germany, investigates the mechanisms of fluid and salt retention in the body during long-duration space flight. Background: The hypothesis of an increased urine flow as the main cause for body mass decrease has been questioned in several recently flown missions. Data from the US SLS1/2 missions as well as the European/ Russian Euromir `94 & MIR 97 missions show that urine flow and total body fluid remain unchanged when isocaloric energy intake is achieved. However, in two astronauts during these missions the renin-angiotensin system was considerably activated while plasma ANP concentrations were decreased. Calculation of daily sodium balances during a 15-day experiment of the MIR 97 mission (by subtracting sodium excretion from sodium intake) showed an astonishing result: the astronaut retained on average 50 mmol sodium daily in space compared to balanced sodium in the control experiment. SLAMMD, performed first on Expedition 12 in December 2005, provides an accurate means of determining the on-orbit mass of humans spanning the range from the 5th percentile Japanese female and the 95th percentile American male. The procedure, in accordance with Newton's 2nd Law of Motion, finds the mass by dividing force, generated by two springs inside the SLAMMD*

drawer, by acceleration measured with a precise optical instrument that detects the position versus time trajectory of the SLAMMD guide arm and a micro controller which collects the raw data and provides the precise timing. The final computation is done via portable laptop computer with SLAMMD unique software. To calculate their mass, crewmembers wrap their legs around a leg support assembly, align the stomach against a belly pad and either rest the head or chin on a head rest. For calibration, an 18-lbs. mass is used at different lengths from the pivot point, to simulate different mass values. Crew mass range is from 90 to 240 lbs.]

FE-1 Kononenko updated the AntiVirus program in the Russian auxiliary (VKS) laptops RSS1, RSK1, RSK2, RSE1 from a new uplinked program copy on the RSS2 laptop, first scanning the latter, then transferring the database by flash-card to the other computers and scanning them one by one.

CDR Volkov terminated his first session of the Russian MedOps MO-2 protocol which calls for 24-hour recording of his ECG (electrocardiogram) and assisted the FE-1 in donning the equipment for his turn with MO-2 for the next 24 hrs. *[For the ECG recording, each cosmonaut wears the five-electrode Holter harness that reads their dynamic (in motion) heart function from two leads over 24 hours and record data on the Kardioregistrator 90205 unit.]*

After downloading the accumulated IWIS (Internal Wireless Instrumentation System) structural dynamics data from Saturday's (10/4) Progress thruster reboost of the ISS from the RSUs (Remote Sensor Units) in the US Lab, Node-1, Node-2, FGB and SM (Service Module), Volkov today powered down the sensors and NCU (Network Control Unit).

FE-2 Chamitoff had about two hours reserved for unpacking US cargo delivered on Progress M65/30P.

Volkov & Kononenko worked another two hours each on pre-packing return cargo to be loaded on Soyuz TMA-12, based on a detailed 15-page loading list with schematics ("maps") as stowage guides for the extremely limited stowage space in the 16S Descent Module (SA).

For a VolSci (Voluntary Science) program session tonight before sleeptime, Gregory set up the BCAT-4 (Binary Colloid Alloy Test 4) experiment, first familiarizing himself with payload hardware & operations, then setting up the experiment in the Lab Avionics Racks 2 & 3 seat track area, along with camcorder and still camera,- to take video and photos of Greg performing sample homogenization, the first crystal check of the session, crystal photography, and sample photography, and then initiated the activity. *[The FE-2 configured the SGSM (slow growth sample module) by mixing the samples 8, 9, 10, and 3 and*

starting automated photography of sample 3 with the Kodak DCS-760 digital still camera controlled by the EarthKAM software running on an SSC (Station Support Computer).]

The two cosmonauts again had a one-hour period each to themselves for the regular crew departure preparations, working on the standard end-of-increment cleanup preparatory to their return to Earth later this month. *[It is usual for Russian crewmembers to be granted reduced workdays for making their departure preparations, as their return date approaches.]*

In preparation for the arrival of Mike Fincke, the new CDR of Expedition 18, Greg Chamitoff collected and gathered the physical exercise equipment to be used by Mike, already in stowage on board or newly delivered on Progress 30P. *[Typical items are HRM (Heart Rate Monitor) chest strap, watch & transmitter, PCMCIA memory cards, treadmill harness, and exercise shoes, etc.]*

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR/2.5h, FE-1/2.5h), and RED resistive exercise device (FE-2).

Later, the CDR transfers the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Oleg performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Sergey later took care of the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

In preparation for the arrival and on-orbit stay of the next SFP & VC15 (Space Flight Participant/Visiting Cosmonaut 15) Richard Garriott, the crew conducted a 90-min. review of Garriott’s projected timeline and then tagged up with ground specialists to discuss the planned VC15 activity program. *[VC15 will be performed from 10/12-10/23 (10/14-10/23 in the ISS RS/Russian Segment). The program involves 3 real-time TV events between RS and TsUP-Moscow, 12 ham radio sessions, photo &*

*video imagery in the RS interior, commemorative activities and once-daily tagups with an advisory group. There are three experiment blocks: (1) Richard Garriott's VC-15 experiments: "**PICTURE**" (creation of a painting in micro-G), "**DHL-G**" (demonstration of the law of preservation of energy), "**PCG**" (protein crystallization in micro-G), and "**ARISS**" (ham radio comm using slow-scan TV system); (2) ESA VC-15 experiments: "**MUSCLE-G**" (assessment of micro-G impact on contracting muscles & neurophysiological properties of quadrocetal muscle in humans), "**MOP-G**" (vestibular adaptation to changes in micro-G, SAS/ Space Adaptation Syndrome); and (3) NASA VC-15 experiments: "**SLEEP-G**" (Actiwatch recording of activity during sleep and after waking & exposure to light during spaceflight), "**IMMUNO-G**" (immune system monitoring), "**CORNEA-G**" study of effects of micro-G on eye corona). There will also be a Russian and ESA experiment program performed by ISS-17 & ISS-18 crewmembers during the VC-15 period.]*

The crew had their regular PMCs (Private Medical Conferences), via S-band/audio & Ku-band/video, Greg at ~10:25am, Sergey at ~12:55pm, Oleg at ~2:30pm.

A new job on the Russian discretionary task list for Volkov & Kononenko is to take out time for more RS ventilation system cleaning.

At ~7:24am EDT, Gregory powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, & power supply) and conducted, at 7:29am, a ham radio exchange with the Scuola Media Statale Donato Forlani in Conversano, Italy. *[The Scuola media D. Forlani is a middle school in the suburb of Conversano, a small town located 30km from Bari in South-east Italy. The school has 30 classrooms and various laboratories, including an astronomy lab. About 250 pupils attend the school, aged from 11 to 14. Extracurricular activities include English conversation, sport, theatre, the environment and other research activities. Questions to Greg were uplinked beforehand. "What is the most ambitious spatial project for the future?"; "What do you see at the moment when you are looking outside the ISS?"; "How does it feel to be in space?"; "Is it difficult to get used to zero gravity?"; "What do you think about extraterrestrial life in the universe?"; "How many years ago did you start your career as astronaut?"; "What studies are necessary to become an astronaut?"; "Where does the electric power come from on board the ISS?"; "Was it your childhood dream to become an astronaut?"; "At what age did you discover your passion for space?"]*

As generally every day now, today starting at 9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) is running intermittently for two half-cycles to control $ppCO_2$ levels. This configuration for the daily ops does not require

connecting & disconnecting the ITCS cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

Conjunction Update: Two conjunction passes with orbital debris from the Kosmos-2421 satellite are being closely monitored for tomorrow (Wednesday, 10/8), for a TCA (Time of Closest Approach) at 10:18am EDT and at 11:49am. The passes are not considered to be threat at this point. The preliminary PC (Probability of Collision) for each is zero and is expected to remain zero.

Marangoni Experiment: Today's Marangoni experiment in the JAXA JPM, requiring a "quiet" environment, will be performed between 5:30pm and 2:00am EDT, remotely controlled from Tsukuba/Japan.

MCAS Checkout: MCC-Houston, by ground control, performed a checkout of the MCAS (Mobile Servicing System Common Attach System) in early preparation for ULF-2. Russian thrusters were inhibited during the period from 9:00am to 11:50am for the checkout, and physical exercise by the crew could not be performed during this time on unisolated equipment (i.e., RED).

Week 24/25 Scheduled Main Activities:

- Wed. (10/8): SOLO; MO-2; 16S Return stowage; CMS analyz.; Diatomeya; Water sampling; ZSR Rack prep.; MBI-12 prep./init.
- Thu. (10/9): MBI-12 dwnld.; ODNT OBT; IP-1 mnt.; ZSR-LAB1)5 relocate; ZSR NOD2D5 relocate; WRM CWC audit;
- Fri. (10/10): Progress thruster/SUDN; MO-8; MBI-12 dwld.; FFQ; ITCS MFCV adjust; RS Video MPEG config.; Water T+2 anal.; SOLO #2; CDMK check.
- Sat. (10/11): Station cleaning; PFCs; Ham radio call; SOLO #2.
- Sun. (10/12): SOLO #2; PFC; VRU disk exchange.

CEO (Crew Earth Observations) photo targets uplinked for today were **East Haruj Megafans** *(one of CEO's terrestrial analogues for Mars, the East Haruj megafans shows ancient river courses that originated from the Tibesti Mountains. These numerous ancient river channels can be compared to similar regions on Mars. The area of interest is to the south and east of the very dark volcanic structure called Waw an Namus [Oasis of Mosquitoes]. Mapping pass with overlapping images was requested. The area of interest was to the right of the ISS orbital track),* **Mount Vesuvius** *(known for its historic eruption in 79 A.D., Vesuvius lead to the destruction of Pompeii and Herculaneum, but ironically also allowed for their preservation. Vesuvius is still considered an active volcano. It is located east of Naples and is the only volcano on the European mainland to have erupted within*

the last 100 years. Detailed views of Vesuvius were requested. Some clouds may have been present), and **Barringer Impact Crater** *(also known as Meteor crater, this approximately 50,000 year old impact crater is about 1.2 km in diameter and 170 m deep. It is located 43 miles east of Flagstaff, near Winslow, Arizona. Detailed images of this impact crater were requested).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this noon, 12:06pm EDT [= epoch]):
Mean altitude -- 352.9 km
Apogee height -- 355.7 km
Perigee height -- 350.2 km
Period -- 91.60 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0004082
Solar Beta Angle -- -27.8 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 48 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56623

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
10/10/08 -- Progress 30P thruster test
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Fincke, Lonchakov, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/24/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) & landing (local time!)
11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*
11/16/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC (~7:02pm EST) - *U/R*
11/18/08 -- STS-126/Endeavour/ULF2 docking - *U/R*
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.)
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)

03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From: vonPuttkamer, Jesco H. (HQ-CJ000)

To: Von Puttkamer, Jesco H. (HQ-CE010);

CC:

Subject: ISS On-Orbit Status 10/06/08

Date: Monday, October 06, 2008 11:19:24 AM

Attachments:

ISS On-Orbit Status 10/06/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 25 of Increment 17.*

FE-2 Chamitoff had the fourth day of his first SOLO (Sodium Loading in Microgravity) session, which runs in two blocks of six days each. Today, Greg began with measurements and sampling of body mass (with SLAMMD/Space Linear Acceleration Mass Measurement Device), blood (with PCBA/Portable Clinical Blood Analyzer), and urine, to continue for two more days. *[Background: For the SOLO experiment, Chamitoff follows a special high-salt diet, for which prepared meals are provided onboard. All three daily meals are being logged on sheets stowed in the PCBA Consumable Kit in the MELFI (Minus-Eighty Laboratory Freezer for ISS) along with control solution and cartridges for the PCBA. Blood and urine samples are stowed in the MELFI. SOLO, an ESA/German experiment from the DLR Institute of Aerospace Medicine in Cologne/Germany, investigates the mechanisms of fluid and salt retention in the body during long-duration space flight. Background: The hypothesis of an increased urine flow as the main cause for body mass decrease has been questioned in several recently flown missions. Data from the US SLS1/2 missions as well as the European/Russian Euromir `94 & MIR 97 missions show that urine flow and total body fluid remain unchanged when isocaloric energy intake is achieved. However, in two astronauts during these missions the renin-angiotensin system was considerably activated while plasma ANP concentrations were decreased. Calculation of daily sodium balances during a 15-day experiment of the MIR 97 mission (by subtracting sodium excretion from sodium intake) showed an astonishing result: the astronaut retained on average 50 mmol sodium daily in space compared to balanced sodium in the control experiment. SLAMMD, performed first on Expedition 12 in December 2005, provides an accurate means of determining the on-orbit mass of humans spanning the range from the 5th percentile Japanese female and the 95th percentile American male. The procedure, in accordance with Newton's 2nd Law of Motion, finds the mass by dividing force, generated by two springs inside the SLAMMD drawer, by acceleration measured with a precise optical instrument that detects the*

position versus time trajectory of the SLAMMD guide arm and a micro controller which collects the raw data and provides the precise timing. The final computation is done via portable laptop computer with SLAMMD unique software. To calculate their mass, crewmembers wrap their legs around a leg support assembly, align the stomach against a belly pad and either rest the head or chin on a head rest. For calibration, an 18-lbs. mass is used at different lengths from the pivot point, to simulate different mass values. Crew mass range is from 90 to 240 lbs.]

CDR Volkov & FE-1 Kononenko tried on their KENTAVR suits for a fit check, supported by tagup with specialists (S-band). *[The Kentavr ("Centaur") garment (not to be confused with the Russian "Pinguin" suit for spring-loaded body compression, or the "Chibis" lower body negative pressure suit) is a protective anti-g suit ensemble to facilitate the return of a long-duration crewmember into the Earth gravity. Consisting of shorts, gaiters, underpants, jersey and socks, it acts as countermeasure for circulatory disturbance, prevents crewmember from overloading during descent and increases orthostatic tolerance during post-flight adaptation. Russian crewmembers are also advised to ingest fluid-electrolyte additives, viz., three sodium chloride tablets during breakfast and after the midday meal, each time with 300 ml of fluid, and two pills during the meal aboard Soyuz before deorbit.]*

Sergey & Oleg also started their first session of the Russian MedOps MO-2 protocol which calls for 24-hour recording of their ECGs (electrocardiograms). *[For the ECG recording, Sergey & Oleg donned the five-electrode Holter harness that read their dynamic (in motion) heart function from two leads over 24 hours and record data on the Kardioregistrator 90205 unit. The crewmembers assisted each other in the harness donning (and will also do so in tomorrow's doffing).]*

The CDR set up the equipment for transferring TEKh-20 PK-3+ (Plasma Crystal-3+) experiment digital video data to the Russian BSPN Payload Server. After the transfer, the Telescience hardware was torn down for stowage. *[When operating, the PK-3+ experiment studies dust plasma crystallization processes in a vacuum chamber at specified settings of HF (high frequency) discharge power, chamber pressure, and a varied number of particles,followed by observing the melting of the structures formed earlier.]*

FE-2 Chamitoff checked out the U.S. SLM (Sound Level Meter) instrument and then used it to conduct the periodic noise level measurements program in the station interior for a 2-hr acoustic survey, including transfer of the recorded data to the MEC (Medical Equipment Computer). *[A total of 48 acoustic measurements were obtained, specifically at 13 locations in the Lab, four locations in Node-1, 11 locations in the SM, three locations in the DC1 (Docking Compartment), seven locations in the FGB and eight locations in the JPM (JEM Pressurized Module). The survey also includes two crew preference locations taken at their perceived*

loudest locations in the station. The SLM gives instantaneous noise levels and their frequency spectra, which are transferred to the MEC laptop via an RS232 cable and later downlinked with regular CHeCS (Crew Health Care Systems) data dump or via OCA.]

After setting up the Rodnik “plumbing” gear with pump, adapters and hoses, Malenchenko transferred accumulated urine from three EDV-U containers (#824, #827, #789) to the BV1 water tank. BV1 was then flushed with 5 liters of dis9infectant solution, followed by disassembly and stowage of the equipment. The first urine transfer to 30P took place on 9/24. *[Each of the two spherical Rodnik tanks consists of a hard shell with a soft membrane (bladder) composed of elastic fluoroplastic. The bladder is used to expel water from the tank by compressed air pumped into the tank volume surrounding the membrane.]*

Gregory powered down PCS (Portable Computer System) laptops in COL (Columbus Orbital Laboratory), JPM and US Lab (Cupola A31p). *[Infrequently used laptops are turned off to preserve lifetime.]*

FE-1 Kononenko set up and ran a hardware test on the control unit laptop of the BIO-5/Rasteniya-2 ("Plants-2") Lada-13 greenhouse to check its hard drive for possible virus infection.

FE-2 Chamitoff performed another standard sensor calibration on the CSA-O_2 (Compound Specific Analyzer-Oxygen) units #1043 & #1059, delivered on 1J, using a new calibration adapter (#1001), brought up by 30P.

Later, Greg conducted microbiological sampling, taking surface samples with the SSK (Surface Sample Kit) for the visual microbial (bacterial & fungal) “T+5 Day” analysis. SSK samples were not taken last month due to crew time constraints. *[The sampling analysis is performed once per month for the first three months, and once every three months thereafter. Bacterial and fungal air samples are taken at two locations in each module. The colony growth on the sampling slides is analyzed after five days of incubation in four Petri dishes. For onboard visual analysis of media slides from SSK (Surface Sampling Kit), MCDs (microbial capture devices) from WMK (Water Monitoring Kit), coliform detection bags from MWAK (Microbial Water Analysis Kit), and MAS (Microbial Air Sampler) Petri dishes, the crew has a procedure for visual inspection of samples for bacterial and fungal colony growths after appropriate incubation periods.]*

Oleg conducted another run of the Russian DZZ-2 "Diatomeya" ocean observation program, using the NIKON-F5 DCS digital still camera to shoot color contrast formations and wind-induced wave anomalies (foam bands, smooth-out sections) in

sea water at specified times. *[The current DZZ-2 sessions are in support of a multi-discipline scientific expedition of the Institute of Oceanic Studies under the Russian Academy of Science, chief developer of the Diatomeya space experiment, which will be operating in the first ten days of October in the NE part of the Black Sea. Water areas with the most pronounced hydro-physical and hydro-biological characteristics are selected to be measured from the sea vessel. In good weather these water areas can be easily observed from space in colored and bright fields.]*

The CDR and FE-2 had time reserved for unpacking US cargo delivered by Progress 30P.

Volkov and Kononenko also had about two hours set aside for pre-packing return cargo to be loaded on Soyuz TMA-12/16S, based on a detailed 15-page loading list with schematics ("maps") as stowage guides for the extremely limited stowage space in the Soyuz Descent Module (SA).

Sergey performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Oleg later performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The CDR downloaded the accumulated structural dynamics data from Saturday's (10/4) Progress thruster reboost of the ISS from the IWIS RSUs (Internal Wireless Instrumentation System/Remote Sensor Units).

The two cosmonauts again had a one-hour period each to themselves for the regular crew departure preparations, working on the standard end-of-increment cleanup preparatory to their return to Earth later this month. *[It is usual for Russian crewmembers to be granted reduced workdays for making their departure preparations, as their return date approaches.]*

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR/2.5h, FE-1/2.5h), and RED resistive exercise device (FE-2).

Later, the CDR transfers the exercise data file to the MEC laptop for downlink,

including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~4:30am EDT, Volkov & Kononenko tagged up with ground specialists at TsUP/ Moscow via S-band to discuss their preparations for their return on 16S and expected events & experiences during their ride in the Soyuz Descent Capsule to touchdown in Kazakhstan on 10/24.

At ~12:45pm, Greg Chamitoff supported two PAO TV interviews of ~10 min each, one with the "Gil Gross" syndicated radio show on KGO Radio (Gil Gross), San Francisco, CA, the other with SPACE.COM (Tariq Malik).

At ~2:10pm, the FE-2 is also scheduled for a CDE (Crew Discretionary Event) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

As generally every day now, today starting at 9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) is running intermittently for two half-cycles to control ppCO_2 levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

Vozdukh Malfunctions: The Vozdukh CO_2 removal system has exhibited several temporary failures in the last few days, "more frequently than usual", according to RSC-Energia. Analysis is underway.

Conjunction Advisory: Another conjunction with a piece of orbital debris is being closely monitored, for a TCA (Time of Closest Approach) on Wednesday morning (10/8), possibly requiring a DAM (Debris Avoidance Maneuver). Decision point for conducting the DAM is tomorrow morning.

Marangoni Experiment: Today's Marangoni experiment in the JAXA JPM, requiring a "quiet" environment, will be performed between 5:30pm and 2:00am EDT, remotely controlled from Tsukuba/Japan.

Week 24/25 Scheduled Main Activities:

- Tue. (10/7): SOLO; MO-2; ITCS RFCA reconfig.; PEP R7 transition.
- Wed. (10/8): SOLO; MO-2; 16S Return stowage; CMS analyz.; Diatomeya; Water sampling; ZSR Rack prep.; MBI-12 prep./init.

- Thu. (10/9): MBI-12 dwnld.; ODNT OBT; IP-1 mnt.; ZSR-LAB1)5 relocate; ZSR NOD2D5 relocate; WRM CWC audit;
- Fri. (10/10): Progress thruster/SUDN; MO-8; MBI-12 dwld.; FFQ; ITCS MFCV adjust; RS Video MPEG config.; Water T+2 anal.; SOLO #2; CDMK check.
- Sat. (10/11): Station cleaning; PFCs; Ham radio call; SOLO #2.
- Sun. (10/12): SOLO #2; PFC; VRU disk exchange.

No CEO (Crew Earth Observation) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 6:51am EDT [= epoch]):
Mean altitude -- 353.0 km
Apogee height -- 355.8 km
Perigee height -- 350.2 km
Period -- 91.60 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0004156
Solar Beta Angle -- -23.0 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 20 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56603

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
10/10/08 -- Progress 30P thruster test
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Fincke, Lonchakov, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/24/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) & landing (local time!)
11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*
11/16/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC (~7:02pm EST) - *U/R*
11/18/08 -- STS-126/Endeavour/ULF2 docking - *U/R*
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.)
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch

02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/05/08
Date:	Sunday, October 05, 2008 12:05:28 PM
Attachments:	

ISS On-Orbit Status 10/05/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – off-duty day for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff. Ahead: Week 25 of Increment 17.*

The two Russian crewmembers had their first preliminary training session with the Russian "Chibis" LBNP suit (lower body negative pressure; Russian: ODNT), ramping up to get them ready for returning to gravity on 10/24. Assisting each other in turn as CMO (Crew Medical Officer), the subjects were supported in their two one-hour sessions by ground specialist tagup via VHF at 5:13am (DO16) & 6:48am EDT (DO1). *[The assessment uses the Gamma-1 ECG equipment with biomed harness, skin electrodes and a blood pressure and rheoplethysmograph cuff wired to the cycle ergometer's instrumentation panels. The Chibis ODNT provides gravity-simulating stress to the body's cardiovascular/circulatory system for evaluation of Volkov's and Kononenko's orthostatic tolerance (e.g., the Gauer-Henry reflex) after several months in zero-G. The preparatory training generally consists of first imbibing 150-200 milliliters of water or juice, followed by two cycles of a sequence of progressive regimes of reduced ("negative") pressure, set today at -15, -20, -25, and -30 mmHg (Torr) for five min. each while shifting from foot to foot at 10-12 steps per minute, wearing a sphygmomanometer to measure blood pressure. The body's circulatory system interprets the pressure differential between upper and lower body as a gravity-like force pulling the blood (and other liquids) down. Chibis data and biomed cardiovascular readings are recorded. The Chibis suit (not to be confused with the Russian "Pinguin" suit for spring-loaded body compression, or the "Kentavr" anti-g suit worn during reentry) is similar to the U.S. LBNP facility (not a suit) used for the first time on Skylab in 1973/74, although it appears to accomplish its purpose more quickly.]*

FE-2 Chamitoff observed the third day of his first SOLO (Sodium Loading in Microgravity) session, which runs in two blocks of six days each. Measurements and sampling of body mass, blood, and urine will begin this week. *[During this period, Chamitoff follows a special high-salt diet, for which prepared meals are*

provided onboard. All three daily meals will be logged on sheets stowed in the PCBA (Portable Clinical Blood Analyzer) Consumable Kit in the MELFI (Minus-Eighty Laboratory Freezer for ISS) along with control solution and cartridges for the PCBA. SOLO, an ESA/German experiment from the DLR Institute of Aerospace Medicine in Cologne/Germany, investigates the mechanisms of fluid and salt retention in the body during long-duration space flight. Background: The hypothesis of an increased urine flow as the main cause for body mass decrease has been questioned in several recently flown missions. Data from the US SLS1/2 missions as well as the European/Russian Euromir `94 & MIR 97 missions show that urine flow and total body fluid remain unchanged when isocaloric energy intake is achieved. However, in two astronauts during these missions the renin-angiotensin system was considerably activated while plasma ANP concentrations were decreased. Calculation of daily sodium balances during a 15-day experiment of the MIR 97 mission (by subtracting sodium excretion from sodium intake) showed an astonishing result: the astronaut retained on average 50 mmol sodium daily in space compared to balanced sodium in the control experiment.]

Gregory also had three hours reserved for his part of the regular weekly station cleaning in the USOS (US Segment) which was not scheduled yesterday alongside the RS (Russian Segment) “uborka” housecleaning by his two crewmates due to his VolSci (Voluntary Science) program with SPHERES.

Sergey Volkov performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM (Service Module), including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

SOZh maintenance by the CDR today also involved the Russian POTOK-150MK (150 micron) air filter unit of the SM’s SOGS air revitalization subsystem, gathering weekly data on total operating time & “On” durations for reporting to TsUP-Moscow.

Gregory unstowed the Contingency Jumper Kit SODF (Systems Operation Data File) and updated it with pen & ink changes according to recent removals or installations of tools, jumpers, etc.

At ~10:20am, Dr. Chamitoff also had his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

The crew completed their daily physical workout program (about half of which is

used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-2, FE-1), and RED resistive exercise device (FE-2). Part of Sergey's & Oleg's exercise was accounted for by their 1-hr Chibis sessions.

As generally every day now, today starting at 9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) is running intermittently for two half-cycles to control $ppCO_2$ levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

Reboost Actuals: Yesterday's ISS reboost by Progress 30P thrusters at 6:06am EDT yielded a delta-V of 0.75 m/s (2.5 ft/s) and a mean altitude increase of 1.3 km (0.7 n.mi.), all very close to predicted values.

Week 24/25 Scheduled Main Activities:

- Mon. (10/6): SOLO; KENTAVR adjust; MO-2; PMCs; TEKh-20 (PK-3+) BSPN transfer; 30P stow; SLM Acoustic Survey; Rodnik transfer; CSA-O2 cal.; SSK sampling.
- Tue. (10/7): SOLO; MO-2; ITCS RFCA reconfig.; PEP R7 transition.
- Wed. (10/8): SOLO; MO-2; 16S Return stowage; CMS analyz.; Diatomeya; Water sampling; ZSR Rack prep.; MBI-12 prep./init.

No CEO (Crew Earth Observation) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

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11/18/08 -- STS-126/Endeavour/ULF2 docking - *U/R*
11/20/08 -- **ISS 10 Years**
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12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.)

02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
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02/14/09 -- STS-119/Discovery/15A docking
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/04/08
Date:	Saturday, October 04, 2008 2:05:40 PM
Attachments:	

ISS On-Orbit Status 10/04/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – off duty day for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff.*

The delayed **ISS reboost by Progress 30P thrusters took place this morning** at 6:06am EDT. It was deferred from 10/2 because of a post-reboost conjunction conflict. *[Station attitude control authority was handed over to Russian thruster control at 3:55am and returned to US CMGs (Control Moment Gyroscopes) at 7:45am. The purpose of the reboost was to set up phasing for the Soyuz-16/17 landing & launch. Actual performance data are not available yet. The latest projection showed one post-burn orbital debris conjunction at -1.9 km radial miss distance, which satisfied the clearing requirement of >0.75 km.]*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the SM (Service Module) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

At ~10:00am EDT the crewmembers conducted their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-Houston and TsUP-Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

FE-2 Chamitoff checked out the SAMS ICU (Space Acceleration Measurement System/Interface Control Unit) and its PCMCIA (Portable Computer Memory Card International Adapter) memory card and associated cable as initial troubleshooting

steps. *[Efforts to complete a SAMS ghost load procedure have been delayed by the inability of the SAMS ICU laptop to communicate via FTP to the ER#4 ELC (EXPRESS Rack 4 Laptop Computer). Troubleshooting efforts to date indicate a "broken" connection between the two laptop computers. Today's check was to see whether the memory card is loose or faulty.]*

Oleg Kononenko conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Gregory Chamitoff's chosen VolSci (Voluntary Weekend Science) program today was another 3.5-hour run with the payload SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellites), for which Greg set up the work area in the Lab and two PD-100 camcorders for video capture, dimmed the GLAs (General Luminaire Assemblies) and used the SSC (Station Support Computer) laptop to control the test satellites. *[The SPHERES experiment is a test bed for the development and testing of formation flying and other multi-spacecraft control algorithms. Today's session again used three satellites and five beacons on mounts, with three CO_2 (Carbon Dioxide) tanks and six battery packs, to experiment with docking, formation flight, and reconfigurations. In addition, the session added a wide range of control algorithms for maneuvers previously demonstrated using basic control laws. Modern robust control techniques are combined with path planning and formation flight algorithms to improve the performance of the system. The session also continued to obtain data for control reconfiguration after satellites dock (and their mass properties change). Per applicable Flight Rule, SPHERES operations have no CO_2 output constraints if the CDRA (CO_2 Removal Assembly) is operating in dual-bed or single-bed mode.]*

The FE-1 conducted another run of the Russian DZZ-2 "Diatomeya" ocean observation program, using the NIKON-F5 DCS digital still camera to shoot color contrast formations and wind-induced wave anomalies (foam bands, smooth-out sections) in sea water at specified times. *[The current DZZ-2 sessions are in support of a multi-discipline scientific expedition of the Institute of Oceanic Studies under the Russian Academy of Science, chief developer of the Diatomeya space experiment, which will be operating in the first ten days of October in the NE part of the Black Sea. Water areas with the most pronounced hydro-physical and hydro-biological characteristics are selected to be measured from the sea vessel. In good weather these water areas can be easily observed from space in colored and bright fields.]*

Gregory observed the second day of his first SOLO (Sodium Loading in Microgravity) session, which runs in two blocks of six days each. Measurements and sampling of body mass, blood, and urine will begin next week. *[During this period, Chamitoff follows a special high-salt diet, for which prepared meals are provided onboard. All three daily meals will be logged on sheets stowed in the PCBA (Portable Clinical Blood Analyzer) Consumable Kit in the MELFI (Minus-Eighty Laboratory Freezer for ISS) along with control solution and cartridges for the PCBA. SOLO, an ESA/German experiment from the DLR Institute of Aerospace Medicine in Cologne/Germany, investigates the mechanisms of fluid and salt retention in the body during long-duration space flight. Background: The hypothesis of an increased urine flow as the main cause for body mass decrease has been questioned in several recently flown missions. Data from the US SLS1/2 missions as well as the European/Russian Euromir `94 & MIR 97 missions show that urine flow and total body fluid remain unchanged when isocaloric energy intake is achieved. However, in two astronauts during these missions the renin-angiotensin system was considerably activated while plasma ANP concentrations were decreased. Calculation of daily sodium balances during a 15-day experiment of the MIR 97 mission (by subtracting sodium excretion from sodium intake) showed an astonishing result: the astronaut retained on average 50 mmol sodium daily in space compared to balanced sodium in the control experiment.]*

The crew completed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR/2.5h, FE-1/2.5h), and RED resistive exercise device (FE-2).

Later, the FE-1 is to transfer the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

As generally every day now, today starting at 10:05am and running until 4:05pm (timed to support Greg's SPHERES activities), the US CDRA (Carbon Dioxide Removal Assembly) is running intermittently for two half-cycles to control $ppCO_2$ levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

Week 24/25 Scheduled Main Activities:

- Sun. (10/5): PFP-ODNT OBT/trng.; SODF updating.
- Mon. (10/6): SOLO; KENTAVR adjust; MO-2; PMCs; TEKh-20 (PK-3+)

BSPN transfer; 30P stow; SLM Acoustic Survey; Rodnik transfer; CSA-O2 cal.; SSK sampling.

- Tue. (10/7): SOLO; MO-2; ITCS RFCA reconfig.; PEP R7 transition.

Weekly Science Update *(Expedition Seventeen -- Week 24)*

3-D SPACE: In progress.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Measurements continue in FGB module.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3/4 (Binary Colloidal Alloy Test 3/4): "Greg, some of the photos you took earlier of BCAT-3 & BCAT-4 are excellent. You managed to get the focus nice and sharp revealing that four of the seven Harvard samples near the critical point are phase separated. This will help guide future operations. We are ready for operations this coming Tuesday where you will homogenize BCAT-4 samples 8, 9, 10, and 3 and then take both manual and automated EarthKAM photos of Sample 3, which will run for 6 days. Thank you very much."

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-2/CGBA-5 (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus 5): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): Due to safety concerns identified for the PLEGPAY instrument (when operated in Plasma Discharge mode), the entire EuTEF platform was put in survival mode on 9/1 at around 11:00am EDT (just prior to 29P undocking). Since then, the EuTEF power feeder#1 has been de-activated and no science acquisition is possible. Request has been approved for intermittent activation for 3 of the 9 EUTEF payloads. EuTEF platform power feeder#1 has been re-activated for 4-hrs periods on 9/20, 9/22, 9/24 and will continue to be re-activated every other day until safety issues are solved with the PLEGPAY instrument. This mitigates the science loss for the EXPOSE, DOSTEL and MEDET instruments only. EuTEF platform power feeder#1 has been re-activated for 4-hrs periods on 9/20, 9/22, 9/24, 9/26, 9/28, 9/30 and 10/2. This activation protocol will continue every other day until safety issues are solved with the PLEGPAY instrument. This only mitigates the science loss for the EXPOSE, DOSTEL and MEDET instruments. -- DEBIE-2: Inactive;-- DOSTEL: Inactive, part of proposed intermittent activation;-- EuTEMP: Inactive;-- EVC: Inactive;-- EXPOSE: Inactive, part of proposed intermittent activation;-- FIPEX: Inactive; -- MEDET: Inactive, part of proposed intermittent activation; -- PLEGPAY: Inactive;-- TRIBOLAB: Inactive.

FSL (Fluid Science Laboratory): FSL is nominal.

GEOFLOW: In progress.

HDTV System Test DL (JAXA): In progress.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): In progress.

Marangoni Experiment for ISS (JAXA Fluid Physics Experiment Facility): In the early morning of 9/29, the liquid bridge in the FEEF Experiment Chamber has broken. PI team is investigating the future plan, but will not require crew time for

this trouble shooting during Increment 17. The experiment itself will be continued at least until next week. Today's (10/4) Marangoni Experiment will be performed between 7:30pm EDT and 2:00am tomorrow morning.

Micro-G Clay (JAXA EPO): Complete.

MISSE (Materials ISS Experiment): Ongoing.

Moon Photography from ISS (JAXA EPO): Complete.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 "Pirs".

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-1/-2 (Nitric Oxide Analyzer, ESA): Last NOA-1 session for Sergey and Oleg has been successfully performed on 9/30. NOA return items have been pre-packed for 16S return.

NUTRITION w/REPOSITORY: "Greg, thanks for your hard work in successful completion of your FD120 session! We appreciate all of the barcode information provided in crew notes.In progress."

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PCRF (Protein Crystallization Research Facility) Reconfiguration (JAXA): Complete.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): "Congratulations, Greg, for successfully completing the final test runs for SHERE! The final two runs were successful despite the behaviour of the first run. The "snapped" fluid provided valuable information on our stability limits and showed the issue is more complex than we originally thought. We also obtained a full data file despite the computer re-boot. The second run looked beautiful, and we are currently analyzing it in detail.

Thanks for all your hard work!"

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): "Greg, Thanks for completing your Actiwatch download and initialization as well as getting the Actiwatches ready for I-18 CDR and 17S SFP. We are currently targeting the week of Oct 13 for your next week of sleep logging."

SOLAR (Solar Monitoring Observatory): Current Sun visibility window has started on 9/27. Since then the instruments have been operating nominally, with the exception of SOLACES which encountered a synchronization problem for its two micro-controllers units. Three Criss-Cross maneuvers have been successfully performed on 10/1 for the SOLSPEC instrument. SOLAR platform has also been put in safe mode on 10/2 in preparation of the 30P reboost. After the reboost postponement, SOLAR has been put back into Pointing Mode.-- SOVIM: acquiring science;-- SOLSPEC: acquiring science – science team is currently assessing the influence of the SAA crossing for their data. In their data, they noticed a higher than expected background level; -- SOLACES: instrument powered on, but since 09/30 (GMT274) no science acquisition is possible due to micro-controllers synchronization problems. Teams on ground are investigating.

SOLO (Sodium Loading in Microgravity): First SOLO session started yesterday (10/3), to consist of 2 blocks of 6 days each, ending on the 17S docking day (10/14).

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): Reserve.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): Completed.

CEO (Crew Earth Observations): Through 9/28 the ground has received a total of 7,874 frames of CEO images for review and cataloging. Photos with times corresponding to CEO target request times are reviewed first and since the last report included Tenoumer Impact Crater, Mauritania (20 frames-unconfirmed and under review); Southern Mozambique (25 frames-unconfirmed and under review); and Lake Poopo, Bolivia (24 frames-confirmed with a number of useful frames). "Your recent rare image of icy Bouvet Island in the South Atlantic Ocean will be published on NASA/GSFC's Earth Observatory website this weekend. Your crisp,

long-lens view of the world's most remote island updates and exceeds the quality of the last one acquired during Increment 2. Nice shot! Although you continue to acquire good imagery at times, most of your recent imagery is soft or seems improperly exposed. We encourage you to keep practicing with the cameras. Thank you for your continued support of our payload."

CEO photo targets uplinked for today were **Lake Nasser, Toshka Lakes, Egypt** *(Greg recently acquired a number of excellent context views of this target area located in the desert just west of the Aswan Dam and Lake Nasser. On this midday pass in clear weather he should have had a near-nadir view of the western lakes. This time he was to try for a detailed long lens view of the recent human development near the lake, i.e. agriculture, roads, canals),* **Georgia Coastal Ecosystems** *(this Long Term Ecological Research [LTER] site consists primarily of coastal wetland areas and barrier islands. On this clear to partly cloudy, early afternoon pass ISS track was offshore, with the areas of interest to the left. Trying for short-lens context views of the coastal features from just south of Brunswick to just north of Savannah, Georgia),* and **Palmerston Island reef, central South Pacific** *(this oddly shaped atoll is located in the tropical south Pacific over 2,500 miles south of the Hawaiian Islands. The lagoon is about seven miles across. As part of an international inventory and monitoring effort of the Earth coral reef resources, CEO researchers are seeking detailed, near-nadir views of the coral reef structures of this atoll system. ISS had a fine pass in mid-morning with partly cloudy skies expected. Looking just right of track)*.

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Perigee height -- 347.0 km
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Inclination (to Equator) -- 51.65 deg
Eccentricity -- 0.0008661
Solar Beta Angle -- -13.1 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude gain in the last 48 hours -- 77 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56576

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Fincke, Lonchakov, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)

10/24/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) & landing
11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*.
11/16/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC (~7:02pm EST) - *U/R*
11/18/08 -- STS-126/Endeavour/ULF2 docking - *U/R*
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.)
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/03/08
Date:	Friday, October 03, 2008 1:34:20 PM
Attachments:	

ISS On-Orbit Status 10/03/08

All ISS systems continue to function nominally, except those noted previously or below.

FE-2 Chamitoff started out in the JAXA Kibo JPM (JEM Pressurized Module) by preparing the AVCO (Air Ventilation Closeout) for the subsequent MELFI rack transfer. *[The reconfiguration consisted in removing a soft dummy panel from location A4 and relocating a hard dummy panel from the D4 bay to A4, torquing it down and fastening its ground strap to a standoff.]*

Assisted by CDR Volkov where necessary, the FE-2 then relocated the MELFI (Minus-Eighty Laboratory Freezer for ISS) rack from the US Lab (O4 bay) to the JPM (D4 bay). *[For the long-planned transfer to the Japanese Kibo, Gregory had to disconnect/reconnect umbilicals, remove fasteners, release capture mechanisms, disassemble braces, free the rack from its position, "fly" it to the JPM, install it at D4, perform post-transfer checkouts on the MELFI electronics box and PCS (Portable Computer System) laptop and reconfigure it and the rack for future use. Afterwards, temporarily removed items were to be restowed and everything cleaned up. Unlike the other racks, during the transfer MELFI was on a "thermal clock", viz.: once its internal Brayton motor (for cooling) was turned off, there was an 8-hr window to get the freezer rack turned on again. If problems cropped up during the relocation (e.g., with a QD/quick disconnect) which would have exceeded the window, the crew had a back-out plan to return the rack to LAB1O4 for reconnection.]*

Then, the FE-2 worked on the JPM's TCA (Thermal Control Assembly) Low Temperature Loop by repositioning its gas trap bypass valve for upcoming gas trap activities.

Also in the Kibo module, Gregory supported ongoing Marangoni Surface experimentation in the FPEF (Fluid Physics Experiment Facility), ground-

commanded from the SSIPC (Space Station Integration & Promotion Center) at Tsukuba/Japan, by activating the MMA (Microgravity Measurement Apparatus) and its laptop (MLT), first powering up the MMA's NCU/RSU (Network Control Unit/ Remote Sensor Unit) set from the Ryutai rack's UDC (Utility DC-to-DC Converter), then turning on both NCU/RSU and MLT. *[Tsukuba is conducting the Marangoni experiment basically only during crew sleep (for quiescence), starting again tonight until 10/16 (except for 10/9). Crewmembers can enter Kibo during the experiment but are advised not to cause any major disturbance of the micro-G environment.]*

Later, Chamitoff updated the three copies of the SODF (Systems Operation Data File) EMER-2 emergency books from the SM (Service Module), FGB and Lab. *[The books were updated with new pages on Fire Source Locations in Lab, COL (Columbus Orbital Laboratory) and JPM.]*

In the SM, FE-1 Kononenko performed the periodic download of protocol/log files of the BRI Smart Switch Router to the RSS1 laptop for subsequent dumping to the ground via OCA, for specialists to review performance parameters, then rebooted the RRS1. *[BRI is part of the RS OpsLAN network with connections to the three SSC clients, the relatively new Ethernet tie-in with the US network, and a network printer in the RS (Russian segment).]*

Continuing the current round of the monthly preventive maintenance of RS (Russian segment) ventilation systems, Volkov performed a 1h15m inspection and cleaning of Group A ventilator fans and grilles in the SM, while Kononenko a bit later conducted ventilation system maintenance in the DC1 (Docking Compartment) by cleaning the PF1 & PF2 dust collectors in its air duct system and the protective mesh screens of the V1 & V2 ventilator fans.

Greg Chamitoff took measurements for the regular atmospheric status check for $ppCO_2$ (Carbon Dioxide partial pressure) in the Lab, SM at panel 449 and COL (Columbus Orbital Laboratory) plus battery ticks, using the hand-held CDMK (CO_2 Monitoring Kit, #1002). The unit was then deactivated and returned to its stowage location (LAB1S2). *[Purpose of the 5-min activity is to trend with MCA (Major Constituents Analyzer), i.e., to correlate the hand-held readings with MCA measurements. Measurements were 0.47% in SM, 0.47% in US Lab, 0.46% in COL.]*

The FE-2 performed the periodic (monthly) battery check and reboot of all active US PCS (Portable Computer System) and the COL PWS (Portable Workstation) laptops.

Oleg performed the routine daily servicing of the SOZh system (ECLSS,

Environment Control & Life Support Systems) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Later, Kononenko also conducted the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The CDR & FE-1 had another 4h10m scheduled between them for stowage activities on Progress M-65/30P, going by an uplinked list of items to be discarded and their stowage locations. *[30P currently also contains liquid waste (urine), pumped to water tank BV1 from 8 EDV-U containers and to BV2 from 6 EDV-Us. Solid waste is stored in 10 KTO containers, besides discarded BKO & BRPK condensate hardware, 22 food ration containers, 12 used dust collector cartridges, a replaceable SPN pump unit, and other items of trash.]*

Oleg & Sergey each had the daily one-hour period to themselves for the regular crew departure preparations, working on the standard end-of-increment cleanup preparatory to their return to Earth later this month. *[It is usual for Russian crewmembers to be granted reduced workdays for making their departure preparations, as their return date approaches.]*

The crew completed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR/2.5h, FE-1/2.5h), and RED resistive exercise device (FE-2).

Later, the FE-2 is to transfer the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Afterwards, Gregory will be starting his first SOLO (Sodium Loading in Microgravity) session, which runs for five days. *[During this period, Chamitoff follows a special high-salt diet, for which prepared meals are provided onboard. All three daily meals will be logged on sheets stowed in the PCBA (Portable Clinical Blood Analyzer) Consumable Kit in the MELFI along with control solution and cartridges for the PCBA. SOLO, an ESA/German experiment from the DLR Institute of Aerospace Medicine in Cologne/Germany, investigates the mechanisms of fluid and salt retention in the body during long-duration space flight. Background: The hypothesis of an increased urine flow as the main cause for body mass decrease*

has been questioned in several recently flown missions. Data from the US SLS1/2 missions as well as the European/Russian Euromir `94 & MIR 97 missions show that urine flow and total body fluid remain unchanged when isocaloric energy intake is achieved. However, in two astronauts during these missions the renin-angiotensin system was considerably activated while plasma ANP concentrations were decreased. Calculation of daily sodium balances during a 15-day experiment of the MIR 97 mission (by subtracting sodium excretion from sodium intake) showed an astonishing result: the astronaut retained on average 50 mmol sodium daily in space compared to balanced sodium in the control experiment.]

At ~4:15am EDT, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~4:30am, the two cosmonauts linked up with TsUP-Moscow stowage specialists via S-band to conduct the weekly IMS tagup, discussing stowage issues and equipment locations.

At ~11:00am, Sergey, Oleg and Greg supported two live PAO TV interviews with US clients,- CBS News (Bill Harwood), and KHOU-TV "Great Day, Houston" (Deborah Duncan).

At ~3:55pm, the crewmembers will convene for their standard bi-weekly teleconference with the JSC Astronaut Office (Steve Lindsey), via S-band S/G-2 audio & phone patch.

As generally every day now, today starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) is being activated intermittently for two half-cycles to control $ppCO_2$ levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

WRM Update: An updated WRM (Water Recovery Management) "cue card" was uplinked overnight for the crew's reference, updated with yesterday's water audit. *[The new card (17-1016B) lists 29 CWCs (~962.3 L total) for the four types of water identified on board: technical water (283.2 L, for Elektron electrolysis, except for 22.2 L off-limit because of* Wautersia *bacteria), potable water (627.6 L, incl. 174.6 L currently on hold), condensate water (34.5 L), waste/EMU dump and other (17 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

New tasks currently on Greg Chamitoff's discretionary US "job jar" task list are –

- Labeling a new PMIC (Portable Microphone) & HHM (Hand-Held Microphone),
- Hard-wiring & reconfiguring the SSC-15 (Station Support Computer 15) laptop in the Kibo JPM for wireless operation via the new WAPs (Wireless Access Points), thus getting rid of the drag-through Ethernet cable (which could slow down rapid hatch closure); and
- Searching for MSG (Microgravity Science Glovebox) glove rings, then dividing them into old vs. new.

Reboost Planning: Planning for tomorrow's ISS reboost is underway, with details TBD. Attitude control authority handover to RS thrusters, for maneuvering to burn attitude and conduct the firing, is expected for 7:30am EDT, with return to US Momentum Management at ~8:30am.

Week 24 Scheduled Main Activities:

- Sat. (10/4): Station cleaning; SAMS activation; SOLO Diet monitor; ISS reboost (~7:45am EDT);
- Sun. (10/5): PFP-ODNT OBT/trng.; SODF updating.

CEO (Crew Earth Observation) photo targets uplinked for today were **Karakoram** *(this target area, NW of the Himalaya, is considered as one of the Greater Ranges of Asia. With over 60 peaks above 7,000m, it is also the most heavily glaciated area of the world outside the Polar Regions. ISS had a fair-weather pass before the start of the snow season in early afternoon sun. Looking left of track and trying for context views of this beautiful area using the short lens settings),* **Hurricane Ike Devastation** *(DYNAMIC EVENT: There is ongoing interest in views of the extent and impact of the recent devastation of the upper Texas coast by Hurricane Ike. Greg's early afternoon pass should have offered clear, oblique views of SE Texas as he tracked NE-ward over the Gulf, parallel to the coast. Using the long lens settings and looking left of track for extensive debris fields and possible coastline changes from the station's unique vantage point),* **Madrean Sky Islands** *(these ecologically diverse "islands" exist in the higher elevations of the mountain ranges of the Sonora desert of northwestern Mexico and the southwestern US. As ISS tracked NE-ward over the Baja Peninsula, Greg was to shoot right of track for oblique contextual views of this region using the short lens settings. Fair weather was anticipated),* and **Coral reefs, American Samoa** *(although much of this target area was to the right of track, Greg appeared to have an excellent late morning pass with only a few clouds. It should have provided nadir views of the islands of Western Samoa and Apia. Using the long lens settings and trying to map in detail the beautiful fringing reef structures of these islands)*.

CEO photography can be studied at this “Gateway” website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 8:45am EDT [= epoch]):
Mean altitude -- 352.0 km
Apogee height -- 356.2 km
Perigee height -- 347.7 km
Period -- 91.58 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006307
Solar Beta Angle -- -8.2 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 73 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56558

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
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11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*.
11/16/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC (~7:02pm EST) - *U/R*
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02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
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02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
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05/25/09 -- Soyuz TMA-15/19S launch

05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/02/08
Date:	Thursday, October 02, 2008 2:28:49 PM
Attachments:	

ISS On-Orbit Status 10/02/08

All ISS systems continue to function nominally, except those noted previously or below.

FE-1 Kononenko terminated the recharge of the power packs for the BAR instruments “Kelvin-Video” and TTM-2 anemometer/thermometer for the Russian KPT-12 science payload EXPERT, then continued experiment activity, which Volkov began on 9/30, with another ~3 hr session. *[Objective of EXPERT is to measure environmental parameters (temperature, humidity, air flow rate) and module shell surface temperatures behind SM (Service Module) panels and other areas susceptible to possible micro-destruction (corrosion), before and after insolation (day vs. night). The payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A) and a heat-loss anemometer/thermometer (TTM-2) to determine environmental data in specific locations and at specific times. Activities included documentary photography with the NIKON D2X camera and flash.]*

FE-2 Chamitoff, assisted by CDR Volkov, completed the transfer of the HRF-1 (Human Research Facility 1) rack from its US Lab position P2 to the ESA Columbus module, position F4. Having made the necessary umbilical connections and switched on rack power to enable testing, the FE-2 then performed the post-move checkout, supported by the ground (POIC/Payload Operation & Integration Center), and configured the rack’s PC1 laptop for later use. *[In addition, HRF-1 was set up for its use as a power source, which required utilization of a 28V power supply rather than the 120V supply to which it was previous connected. Rechecking all connections for proper seating, including the Ethernet plug-in on the back of the laptop, was to ensure two-way communication. The transfer of the MELFI rack from the Lab to the JAXA Kibo module is scheduled tomorrow. Three more racks will be relocated on 10/7.]*

Kononenko & Volkov had another 4:20h scheduled between them for stowage activities on Progress M-65/30P, going by an uplinked list of items to be discarded

and their stowage locations. *[30P currently also contains liquid waste (urine), pumped to water tank BV1 from 8 EDV-U containers and to BV2 from 6 EDV-Us. Solid waste is stored in 10 KTO containers, besides discarded BKO & BRPK condensate hardware, 22 food ration containers, 12 used dust collector cartridges, a replaceable SPN pump unit, and other items of trash.]*

The CDR started a new round of the periodic preventive maintenance of RS (Russian Segment) ventilation systems in the FGB (Funktsionalnyi-Grusovoi Blok), first removing & replacing the filter cartridges of the PS1 & PS2 dust collectors, then cleaning the grille of the TsV1 fan.

The FE-2 completed the weekly 10-min. CWC (Contingency Water Container) inventory as part of on-going WRM (Water Recovery & Management) assessment of onboard water supplies. Updated "cue cards" based on the crew's water calldowns are sent up every other week. *[The current card (17-1016A), being updated, lists 29 CWCs (~1047.5 L total) for the four types of water identified on board: technical water (326.2 L, for flushing only because of* Wautersia *bacteria), potable water (647.8 L, incl. 194.8 L currently on hold), condensate water (56.5 L), waste/EMU dump and other (17 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

Gregory also filled out the regular FFQ (Food Frequency Questionnaire), his 14th, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

Oleg performed the routine daily servicing of the SOZh system (ECLSS, Environment Control & Life Support Systems) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Later, the FE-1 also conducted the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Working in the JAXA Kibo module, Chamitoff removed & replaced a number of recording disks (#1025, #1026, #1027, #1028, #1029) of the IPU VRU (Image Processing Unit/Video Recording Unit), then performed troubleshooting of the used VRU #4 HDD (Hard Disk Drive), checking it for bent connector pins. *[If such were found, Greg was to photograph them and notify SSIPC (Space Station Integration & Promotion Center) at Tsukuba.]*

Oleg & Sergey had another hour each to themselves for the regular crew departure preparations, working on the standard end-of-increment cleanup preparatory to their return to Earth later this month. *[It is usual for Russian crewmembers to be granted reduced workdays for making their departure preparations, as their return date approaches.]*

The crew completed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR/2.5h, FE-1/2.5h), and RED resistive exercise device (FE-2).

Later, the FE-2 will be transferring the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

New tasks added to Greg Chamitoff's discretionary US "job jar" are –

- Labeling a new PMIC (Portable Microphone) & HHM (Hand-Held Microphone),
- Troubleshooting the FSL VMU (Fluid Science Laboratory/Video Management Unit) in the Columbus module (only if supported by all COL-CC console personnel),
- Exchanging WAICO1 ECs (Waving & Coiling of Arabidopsis Roots at Different g-levels/Experiment Containers) on Rotor B of the BLB INC (Biolab Incubator), which requires 2-hr. prior notification of COL-CC,
- Hard-wire installing & checking out SSC-15 (Station Support Computer 15) laptop in the Kibo JPM, and
- Searching for MSG (Microgravity Science Glovebox) glove rings, then dividing them into old vs. new.

ISS Reboost Cancellation: This morning's planned ISS reboost by Progress M-65/30P was cancelled shortly before its scheduled time due to a post-reboost conjunction conflict. *[Planning of the reboost maneuver originally looked at five options, each with its respective potential for creating a conjunction with Kosmos-*

2421 satellite pieces and other debris. The five options were then narrowed down to two with the least likelihood for a conjunction (they showed ~1 km radial miss distance). Both options were acceptable as of 24h before the reboost since they stayed out of the "forbidden" box, defined by 0.75 km radial miss distance, and both were pursued. But at about 2-3 h before the maneuver, the pieces' predicted flight paths had moved into the box, passing at ~0.71 km -- which triggered the cancellation for today. Backup date for the reboost is now 10/4 (Saturday), with all options being screened starting 48 hrs before. Significantly (fortunately), the cancellation occurred before attitude control authority was handed over to Russian MCS (Motion Control System). The purpose of the reboost is to set up orbital phasing for the 17S/16S Soyuz launch & landing. The number of conjunctions has increased in the recent past, both due to the Kosmos-2412 debris cloud and the currently unusually quiet sun with the resulting reduced atmospheric density at high altitudes causing less orbital drag, i.e., less orbit clean-up.]

Vozdukh Glitch: The Vozdukh CO_2 removal system in the RS (Russian Segment) failed this morning due to an operational "glitch" which, according to TsUP-Moscow, happens from time to time and is non-critical. The system was restarted nominally.

HRF-2 Leak Investigation: After the successful relocation of the HRF-2 rack to the Columbus module yesterday and its subsequent power-up, ground controllers noticed the water flow through the rack to be less than expected, and the rack did not pass the required vent leak check. COL-CC and payload experts are investigating and are also deferring the leak check on the HRF-1 rack, relocated today to Columbus.

MFCV Adjustment Update: The adjustment of the final MFCV (Manual Flow Control Valve), in the Lab Aft Endcone, deferred yesterday after Greg Chamitoff reported observing a spark when the Non-invasive Flow Meter touched metal ducting, will be rescheduled next week. After reviewing the Flow Meter and the BOB (Breakout Box) power unit, engineers determined that the equipment was not properly grounded. A workaround to ground the gear is under development. Lesson learned! *[Purpose of these valve adjustments is to optimize the ITCS (Internal Thermal Control System) flow throughout the USOS (US Segment) to allow for the incorporation of the Regenerative ECLSS to be launched on the ULF-2 mission.]*

Week 24 Scheduled Main Activities:

- Fri. (10/3): MELFI rack relocate & mate; CDMK chck.; BRI-RSS1 data dump; JPM Panels reconfig; RS Ventilation cleaning; 30P trash stow.
- Sat. (10/4): Station cleaning; SAMS activation; SOLO Diet monitor; ISS reboost (?);
- Sun. (10/5): PFP-ODNT OBT/trng.; SODF updating.

CEO (Crew Earth Observations) photo targets uplinked for today were **Western Pamirs** *(these remote, rugged mountains are located in north-central Tajikistan and range from 19,000 to 25,000 feet in elevation. They support ice fields feeding a number of long glaciers with handsomely banded moraine features and extensive rock glaciers evident in some valleys. ISS had a clear, nadir pass in late afternoon. Trying for a detailed mapping of one or more of the longer glacier features),* **Luquillo Forest, Puerto Rico** *(this Long Term Ecological Research [LTER] site is located on the northeastern tip of the island of Puerto Rico. On this midday pass with the target just right of track, Greg was to try simply for a few short-lens context views of the area),* and **Palmerston Island reef, central South Pacific** *(this oddly shaped atoll is located in the tropical south Pacific over 2,500 miles south of the Hawaiian Islands. The lagoon is about seven miles across. As part of an international inventory and monitoring effort of the Earth coral reef resources, CEO researchers are seeking detailed, near-nadir views of the coral reef structures of this atoll system. ISS had a near-nadir pass in late morning with partly cloudy skies expected)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 11:42am EDT [= epoch]):
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Perigee height -- 347.9 km
Period -- 91.58 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006225
Solar Beta Angle -- -3.2 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 88 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56544

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
10/04/08 -- ISS Reboost (under review)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Fincke, Lonchakov, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/24/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) & landing
11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*.
11/16/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC (~7:02pm EST) - *U/R*
11/18/08 -- STS-126/Endeavour/ULF2 docking - *U/R*

11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.)
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 10/01/08
Date:	Wednesday, October 01, 2008 12:58:25 PM
Attachments:	

ISS On-Orbit Status 10/01/08

All ISS systems continue to function nominally, except those noted previously or below.

>>>Happy Golden Anniversary, NASA! Keep on trekking! <<<

As part of the crew's regular morning inspection tour, CDR Sergey Volkov conducted the routine checkup of DC1 (Docking Compartment) circuit breakers and fuses. *[The monthly checkup in the "Pirs" module looks at AZS circuit breakers on the BVP Amp Switch Panel (they should all be On) and the LEDs (light-emitting diodes) of 14 fuses in fuse panels BPP-30 & BPP-36.]*

After yesterday's preparations for today's rack relocation, FE-2 Chamitoff, assisted by the CDR, moved the HRF-2 (Human Research Facility 2) rack from its Lab position P4 to the Columbus module, position A4. Having made the necessary umbilical connections and switched on rack power, the FE-2 then performed the post-move checkout, supported by the ground (POIC/Payload Operation & Integration Center), and configured the rack's PC2 laptop for later use. .

For the two Russian crewmembers, it was time today for their first orthostatic hemodynamic endurance test session with the Russian Chibis suit in preparation for their return to gravity on 10/24, conducting the MedOps MO-4 exercise protocol in the below-the-waist reduced-pressure device (ODNT, US: LBNP/Lower Body Negative Pressure). Assisting each other in turn as CMO (Crew Medical Officer), the subjects were supported in their two one-hour sessions by ground specialist tagup via VHF at 6:38am (DO16) & 8:13am EDT (DO1). *[The Chibis provides gravity-simulating stress to the body's cardiovascular/circulatory system for evaluation of Malenchenko's orthostatic tolerance (e.g., the Gauer-Henry reflex) after 200 days in zero-G. Data output includes blood pressure readings.]*

FE-2 Chamitoff collected the periodic microbiological surface samples with the SSK (Surface Sample Kit) in the SM, Node-1 (at the location where the crew dries their clothing), US Lab and JAXA Kibo JPM (JEM Pressurized Module). *[Bacterial and fungal air samples are usually taken at two locations in the module being checked. The samples are then analyzed after 5-days of incubation. For onboard visual analysis of media slides, the crew has a procedure for visual inspection of samples for bacterial and fungal colony growths after appropriate incubation periods.]*

Gregory also unstowed the three copies of the SODF (Systems Operation Data File) Warning Book from the Lab, SM (Service Module) and FGB, to make P&I (pen & ink) updates reflecting the completion of OGA (Oxygen Generation Assembly) and OGS (Oxygen Generation System) installation.

Later, the FE-2 worked on the OGS in the Lab, reconfiguring its SPS (Secondary Power System).

Sergey Volkov conducted the periodic (about twice a month) replenishing of the Elektron's water supply for electrolysis, filling the KOV thermal loops' EDV container with purified water from CWCs (Contingency Water Containers, #1074) collected by the U.S. CCAA (Common Cabin Air Assembly) dehumidifier. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron micropump shutdown.]*

Today it was Greg Chamitoff's turn to undergo the monthly CMO (Crew Medical Officer) proficiency training on using HMS (Health Maintenance System) hardware including ACLS (Advanced Cardiac Life Support) equipment which may be used in contingency situations where crew life is at risk. *[To maintain proficiency, the CMOs spend one hour per month reviewing HMS and ACLS equipment and procedures via the HMS CBT (Computer Based Training) and the ACLS CBT. Maintaining proficiency with the HMS hardware and procedures is essential to successful ISS operations and well-being of the crew.]*

Oleg Kononenko set up the power packs for the BAR instruments "Kelvin-Video" and TTM-2 for charging for another operational run of the Russian KPT-12/EXPERT science payload after yesterday's session. Charging will be terminated tomorrow (10/2), and data taking will be continued in a second session. *[Objective of EXPERT is to measure environmental parameters (temperature, humidity, air flow rate) and module shell surface temperatures behind SM panels and other areas susceptible to possible micro-destruction (corrosion), before and after insolation (day vs. night). The payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A) and a heat-loss anemometer/thermometer (TTM-2) to determine environmental data in specific locations and at specific times. Activities*

include documentary photography with the NIKON D2X camera and flash.]

The Elektron electrolysis machine, turned off yesterday due to the temporary deactivation of the BITS2-12 onboard telemetry measurement system for the replacement of the BRPK separator in the SRVK-2M condensate water processor, was reactivated today at 32 amps, supported by Kononenko, who monitored the external temperature of its secondary purification unit (BD) for the first 10 minutes of operations to ensure that there was no overheating. *[The gas analyzer used on the Elektron during nominal operations for detecting hydrogen (H_2) in the O_2 line (which could cause overheating) is not included in the control algorithm until 10 minutes after Elektron startup.]*

As has become standard operating procedure after deactivation/reactivation of the BITS2-12 onboard measurement telemetry system and VD-SU monitoring mode, Oleg also performed a quick function verification of the relatively new SUBA Ethernet connection between the OpsLAN (Operations Local Area Network) and the BRI Smart Switch Router in the SM.

The FE-1 had 1:45h reserved for stowage activities on Progress M-65/30P, going by an uplinked list of items to be disposed and their stowage locations. *[30P currently also contains liquid waste (urine), pumped to water tank BV1 from 8 EDV-U containers and to BV2 from 6 EDV-Us. Solid waste is stored in 10 KTO containers, besides discarded BKO & BRPK condensate hardware, 22 food ration containers, 12 used dust collector cartridges, a replaceable SPN pump unit, and other items of trash.]*

Oleg & Sergey also had an hour each for the regular crew departure preparations, starting to get ready for their return to Earth later this month. *[This week they are granted reduced workdays for making their departure preparations, as is usual for Russian crewmembers.]*

The CDR conducted the routine daily servicing of the SOZh system (ECLSS, Envireonment Control & Life Support Systems) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The FE-1 later performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew completed their physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), and RED resistive exercise device (FE-2). For Sergey & Oleg, the MO-4 Chibis exercises replaced part of their regular workouts today.

Later, the FE-2 will transfer the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~10:05am EDT, the crew downlinked a message of greetings to an ESA/DLR space "gala" at the Sinsheim-Speyer Museum in Germany, going through the ESA Gateway via Col-CC (Columbus Control Center) in Oberpfaffenhofen. *[The privately-financed space museum at Speyer today opened its spectacular new Buran Hall to the public, exhibiting the flight test model of the Soviet space shuttle "Buran" (Blizzard), recently purchased from Russia and transported from Bahrain on a special ship. Total investment in the Buran exhibit, incl. hall: 10 million Euros. Anyone has a Soyuz capsule for sale? They're interested.]*

SHERE Science Program: With the last two runs of the SHERE (Shear History Extensional Rheology Experiment) experiment yesterday, Greg Chamitoff has successfully completed the 20 runs desired for Increment 17. Thanks and congratulations went up to the FE-2 from the SHERE PI & engineering teams, both of which are "ecstatic over the result". *[SHERE is designed to investigate the effect of preshearing (rotation) on the stress and strain response of a polymer fluid being stretched in microgravity.]*

MFCV Adjustments: Yesterday, after the FE-2 had successfully performed two of the three remaining MFCV (Manual Flow Control Valve) adjustments in the US Lab (at P3 & O6), the adjustment of the final valve, in the Lab Aft Endcone, had to be deferred after Chamitoff reported observing a spark when the Flow Meter touched the metal ducting in the D6-O3 location, apparently from the screws on the transducer. Engineers are investigating the anomaly. *[Purpose of these valve adjustments is to optimize the ITCS (Internal Thermal Control System) flow throughout the USOS (US Segment) to allow for the incorporation of the Regenerative ECLSS to be launched on the ULF-2 mission.]*

ISS Reboost Preview: Tomorrow's ISS reboost by Progress M-65/30P is scheduled for a TIG (Time of Ignition) of 7:33am EDT and duration of 4min 41s, to yield an expected delta-V of 0.7 m/s (2.3 ft/s). Projected mean altitude increase is 1.2 km (0.7 n.mi.). The purpose of the reboost is to set up orbital phasing for the 17S/16S Soyuz launch & landing.

Week 24 Scheduled Main Activities:

- Thu. (10/2): Progress reboost (7:33am); HRF-1 relocate & mate; 30P trash stow; KPT-12 expmt.; RS Ventilation cleaning; WRM CWC audit.
- Fri. (10/3): MELFI rack relocate & mate; CDMK chck.; BRI-RSS1 data dump; JPM Panels reconfig; RS Ventilation cleaning; 30P trash stow.
- Sat. (10/4): Station cleaning; SAMS activation; SOLO Diet monitor.
- Sun. (10/5): PFP-ODNT OBT/trng.; SODF updating

CEO (Crew Earth Observations) photo targets uplinked for today were **Vredefort Impact Crater, South Africa** *(Vredefort is the largest confirmed impact crater that has been discovered on Earth so far. The original size of this ancient crater [approximately 2 billion years] is believed to have been 250 km in diameter. While Greg has already taken excellent detail images of the Vredefort structure, researchers now asked him to take context views of the entire crater with the 50 mm lens. Weather satellites suggested that clouds should not obscure the view),* **South Tibesti Megafans, Chad** *(these subtle, ancient erosional features in the Sahara are located between Lake Chad to the south and closer to the southern flank of the rugged Tibesti Mountains to the north. Requested were short-lens oblique views of the region for use later to help pinpoint areas for more detailed shots. After crossing to the W of Lake Chad, Greg was to begin shooting broad mapping views of the area to the right of track until ISS reached the mountains),* **Post-Ike Survey, Upper Texas Coast** *(Dynamic Event: This is the first time that the ISS orbit allowed for context views of the upper Texas coast after the passage of Hurricane Ike. Looking left of track towards the coast. CEO researchers received numerous requests through PAO for post-Ike imagery. Greg's context views of the upper coast using the 800 mm lens may allow for comparisons of shoreline erosion to pre-Ike imagery. The imagery can also complement satellite images that have also been requested. With the passage of a cold front it was hoped that clouds were not a factor. Image taking was to be continued over the Mississippi delta so that post-Hurricane Gustav coastal changes were documented as well),* and **Sevilleta Wildlife Area, New Mexico** *(this wildlife area is also designated as a Long Term Ecological Research [LTER] site. It is primarily situated near either side of the Rio Grande River in central New Mexico. Detailed, mapping views along the orbit track were requested)*.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 7:56am EDT [= epoch]):
Mean altitude -- 352.1 km
Apogee height -- 356.4 km
Perigee height -- 347.9 km

Period -- 91.58 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006331
Solar Beta Angle -- 1.7 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 67 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56525

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
10/02/08 -- ISS Reboost (~0.7 m/s; 7:33am EDT)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Fincke, Lonchakov, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/24/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) & landing
11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*.
11/16/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC (~7:02pm EST) - *U/R*
11/18/08 -- STS-126/Endeavour/ULF2 docking - *U/R*
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.)
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/30/08
Date:	Tuesday, September 30, 2008 2:45:13 PM
Attachments:	

ISS On-Orbit Status 09/30/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Volkov, FE-1 Kononenko and FE-2 Chamitoff began their workday before breakfast with the periodic session of the Russian biomedical routine assessments PZEh-MO-7/Calf Volume Measurement. *[Calf measurements (left leg only) are taken with the IZOG device, a custom-sewn fabric cuff that fits over the calf, using the knee and lower foot as fixed reference pints, to provide a rough index of deconditioning in zero-G and effectiveness of countermeasures.]*

The CDR serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out"-to-vacuum cycle on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~4:15pm EDT. Filter bed #1 was regenerated yesterday. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time: 9/22 & 9/23).]*

For the Russian KPT-12 science payload EXPERT, the CDR terminated charging of the power packs for the BAR instruments "Kelvin-Video" and TTM-2 anemometer/ thermometer, then conducted the experiment for the next 2.5 hrs. *[Objective of EXPERT is to measure environmental parameters (temperature, humidity, air flow rate) and module shell surface temperatures behind SM (Service Module) panels and other areas susceptible to possible corrosion, before and after insolation (day vs. night). The payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A) and a heat-loss anemometer/thermometer (TTM-2) to determine environmental data in specific locations and at specific times. Activities included documentary photography with the NIKON D2X camera and flash.]*

Afterwards, Volkov & Kononenko completed a session with the ESA experiment

NOA1 (Nitric Oxide Analyzer, MBI-21), Sergey's fifth, Oleg's fourth, filling in the electronic log book on the RSE1 laptop for downlink and restowing the hardware. During the session, each subject took two NO (Nitric Oxide) measurements in exhaled air. *[Purpose of the ESANO1 experiment, consisting of the "Platon" analyzer and its power supply, is to monitor expired NO in the subject's exhaled air to detect signs of airway inflammation and indications of venous gas emboli (bubbles) that may be caused by inhalation of pollutants in the closed environment of the ISS cabin and increased risk of decompression sickness.]*

The FE-1 performed CSA-CP (Compound Specific Analyzer-Combustion Products) maintenance, first replacing the battery of the four units (#1382 being prime), then conducting the usual zero-calibration. *[The sampling pumps used for the checkout measurements and the backup CSA-CPs were returned to their Node-1 and -2 locations.]*

In preparation for the planned relocations of the HRF (Human Research Facility) racks tomorrow (10/1) & 10/2 from the US Lab to the ESA COL (Columbus Orbital Laboratory), Gregory Chamitoff cleared stowage items from the rack fronts at the Lab S2 & P4 locations and from the empty rack bays F4 & A4 in COL, the new locations for HRF-1 & -2. *[Preparations included removing any protruding items from the 50in x 72in. translation path needed for the rack transfer. Cables were to be temporarily rerouted as necessary, and stowage items will be returned after the rack move.]*

Chamitoff also completed the periodic relocation of the TEPC (Tissue Equivalent Proportional Counter) detector assembly, the primary radiation measurement tool in the ISS, from the JAXA JPM (JEM Pressurized Module) 1A5 location to the SM (panel 338). *[The FE-2 also photo-documented the current state of the TEPC power/data cable which he had covered with fresh Kapton tape on 8/24 to contain any FOD (Foreign Object/Debris). TEPC had been relocated to the JPM by Greg on 8/24.]*

Afterwards, Gregory disassembled still remaining BCAT-3 (Binary Colloidal Alloy Test-3) payload equipment and stowed the hardware.

In the JAXA Kibo laboratory, the FE-2 powered off the MMA (Microgravity Measurement Apparatus) and its laptop (MLT), by first deactivating the MMA's NCU/RSU (Network Control Unit/Remote Sensor Unit), powered since 9/25 from the Ryutai rack's UDC (Utility DC-to-DC Converter) unit.

In the Soyuz TMA-12/16S crew return vehicle, Sergey, Oleg and Greg conducted once again the standard 30-min. fit check of the Kazbek couches, the contoured shock absorbing seats in the Descent Module (SA) of the spacecraft docked at the

DC1 Docking Compartment. (Last time done: 6/24). *[For the fit check, crew members remove their cabin suits and don Sokol KV-2 suit and comm caps, get into in their seats and assess the degree of comfort & uniform body support provided by the seat liner. Using a ruler, they then measure the gap between the top of the head and the top edge of the structure facing the head crown. The results are reported to TsUP-Moscow. Kazbek-UM couches are designed to withstand g-loads during launch and orbital insertion as well as during reentry and brake-rocket-assisted landing. Each seat has two positions: cocked (armed) and noncocked. In cocked position, they are raised to allow the shock absorbers to function during touchdown. The fit check assures that the crewmembers, whose bodies gain in length during longer-term stay in zero-G, will still be adequately protected by the seat liners for their touchdown in Kazakhstan, either emergency or regular return.]*

Volkov performed regular maintenance on the SRVK-2M condensate water processor, replacing one of the two BRPK separators with a new spare. The old unit was discarded as trash.

The CDR also transferred US condensate, generated by the Lab CCAA (Common Cabin Air Assembly) dehumidifier and collected in a CWC (Contingency Water Container, #1070), to a Russian EDV container, while monitoring the time it took for the pump to fill the latter (in order to evaluate the performance of the US filter used).

Gregory worked on completing the ITCS MFCV (Internal Thermal Control System/ Manual Flow Control Valve) adjustments in the US Lab, using the Non-intrusive Flow Meter powered from the Shuttle BOB (Breakout Box), instead of batteries. *[After adjusting the MFCVs in the Lab Forward End/cone and behind the O3 rack yesterday, Greg today dealt with the MFCVs at the P3, O6 & S6 rack locations (for which the racks were rotated out of the way yesterday. Later, BOB was torn down and stowed again. The MFCV adjustments in the Lab are in preparation for the future Regenerative ECLSS (Environment Control & Life Support System).]*

Sergey Volkov undertook his monthly CMO (Crew Medical Officer) proficiency training on using HMS (Health Maintenance System) hardware including ACLS (Advanced Cardiac Life Support) equipment which may be used in contingency situations where crew life is at risk. *[To maintain proficiency, the CMOs spend one hour per month reviewing HMS and ACLS equipment and procedures via the HMS CBT, and CBT (Computer Based Training (CBT) and the ACLS CBT. Maintaining proficiency with the HMS hardware and procedures is essential to successful ISS operations and well-being of the crew.]*

In preparation for the Progress 30P reboost on 10/2 (Thursday), the CDR set up

and configured the IWIS RSUs (Internal Wireless Instrumentation System Remote Sensor Units) in the Lab, Node-1, Node-2, FGB (#1035) and SM (#1028), then programmed the timing of the IWIS ICU (Interface Control Unit) for the automated activation on 10/2 (start time 6:20am EDT). *[IWIS will monitor dynamic/vibrational responses of the ISS structure during the reboost thrusting, measured by RSUs which transmit their measurements via radio to the central NCU (Network Control Unit). Structural vibrational data will also be taken by the SDMS (Structural Dynamic Measurement System).]*

Oleg meanwhile conducted the routine daily servicing of the SOZh system (ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Later, Sergey performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

With the SHERE (Shear History Extensional Rheology Experiment) science program almost finished for his Increment, Greg Chamitoff had volunteered for another VolSci (Voluntary Science) activity today to complete the last two remaining SHERE test points, for which he –

- Activated the MSG (Microgravity Science Glovebox) from the A31p laptop,
- Powered on the SHERE hardware,
- Accessed the CGBA (Commercial Generic Bioprocessing Apparatus) to install the SHERE FM (Fluid Module) #20;
- Supported the first SHERE experiment run (Test Point 14);
- Transferred the module with the fluid sample,
- Installed FM #16 for the second experiment run (Test Point 15);
- Removed the FM from the CGBA, followed by SHERE data transfer;
- Turned off the SHERE/CGBA equipment;
- Transferred the data files to the MSG laptop for subsequent downlink, and
- Powered down the MSG.

[Background: Rheology is the study of the deformation and flow of matter under the influence of an applied stress (“preshearing” = rotation) which might be, for example, a shear stress or extensional stress. In practice, rheology is principally concerned with extending the "classical" disciplines of elasticity and (Newtonian) fluid mechanics to materials whose mechanical behavior cannot be described with the classical theories. SHERE is designed to study the effect of preshear (rotation) on the transient evolution of the microstructure and viscoelastic tensile stresses for solutions with long chains of monodisperse dilute polymer molecules in the MSG. Collectively referred to as “Boger fluids,” these polymer solutions have become a

popular choice for rheological studies of non-Newtonian fluids and are the non-Newtonian fluid used in this experiment. The SHERE hardware consists of the Rheometer, Camera Arm, Interface Box, Cabling, Keyboard, Tool Box, Fluid Modules, and Stowage Tray.]

Chamitoff completed another one of the periodic inspections of the RED (Resistive Exercise Device) canister cords and accessories, currently done every two weeks.

Later today, the FE-2 is scheduled to take down and stow the UOP DCP (Utility Outlet Panel/Display & Control Panel) bypass power cable to the VTR (Video Tape Recorder) at the Lab CUP RWS (Cupola Robotics Work Station).

Also late tonight, Gregory will retrieve and stow the four passive FMK (Formaldehyde Monitoring Kit) sampling assemblies deployed by him on 9/28 in the Lab (at P3, below CEVIS) and SM (at the most forward handrail, on panel 307), to catch any atmospheric formaldehyde on a collector substrate for subsequent analysis on the ground. *[Two monitors each are usually attached side by side, preferably in an orientation with their faces perpendicular to the direction of air flow.]*

The crew completed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), and RED resistive exercise device (CDR, FE-1, FE-2).

Later, Volkov will transfer the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

The crew had their regular PMCs (Private Medical Conferences), via S-band/audio & Ku-band/video, Sergey at ~10:10am, Oleg at ~10:25am, Greg at ~2:40pm.

COL False Fire Alarm: Yesterday, a smoke detector (SD1) in the Columbus module erroneously annunciated an emergency, probably triggered by some dust particles floating close to the sensor. Since no controlled air flow was in place at the time (due to an ongoing air loop characterization test), the SD1 reading was not reliable, and a False Fire alarm was declared. SD readings went back to nominal after 10 seconds, and no further suspect behavior was detected afterwards.

VolSci Program Preview: For the weekend ahead (10/4-5), Greg Chamitoff was offered three choices for the Voluntary Weekend Science program: (1) an operations improvement session with SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellites) with all three satellites; (2) a LOCAD-

PTS (Lab-On-A-Chip Application Development – Portable Test System) surface sampling session in COL using Glucan LAL cartridges, targeting fungus on ISS surfaces; and (3) an EPO (Education Payload Operations) session with "Buzz Lightyear", to shoot a video of the Buzz Lightyear doll demonstrating working aspects of working and living in the space environment by showing how micro-G affects familiar objects and activities.

Week 24 Scheduled Main Activities:

- Wed. (10/1): HRF-2 relocate & mate; 30P trash stow; MO-4; SODF updates; REGUL-Paket reconfig.; Crew Departure preps.; OGS Power reconfig.
- Thu. (10/2): Progress reboost; HRF-1 relocate & mate; 30P trash stow; KPT-12 expmt.; RS Ventilation cleaning; WRM CWC audit.
- Fri. (10/3): MELFI rack relocate & mate; CDMK chck.; BRI-RSS1 data dump; JPM Panels reconfig; RS Ventilation cleaning; 30P trash stow.
- Sat. (10/4): Station cleaning; SAMS activation; SOLO Diet monitor.
- Sun. (10/5): PFP-ODNT OBT/trng.; SODF updating

CEO (Crew Earth Observations) photo targets uplinked for today were **Yellow River Delta** *("The Mother River" of China empties into the Bohai Sea on the northeastern coast. The dynamic nature of the river's delta is the focus of interest for this target. As ISS approached it from the SW in mid-afternoon light, Greg should have had a nadir pass in fair weather. Trying to acquire a seasonal, low water view of the delta),* **Lake Nasser, Toshka Lakes, Egypt** *(Greg recently acquired a number of excellent context views of this target area located in the desert just west of the Aswan Dam and Lake Nasser. On this early-afternoon pass in clear weather he should have had a nadir view. This time trying for a detailed long lens view of the recent human development near the lake, i.e. agriculture, roads, canals),* **Red River Basin, TX** *(CEO researchers are continuing to document and monitor land use patterns and change in this still largely agricultural area. Greg's pass was in mid-afternoon sun and fair weather. Since most of the area is left of track, researchers requested a short-lens contextual mapping from W to E as ISS approached and crossed from the SW),* and **Santa Barbara Coast, California** *(this Long-term Ecological Research site [LTER] is located on the southern California coast NW of the Los Angeles area. On this mid-afternoon pass in fair weather, Greg was to look just left of track and attempt a detailed mapping strip of the Santa Inez River valley from Lompoc to Lake Cachuma)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 4:54am EDT [= epoch]):
Mean altitude -- 352.2 km
Apogee height -- 356.5 km
Perigee height -- 347.9 km
Period -- 91.58 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.000634
Solar Beta Angle -- 6.7 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 74 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56508

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
10/01/08 -- **NASA 50 Years**
10/02/08 -- ISS Reboost (~1.8 m/s; 6:25am EDT)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Fincke, Lonchakov, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/24/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) & landing
11/02/08 -- Progress 30P reboost; *Daylight Saving Time (DST) ends*.
11/16/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC (~7:02pm EST) - *U/R*
11/18/08 -- STS-126/Endeavour/ULF2 docking - *U/R*
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.)
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2

12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/29/08
Date:	Monday, September 29, 2008 12:39:35 PM
Attachments:	

ISS On-Orbit Status 09/29/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 24 of Increment 17.*

At 9:31am EDT, the ATV (Automated Transfer Vehicle) “Jules Verne” entered the atmosphere at an altitude of 120 km, breaking up at ~75 km and splashing into the Pacific Ocean about 12 minutes later.

FE-2 Chamitoff ended his fifth run (FD120) with the NASA/JSC experiment NUTRITION w/Repository by collecting a final urine sample upon wakeup for storage in the MELFI (Minus-Eighty Laboratory Freezer for ISS). The sampling kit was then stowed away. His next NUTRITION activity will be the FD180 session. *[The current NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

CDR Volkov performed the periodic maintenance of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The process will be terminated at ~4:15pm EDT and Bed #2 regeneration performed tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP’s regeneration cycle, normally done every 20 days, is currently performed four times more frequently (last time: 9/16 & 9/17).]*

Volkov also had ~90 min set aside for the periodic equipment servicing in the SM’s ASU toilet facility, changing out replaceable parts with new components, e.g., a filter

insert (F-V), the pretreat container (E-K), and the E-K's hose. All old parts were discarded as trash. *[E-K contains five liters of pre-treat solution, i.e., a mix of H_2SO_4 (sulfuric acid), CrO_3 (chromium oxide, for oxidation and purple color), and H_2O (water). The pre-treat liquid is mixed with water in a dispenser (DKiV) and used for toilet flushing.]*

FE-1 Kononenko performed IFM (Inflight Maintenance) and functionality checks on the Russian VELO cycle ergometer (VB-3), replacing parts of the cycle's generator and reassembling the exercise device's generator unit with its noise-suppressing rubber-metal bushings, then configuring it for operation.

FE-2 Chamitoff set up the video equipment in the Japanese JPM (JEM Pressurized Module) and later recorded some footage for JAXA.

Continuing the extended leak checking of the spare BZh Liquid Unit (#056) for the Elektron O_2 generator, Oleg Kononenko charged the unit once again with pressurized N_2 from the BPA Nitrogen Purge Unit (#23) to 1 atm (1 kg/cm^2). The last test pressurization to monitor for leakage was on 7/20. *[Objective of the checkout of the BZh, which has been in stowage for almost 2 years, was to check for leakage and good water passage through the feed line inside of the BZh (from ZL1 connector to the buffer tank) and to check the response of the Electronics Unit's micro switches (signaling "Buffer Tank is Empty" & "Buffer Tank is Full". During Elektron operation, the inert gas locked up in the BZh has the purpose to prevent dangerous O_2/H_2 mixing. A leaking BZh cannot be used.]*

In preparation for brief Progress thruster firings at ~9:20am EDT, Chamitoff closed the protective shutters of the science window in the JAXA JPM and U.S. Lab. *[The firings were in support of the ATV "Jules Verne" viewing activity with the Russian GFI-1 Relaksatsiya equipment. For the experiment, ISS attitude control authority was handed over to Russian MCS (Motion Control System) at 9:10am and returned to US Momentum Management at ~10:10am. The Lab window could then be re-opened two orbits later, at ~1:10pm.]*

The FE-1 set up the Fialka-MV-KOSMOS hardware of the GFI-1 RELAXATION experiment hardware at SM window #9 and used its UV (ultraviolet) camera and spectrometer, controlled from Laptop 3, to record relaxation process imagery & plasma spectra of the ATV's fiery entry in the Earth's atmosphere at 9:31am EDT. Afterwards, Oleg tore down and stowed the hardware. *[The return of ESA's first logistics vehicle began with a deorbit burn of 70 m/s delta-V at 8:58am. ATV1 breakup started at an altitude of about 75 km, with the remaining fragments splashing into the Pacific Ocean some 12 min later.]*

After clearing the rotation paths of four racks (D1, P3, O6, S6) in the US Lab and configuring the settings (viscosity readings) of the Non-intrusive Flow Meter, Gregory Chamitoff worked on adjusting the ITCS MFCVs (Internal Thermal Control System/Manual Flow Control Valves) in the Lab Forward Endcone and behind the P3 and O3 racks. *[The MFCV adjustments in the Lab with the battery-driven non-intrusive Flow Meter are in preparation for the future Regenerative ECLSS (Environment Control & Life Support System). Working in the Fwd Endcone required partial-to-full rotation of the D1 rack and removal of the OGS WDS (Oxygen Generation System/Water Delivery System), D1 SD (Smoke Detector) and demating of ISL (Integrated Station OpsLAN) Ethernet cabling. For accessing the MFCV behind the rotated P3 rack required removal of the CEVIS, and for getting behind the rotated O6 rack, Greg had to remove stowage from the Bay 6 area.]*

Sergey Volkov performed the periodic inspection & cleaning of the FDS (Fire Detection & Suppression) system's bacteria filters and SDs (smoke detectors) in the US Airlock (one SD), Node-1 (2 SDs) and Lab (2 SDs). After removing the closeouts in Node-2 (2 SDs) for the cleaning, the CDR removed SD #2 and replaced it with a new spare, taking documentary photography of the SD connectors afterwards.

After temporarily turning off the SRVK-2M Condensate Processor behind panel 436 in the SM, Oleg installed a "residue-trap" insert in the condensate hose upstream of the Processor's inlet. *[Purpose: to collect and provide visual monitoring of sediments brought in with the condensate from the BRPK-1/2 (Condensate Separator & Pumping Unit), downstream from the BKO Multifiltration Unit and the BKV Water Conditioning Unit (which treats the condensate water with salts for taste and silver ions for preservation.]*

Afterwards, Kononenko took the periodic readings of potentially harmful atmospheric contaminants in the SM, using the CMS (Countermeasure System), a component of the SKDS GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, today using preprogrammed microchips to measure for Isopropanol ("rubbing alcohol", C_3H_8O), Methanol ("wood alcohol", CH_3OH) and Toluene (methylbenzene, C_7H_8).

The FE-1 completed the periodic collection of air samples in the SM & FGB using the AK-1M sampler kit, recording date, time & location. A second sample for Freon-210 was taken in the SM with the AK-1M-F. Kits and pouches were then restowed.

Kononenko also conducted the periodic atmospheric sampling in the center of the Lab, SM and COL (Columbus Orbital Laboratory) with the U.S. GSC (Grab Sample

Container), using GSCs #1038, #1011, and one 30P-delivered GSC.

Additionally, Oleg performed the periodic checkout/verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the passageways SM PrK (Transfer Compartment) – RO (SM Working Compartment), PkhO (SM Transfer Tunnel) – RO, PkhO – DC1, PkhO – FGB PGO, FGB PGO – FGB GA, and FGB GA–Node-1.

The CDR meanwhile conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Sergey also took care of the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew completed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR/2.5h, FE-1/2.5h), and RED resistive exercise device (FE-2).

Later, Volkov will transfer the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Sergey set up the TTM-2 and "Kelvin-Video" batteries for charging for another operational run of the Russian KPT-2 "Expert" science payload BAR-RM. Charging will be terminated tomorrow (9/30), followed by closeout ops and re-stowing. *[Payload objective is to experiment with ISS leak detection based on environmental data anomalies (temperature, humidity, and ultrasound emissions) at leak locations. The payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/thermometer (TTM-2), an ultrasound analyzer (AU-01), and a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station. Measurements are to be taken in specific zones (13 in SM PkhO and 4 in DC1), both with lights & fans turned on and off.]*

Week 24 Scheduled Main Activities:

- Tue. (9/30): MO-7; BMP ch.2 regen; TEPC relocate; NOA1 exp.; RED inspect.; IWIS reprog.; Node-1 RFCA Flowmeter test, ITCS MTL (MFCV) adjust, A/L MTL Flowmeter meas.; FMK stow; Kazbek fit checks; crew dep. preps.
- Wed. (10/1): HRF-2 relocate & mate; 30P trash stow; MO-4; SODF updates; REGUL-Paket reconfig.; Crew Departure preps.; OGS Power reconfig.
- Thu. (10/2): HRF-1 relocate & mate; 30P trash stow; KPT-12 expmt.; RS Ventilation cleaning; WRM CWC audit.
- Fri. (10/3): MELFI rack relocate & mate; CDMK chck.; BRI-RSS1 data dump; JPM Panels reconfig; RS Ventilation cleaning; 30P trash stow.
- Sat. (10/4): Station cleaning; SAMS activation; SOLO Diet monitor.
- Sun. (10/5): PFP-ODNT OBT/trng.; SODF updating

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 6:02am EDT [= epoch]):
Mean altitude -- 352.3 km
Apogee height -- 356.6 km
Perigee height -- 348.0 km
Period -- 91.58 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.000643
Solar Beta Angle -- 11.5 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 70 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56493

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
10/01/08 -- **NASA 50 Years** (official)
10/02/08 -- ISS Reboost (~1.8 m/s)
10/14/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4) 12:33am
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/24/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) & landing
11/02/08 -- Progress 30P reboost
11/16/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC (~7:02pm EST)

11/18/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.)
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/28/08
Date:	Sunday, September 28, 2008 12:37:24 PM
Attachments:	

ISS On-Orbit Status 09/28/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – off-duty day for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff. Ahead: Week 24 of Increment 17.*

Gregory Chamitoff started out on Part 2 of his FD120 (Flight Day 120) session with the NASA/JSC experiment NUTRITION w/Repository. This is an all-day session, the fifth for Greg, of collecting urine samples several times for 24 hrs through first void tomorrow morning, labeling each sample and storing it in the MELFI (Minus Eighty Degree Laboratory Freezer for the ISS), Dewar 1 Tray B/Section 1. *[The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by supercold MELFI dewars), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

Chamitoff also had three hours reserved for his part of the regular weekly station cleaning in the USOS (US Segment) which was not scheduled yesterday alongside the RS (Russian Segment) “uborka” housecleaning by his two crewmates due to his VolSci (Voluntary Science) program.

Sergey Volkov conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM (Service Module), including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The FE-2 performed the periodic deployment of four passive FMK (Formaldehyde Monitoring Kit) sampling assemblies in the Lab (at P3, below CEVIS) and SM (at the most forward handrail, on panel 307) for two days, to catch any atmospheric formaldehyde on a collector substrate for subsequent analysis on the ground. *[Two monitors each are usually attached side by side, preferably in an orientation with their faces perpendicular to the direction of air flow.]*

Working off his discretionary "as time permits" task list, FE-1 Kononenko gathered and prepared the Fialka-MV-KOSMOS science hardware, including starting recharging the SONY DCR TRV-900E camcorder battery, for tomorrow's GFI-1 recording of images and spectra of the ATV "Jules Verne" reentry. *[The experiment uses the onboard "Relaksatsiya" ("relaxation") equipment with its Fialka-MV-Kosmos multispectral hardware (spectrometer, video camera plus Laptop 3 software) to observe the plasma glow and its spectra created by the ATV on its high-speed interaction with the Earth atmosphere.]*

At ~10:15am EDT, Greg Chamitoff had his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

The crew completed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS (Treadmill with Vibration Isolation & Stabilization) with vibration isolation (CDR/2.5h, FE-1/2.5h, FE-2), and RED resistive exercise device (FE-2).

Before starting his exercise session, Gregory set up the video equipment for filming his subsequent workout on the treadmill for biomechanical evaluation of his performance and assessment of the hardware status by ground engineers. Afterwards, the camera gear was torn down and stowed. *[This was part of Greg's 60-90 day requirement. Sergey & Oleg have already completed their requirements*.]

A second item on the discretionary task list for Oleg was another run of the Russian DZZ-2 "Diatomeya" ocean observations program, using the NIKON-F5 DCS still camera and the HDV (high-definition) video camcorder from SM window 8 for ~20 min to record high production water areas for obtaining data on color field composition in dynamic regions of the ocean and in near-estuary areas of large rivers, plus the current cloud cover above these waters, its rating, and special forms of cloud formation (this was the last day for using film in the NIKON, to be replaced by digital photography in future sessions). *[Target zones today in the Atlantic Ocean were the Magellan Strait to the coastal area of Angola as well as the coastal zone of Brazil and Mauritania, in the Pacific Ocean the area west of New Zealand to the upwelling area of Peru.]*

Also off the Russian suggestions list, Kononenko performed a session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program, using the D2X to take telephotos. *[Uplinked target zones were the glaciers of the Southern Andes and the Laganaki Plateau, the site of future Olympic Games.]*

As generally every day now, today starting at 9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) is activated intermittently for two half-cycles to control ppCO_2 levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

Conjunction Update: Latest tracking data for Object 87055, a piece of debris from the Kosmos-2421 satellite, indicate that its pass tomorrow at ~5:04am EDT will be of no concern (miss ~42.5 km). MCC-H specialists are continuing to monitor.

Week 24 Scheduled Main Activities:

- Mon. (9/29): NUTRITION; BMP ch.1 regen; VELO maint.; ASU toilet replmnts; Elektron maint.; MFCV valve adjustments; Node-2, A/L, Lab SD/BF maint.; GFI-1/Relax. exp. (ATV1 reentry); air sampling (CMS, GSC, AK-1M); IP-1 inspect.; KPT/BAR-RM power charge.
- Tue, (9/30): MO-7; BMP ch.2 regen; TEPC relocate; NOA1 exp.; RED inspect.; IWIS reprog.; Node-1 RFCA Flowmeter test, ITCS MTL (MFCV) adjust, A/L MTL Flowmeter meas.; FMK stow; Kazbek fit checks; crew dep. preps.

No CEO (Crew Earth Observations) photo targets uplinked for today.

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Mean altitude loss in the last 48 hours -- 80 m

Revolutions since FGB/Zarya launch (Nov. 98) -- 56477

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/29/08 -- ATV de-orbit (nighttime re-entry for observation from 2 NASA aircraft; ~9:12pm)
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02/12/09 -- Progress M-67/32P docking
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03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at

http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/27/08
Date:	Saturday, September 27, 2008 2:35:28 PM
Attachments:	image001.gif

ISS On-Orbit Status 09/27/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – light duty day for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff. Congratulations to Taikonaut Zhai Zhigang for spending ~20 minutes outside the Shenzhou-7 spacecraft on the first Chinese spacewalk today (see picture below)!*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the SM (Service Module) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

Afterwards, Volkov temporarily powered down the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem for the periodic cleaning of its pre-filter, using the vacuum cleaner with narrow-slit nozzle attachment.

At ~10:00am EDT the crewmembers conducted their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-Houston and TsUP-Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

FE-2 Chamitoff conducted Part 1 of his Flight Day 120 session (his fifth) with the NASA/JSC experiment NUTRITION w/Repository, for blood collection only, for which he had to forego exercising and food intake since yesterday for eight hours. Later today, the FE-2 will set up the equipment for the 24-hour urine collections which start with the first void early tomorrow morning. Volkov & Kononenko assisted. *[After the CDR performed the phlebotomy, i.e., drawing Greg's blood samples (from an arm vein), with the FE-1 taking photographs, the samples were first allowed to coagulate in the Repository for 20-30 minutes, then spun in the HRF RC (Human Research Facility/Refrigerated Centrifuge) and finally placed in MELFI (Minus-Eighty Laboratory Freezer for ISS). No*

thruster activity was allowed during the blood drawing. The RC was later powered off after a temperature reset to limit wear on the compressor, and cleaned. The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by supercold MELFI dewars), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]

Oleg Kononenko conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Gregory Chamitoff's chosen VolSci (Voluntary Weekend Science) program today involved a 3.5-hour run with the payload SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellites), for which Greg set up the work area in the Lab and two PD-100 camcorders for video capture, dimmed the GLAs (General Luminaire Assemblies) and used the SSC (Station Support Computer) laptop to control the test satellites. *[The SPHERES experiment is a test bed for the development and testing of formation flying and other multi-spacecraft control algorithms. Today's session (Session 13) concentrated on three satellites and five beacons on mounts, with three CO_2 (Carbon Dioxide) tanks and six battery packs, to experiment with docking, formation flight, and reconfigurations. In addition, the session added a wide range of control algorithms for maneuvers previously demonstrated using basic control laws. Modern robust control techniques are combined with path planning and formation flight algorithms to improve the performance of the system. The session also continued to obtain data for control reconfiguration after satellites dock (and their mass properties change). Per applicable Flight Rule, SPHERES operations have no CO_2 output constraints if the CDRA (CO_2 Removal Assembly) is operating in dual-bed or single-bed mode.]*

Later tonight, Chamitoff will disconnect and stow the Ethernet cabling of the A31p PCS-2 (Portable Computer System 2) laptop of the HRF-2 (Human Research Facility 2), used for ANITA (Analyzing Interferometer for Ambient Air), in preparation of the upcoming relocation of the rack from the US Lab to COL (Columbus Orbital Laboratory).

At ~10:55am EDT, Sergey & Oleg downlinked a PAO TV address of greetings to the participants of the Third Science Festival in Moscow, to be held October 10-12 at M. V. Lomonosov Moscow State University, with participation of the Moscow City Government and support of the Federal Agency for Science & Innovations under the Russian

Federation's Ministry of Education & Science. Goals of the festival are to demonstrate the latest scientific achievements and advancement of science research into manufacturing, to draw talented youth into institutions of higher learning, to promote a profession of teacher and scientist. *["…We are sending our heartfelt greetings to the participants of Science Festival in Moscow from onboard of the International Space Station. We are thousands of miles apart now, but we are with you in our thoughts, in Moscow State University, where the Festival's opening ceremony is under way. Most likely this is a very colorful, interesting, and informative event, just like the entire festival's program. This is a remarkable idea to conduct a real celebration of science with participation not just scientists but everybody who is interested in scientific quest and has a thirst for knowledge….Yes, the future of our home very much depends on the extent to which science, engineering and technology are developed, and the degree the world relies on scientific research and knowledge. Moscow Science Festival just serves this noble goal. We are being heard in the MSU Grand Conference Hall, where science festival guests are gathered. Among them there are those whose inspirational work opened a road into space. Our best wishes to you on this day celebrating science and intellect."]*

The two cosmonauts also had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Oleg at ~6:50am, Sergey at ~8:20am.

The crew completed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill with vibration isolation (CDR/2.5h, FE-1/2.5h), and RED resistive exercise device (FE-2).

Later, Oleg transferred the exercise data files to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

As generally every day now, today starting at 9:00am and running until 3:00pm (during the SPHERES session), the US CDRA (Carbon Dioxide Removal Assembly) is activated intermittently for two half-cycles to control ppCO_2 levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

Conjunction Advisory: Another piece of debris from the Kosmos-2421 satellite (Object 87055) will pass by ISS on 9/29 (Monday) at 5:04am EDT. Latest trajectory predictions indicate a miss distance of 30.4 km. MCC-H specialists are closely monitoring. If DAM (Debris Avoidance Maneuver) is required, it could replace the ISS reboost scheduled for 10/2.

Week 23/24 Scheduled Main Activities:

- Sun. (9/28): NUTRITION w/urine collect; TVIS video; FMK deploy; SOLO diet mntr.; GFI-1 charge; PFC (FE-2).
- Mon. (9/29): NUTRITION; BMP ch.1 regen; VELO maint.; ASU toilet replmnts; Elektron maint.; MFCV valve adjustments; Node-2, A/L, Lab SD/BF maint.; GFI-1/ Relax. exp. (ATV1); air sampling (CMS, GSC, AK-1M); IP-1 inspect.; KPT/BAR-RM power charge.
- Tue, (9/30): MO-7; BMP ch.2 regen; TEPC relocate; NOA1 exp.; RED inspect.; IWIS reprog.; Node-1 RFCA Flowmeter test, ITCS MTL (MFCV) adjust, A/L MTL Flowmeter meas.; FMK stow; Kazbek fit checks; crew dep. preps.

Weekly Science Update *(Expedition Seventeen -- Week 23)*

3-D SPACE: In progress.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Measurements continue in FGB module.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3/4 (Binary Colloidal Alloy Test 3/4): BCAT team coordinating pictures with sample modules, ascertaining image quality and comparing Kodak and Nikon camera results. Data download delayed by hurricane Ike. Looking forward to BCAT-4 data.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-2/CGBA-5 (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus 5): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): Due to safety concerns identified for the PLEGPAY instrument (when operated in Plasma Discharge mode), the entire EuTEF platform was put in survival mode on 9/1 at around 11:00am EDT (just prior to 29P undocking). Since then, the EuTEF power feeder#1 has been de-activated and no science acquisition is possible. Request has been approved for intermittent activation for 3 of the 9 EUTEF payloads. EuTEF platform power feeder#1 has been re-activated for 4-hrs periods on 9/20, 9/22, 9/24 and will continue to be re-activated every other day until safety issues are solved with the PLEGPAY instrument. This mitigates the science loss for the EXPOSE, DOSTEL and MEDET instruments only. -- DEBIE-2: Inactive; -- DOSTEL: Inactive, part of proposed intermittent activation;-- EuTEMP: Inactive as planned; -- EVC: Inactive; -- EXPOSE: Inactive, part of proposed intermittent activation; -- FIPEX: Inactive; -- MEDET: Inactive, part of proposed intermittent activation; -- PLEGPAY: Inactive; -- TRIBOLAB: Inactive.

FSL (Fluid Science Laboratory): FSL is nominal.

GEOFLOW: The GEOFLOW EC (Experiment Container) has been removed on 9/16 in view of the 30P docking.

HDTV System Test DL (JAXA): In progress.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): “Greg, thanks for choosing LOCAD on Saturday. You did a great job again and got some interesting results. The LOCAD test you performed was for 'beta-glucan', a molecule found in fungal cell walls. As you know, each test provides 5 sets of data on the display: sample concentration, sample coefficient of variation (CV) %, spike concentration, spike CV%, and recovery %. We're mainly interested in the first number: 'sample concentration' (from 1ng/ml to 100ng/ml). We expected readings around 1ng/ml in Node 1 (a relatively 'clean' location), but you have obtained readings up to 18ng/ml! This was exciting for us because, while not a concern for crew health, it would be a significant event during exploration missions where a major scientific challenge will be to search for

extraterrestrial life AND differentiate it from microbial life associated with the spacecraft and crew. Your work is providing valuable data to help prepare for that challenge."

Marangoni Experiment for ISS (JAXA Fluid Physics Experiment Facility): The fourth run started on 9/25. Part of the differed third run will be conducted in the Inc 17 and some part also in Inc 18.

Micro-G Clay (JAXA EPO): Complete.

MISSE (Materials ISS Experiment): Ongoing.

Moon Photography from ISS (JAXA EPO): Complete.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 "Pirs".

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-1/-2 (Nitric Oxide Analyzer, ESA): Next NOA-1 session currently planned on 9/30.

NUTRITION w/REPOSITORY: In progress.

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PCRF (Protein Crystallization Research Facility) Reconfiguration (JAXA): Complete.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): In progress.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): In progress.

SOLAR (Solar Monitoring Observatory): The next sun visibility window expected to open as of 9/26. -- SOVIM: awaiting the Sun to acquire science; -- SOLSPEC: awaiting the Sun to acquire science; -- SOLACES: awaiting the Sun to acquire science.

SOLO (Sodium Loading in Microgravity): PCBA (Portable Clinical Blood Analyzer) pouches with control solution and cartridges have been transferred to MELFI and all SOLO kits have been transferred from Progress to the ETC (European Transport

Carrier) in COL on 9/18. First SOLO session currently planned to start on 10/3. *[Note: The ETC carries payload items that cannot be launched within the ESA facilities because of stowage or transport limitations. In orbit it serves as a workbench and stowage facility to support experiments with Biolab, the Fluid Science Lab, the European Physiology Modules and the European Drawer Rack.]*

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): Reserve.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): Teams on ground continue to assess the results of the BIOLAB Rotor A Bellow Test, which gave faulty signals for 4 out of 6 Reference ECs. Rotor B Actuator test and Rotor B bellow test have been successfully performed on 9/5.

CEO (Crew Earth Observations): Through 9/15 the ground has received a total of 7,434 frames of CEO images for review and cataloging. "Photos with times corresponding to our CEO target list request times are reviewed first and since our last report included: Pilcomayo River Dynamics, N. Argentina (unconfirmed and under review); Araguainha Impact Crater, Brazil (unconfirmed and under review); Jarvis Island, Equatorial Pacific (acquisition confirmed and under review); Lake Poopo, Bolivia (acquisition confirmed and under review); and Red River Basin (acquisition confirmed and under review). We also wish to acknowledge several of your timely Hurricane Ike images that were used by PAO and the new media. Other imagery of interest noted and under review include: Iceberg A43a, South Atlantic Ocean; Bovet Island, South Atlantic Ocean; sessions with views of Auroras; and views of cities at night, all acquired without our prompting. Your recent striking shot of the Tifernine Dune Field in eastern Algeria will be published on NASA/GSFC's Earth Observatory website this weekend. It nicely illustrates the impact of climate change on the evolution and character of topographic features in this region. Please keep up your good work as we continue to work through our backlog of your imagery due to the JSC closure for Ike."

CEO (Crew Earth Observations) photo targets uplinked for today were **S. Mozambique** *(ISS had a fair-weather pass near midday with the center of this target area just right of track. Researchers requested overlapping long lens views mapping the area along the ground track. The region is undergoing rapid development, and baseline imagery of land cover will be useful to track changes to regional ecosystems over time),* **South Tibesti Megafans** *(these subtle, ancient erosional features in the Sahara are located between Lake Chad to the south and closer to the southern flank of the rugged Tibesti Mountains to the north. Requested were short lens oblique views of the region for later*

use to help pinpoint areas of more detailed shots. ISS approach was from the SW in midday sun and fair weather. After crossing Lake Chad, Greg was to begin shooting broad mapping views of the area to the left of track until he reached the mountains), **B. P. Structure** *(this tiny impact site in eastern Libya near the border with Egypt is just 2 km in diameter and few crews have managed to spot it. On nadir pass in clear weather and early afternoon CEO researchers requested a short lens mapping strip along the track since they plan to use a suitable context view from one of the views to aid in locating it for a long lens shot in the future),* **Pilcomayo River, N Argentina** *(ISS pass over this target area was nadir and at midday with fair weather expected at this time. This failing river system serves as the international boundary between Argentina and Paraguay as it tracks SE-ward from the central Andes Mountains towards the large Parana River. This river has special geological interest because it is blocking its own course with sediment, and spilling out onto the surrounding flatlands, at the point near where the track crosses the course. Also, this river has built the largest megafan [inland delta] on Earth. Greg was to attempt to map the river in detail from where it breaks out of the mountains until it becomes indistinct [Note: The Pilcomayo River should not be confused with the more distinct, neighboring Bermejo River further south which follows a similar course southeastward]),* and **Sevilleta Wildlife Area, New Mexico** *(this wildlife area is also designated as a Long Term Ecological Research [LTER] site. It is primarily situated near either side of the Rio Grande River in central New Mexico. As ISS approached from the SW in late afternoon sun, it may have been partly cloudy, but Greg was to try for detailed views S-to-N along the east side of the river as far north as Santa Fe).*

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 5:11am EDT [= epoch]):
Mean altitude -- 352.4 km
Apogee height -- 356.9 km
Perigee height -- 348.0 km
Period -- 91.59 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006617
Solar Beta Angle -- 21.1 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 68 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56461

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/29/08 -- ATV de-orbit (nighttime re-entry for observation from 2 NASA aircraft; ~9:12pm)
10/01/08 -- **NASA 50 Years** (official)
10/02/08 -- ISS Reboost (~1.8 m/s)

10/14/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4) 12:33am
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/24/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) & landing
11/02/08 -- Progress 30P reboost
11/16/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC (~7:02pm EST)
11/18/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.)
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
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Taikonaut Zhai Zhigang outside Shenzhou-7

航天员成功出舱

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/26/08
Date:	Friday, September 26, 2008 2:30:45 PM
Attachments:	

ISS On-Orbit Status 09/26/08

All ISS systems continue to function nominally, except those noted previously or below.

After configuring the PFE-OUM (Periodic Fitness Evaluation - Oxygen Uptake Measurement) equipment at the HRF-2 (Human Research Facility 2) rack, Gregory Chamitoff conducted his second PFE-OUM session on the CEVIS cycle ergometer while wearing an HRM (Heart Rate Monitor), with Sergey Volkov as operator to obtain measurements of the subject. (First session: 8/21). *[The equipment includes the HRF PFM/PAM (Pulmonary Function Module/Photoacoustic Analyzer Module), Mixing Bag System and GDS (Gas Delivery System). Today's session used GDS tanks 1, 2 & 5. After calibration of the DPFM (Differential Pressure Flowmeter), Gregory, assisted by Sergey, worked through the protocol, changing the loads on the ergometer and recording data. Later, the FE-2 updated the evaluation protocol, deactivated & stowed the gear, and powered down the PFE-OUM laptop. Purpose of PFE-OUM is to measure aerobic capacity during exercise within 14 days after arrival on ISS, and once monthly during routine PFEs. The data allows exercise physiologists & flight doctors to assess the crew's health & fitness and to provide data for modifying & updating crew-specific exercise regimes. By hooking up a special cable, continuous oxygen uptake measurements can now be taken while riding the CEVIS without requiring access to the CEVIS control panel as before. PFE-OUM is a collaborative effort between NASA and ESA (European Space Agency).]*

FE-1 Kononenko underwent his first session of the biomedical MBI-5/KARDIO-ODNT protocol, an extensive cardiovascular test of human pericardium (heart muscle) activity as well as of primary parameters of central and regional blood circulation at rest and under the effect of lower body negative pressure (LBNP, Russian: ODNT). The test was controlled from TsUP-Moscow by a biomed specialist via VHF over RGS (Russian ground site) comm window (~9:08am EDT). CDR Volkov, who had his session yesterday, assisted as CMO (Crew Medical Officer). *[The LBNP, generated by a specially designed "Chibis" suit (PVK),*

applies suction on the lower body ranging from 10 to 60 mm Hg, thereby exerting a functional loading roughly equivalent to 10-60 kg of force on the musculoskeletal system to test the body's adaptation to prolonged exposure to microgravity. After an initial setup period, during which Sergey attached a large number of electrodes to Oleg's head, body and extremities, cardiographic readings on the oscilloscope of the Gamma-1M medical complex were taken during two RGS comm passes, first without, then with the Chibis suit.]

In preparation for another run with the US SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment, FE-2 Chamitoff first changed the batteries in three Actiwatches & the Actiwatch Reader, then downloaded SLEEP data from his Actiwatch to the HRF-1 (Human Research Facility 1) laptop for subsequent downlink and verification by the support scientist. Afterwards, he re-initialized all three Actiwatches. *[To monitor his sleep/wake patterns and light exposure, Chamitoff wears the special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout this run. The log entries are done within 15 minutes of final awakening for seven consecutive days. The other two Actiwatches were initialized for Soyuz 17S CDR Yuri Lonchakov and SFP (Space Flight Participant) Richard Garriott.]*

After recharging the SONY camcorder battery, Oleg Kononenko installed the geophysical GFI-1 Relaksatsiya ("relaxation") experiment at Service Module (SM) window #1 from six GFI-1 hardware kits, reconfigured the Payload Laptop 3 for the experiment and installed the spectrometer (SP) lens accessory on the camcorder. *[Purpose of the science experiment, which ran from 1:45pm to 2:10pm, was to contribute to a hyperspectral space/time study of radiation patterns from the Earth ionosphere and Earth limb. Afterwards the equipment was stowed again. Relaksatsiya normally deals with the study of the chemoluminescent chemical reactions and atmospheric light phenomena (emissions, i.e., molecular relaxation processes), including those that occur during high-velocity interaction between the exhaust products from space vehicles and the atmosphere at orbital altitude and during the entry of space vehicles into the Earth's upper atmosphere. For the Russian Relaxation experiment, ISS attitude was changed at 1:25pm for 20 min, with control authority handed over to Russian thrusters at 1:20pm, to be returned to US Momentum Management at ~3:08pm. Before the maneuvers, Chamitoff closed the protective Lab science window shutters; the Kibo laboratory window was already shuttered from earlier.]*

Before sleeptime tonight, the FE-2 will set up NASA's NUTRITION w/Repository experiment hardware for his fifth session, starting tomorrow with the standard blood draw (phlebotomy), for which Greg has to start fasting 8 hrs before, i.e., tonight, with only water consumption allowed. *[The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes*

during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by supercold MELFI dewars), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]

Continuing the current round of periodic preventive maintenance of RS (Russian Segment) ventilation systems, Kononenko used a vacuum cleaner and soft brush to clean the detachable VT7 fan screens 1, 2, and 3 of the three SOTR gas-liquid heat exchangers (GZhT4) in the FGB (Funktsionalnyi-Grusovoi Blok). The CDR later did his share by cleaning the VD1 & VD2 air ducts in the "Pirs" DC-1 (Docking Compartment).

In preparation for upcoming adjustment work on four MFCVs (Manual Flow Control Valves) in the Lab, required for the installation of the Regenerative ECLSS racks arriving on ULF2, Gregory set up and tested the hardline power supply for the Non-intrusive Flowmeter, required for the valve adjustments and an ITCS MTL (Internal Thermal Control Systems/Moderate Temperature Loop) accuracy check. *[These activities were originally scheduled in May this year, prior to 1J, but had to be aborted due to issues with the Flowmeter batteries. As a work-around, Greg will use the Shuttle Breakout Box to connect the Flowmeter to hardline power. The MFCV flow adjustments are scheduled on 9/29 & 9/30, along with time for removing stowage from the translation paths of racks that may need to be rotated for access, and an activity to configure the Flowmeter settings.]*

The FE-1 completed another radiation data checkup for accumulated flux & dose rate data with the Matryoshka-R radiation payload (RBO-3-2) and its LULIN-5 electronics box.

CDR Volkov meanwhile worked in the SM on the “Sputnik” amateur radio station, removing the old Kenwood radio and replacing it with a new Kenwood VHF transceiver. After connecting it and its IBM ThinkPad web camera to the RSK2 laptop and power, Sergey configured the ham radio’s settings and conducted a health check.

The FE-2 turned off PCS (Portable Computer System) laptops not being used at the moment, and conducted the regular bi-monthly reboots of the OCA Router and File Server SSC (Station Support Computer) laptops.

The FE-1 completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance*

consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]

Oleg also handled the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

In the Kibo JPM (JEM Pressurized Module), Gregory supported Tsukuba flight controllers by verifying a ground-commanded checkout of the CB (Clean Bench) subrack facility (except its microscope). *[Ground commanding of JPM payloads is done by JAXA’s SSIPC (Space Station Integration & Promotion Center) at Tsukuba/ Japan. The CB, a subrack of the Saibo (“living cell”) Rack, provides a germ-free environment for life science and biotechnological experiments. It has a specially designed microscope that operates with bright-field, phase-contrast and fluorescence modes.]*

Chamitoff filled out the regular FFQ (Food Frequency Questionnaire), his 13th, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

The crew completed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2/PFE-OUM), TVIS treadmill with vibration isolation (CDR/2.5h, FE-1/2.5h), and RED resistive exercise device (FE-2).

Later, Oleg transferred the exercise data files to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

As generally every day now, today starting at ~5:30am and running until 11:30am, the US CDRA (Carbon Dioxide Removal Assembly) is activated intermittently for two half-cycles to control ppCO_2 levels. This configuration for the daily ops does

not require connecting & disconnecting the ITCS cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

At ~4:10am EDT, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU/*Glavnaya operativnaya gruppa upravleniya* = *"Chief Operative Control Group"*), including Shift Flight Director (SRP), at TsUP-Moscow via S-band/audio, phone-patched from Houston and Moscow.

At ~3:10pm, the ISS crew is scheduled for their regular weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC]*.

WRM Update: An updated WRM (Water Recovery Management) "cue card" was uplinked overnight for the crew's reference, updated with yesterday's water audit. *[The new card (17-1016A) lists 29 CWCs (~1047.5 L total) for the four types of water identified on board: technical water (326.2 L, for flushing only because of* Wautersia *bacteria), potable water (647.8 L, incl. 194.8 L currently on hold), condensate water (56.5 L), waste/EMU dump and other (17 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

Week 23/24 Scheduled Main Activities:

- Fri. (9/26): CB (Clean Bench) funct. checkout; PFE-OUM exam; VT-7 heat exch. fan grille cleaning, MBI-5/KARDIO-ODNT/LBNP; GFI-1; ham equipmt R&R; FS & OCA router reboot; FFQ; NUTRITION prep.
- Sat. (9/27): NUTRITION w/blood collect; station cleaning; POTOK maint.; PFCs (CDR, FE-1); prep for HRF-2 rack transfer (PC2 laptop decable).
- Sun. (9/28): NUTRITION w/urine collect; TVIS video; FMK deploy; SOLO diet mntr.; GFI-1 charge; PFC (FE-2).
- Mon. (9/29): NUTRITION; BMP ch.1 regen; VELO maint.; ASU toilet replmnts; Elektron maint.; MFCV valve adjustments; Node-2, A/L, Lab SD/BF maint.; GFI-1/Relax. exp. (ATV1); air sampling (CMS, GSC, AK-1M); IP-1 inspect.; KPT/BAR-RM power charge.
- Tue, (9/30): MO-7; BMP ch.2 regen; TEPC relocate; NOA1 exp.; RED inspect.; IWIS reprog.; Node-1 RFCA Flowmeter test, ITCS MTL (MFCV) adjust, A/L MTL Flowmeter meas.; FMK stow; Kazbek fit checks; crew dep. preps.

CEO (Crew Earth Observations) photo targets uplinked for today were **Mt. Kilimanjaro, Kenya** *(Kilimanjaro is the highest peak in Africa at 5,895 meters. The highest point on Kilimanjaro is Uhuru Peak, located on the volcano Kibo. The top of*

Kibo is a 1.5 mile wide crater. Of interest to researchers is the documentation of the ice cap. Originally predicted in 2002 to be gone some time between 2015 and 2020 by paleoclimatologist Lonnie Thompson, new studies indicate the ice will remain until 2040. Other studies suggest that the retreat of the ice cap is due to decreased precipitation rather than rising temperatures), and **Lake Poopo, Bolivia** *(Lake Poopo is a large saline lake located in a shallow depression in Bolivia at about 3,700 meters. This is a very shallow lake with a mean depth of no more than 3 meters. The surface area of the lake, however, varies greatly indicating the seasonal precipitation levels. Documenting the lake color and extent).*

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 6:19am EDT [= epoch]):
Mean altitude -- 352.5 km
Apogee height -- 357.0 km
Perigee height -- 348.0 km
Period -- 91.59 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006717
Solar Beta Angle -- 25.7 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 57 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56446

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/29/08 -- ATV de-orbit (nighttime re-entry for observation from 2 NASA aircraft; ~9:12pm)
10/01/08 -- **NASA 50 Years** (official)
10/02/08 -- ISS Reboost (~1.8 m/s)
10/14/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4) 12:33am
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/24/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) & landing
11/02/08 -- Progress 30P reboost
11/16/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC (~7:02pm EST)
11/18/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch

11/30/08 -- Progress M-66/31P docking
12/01/08 -- STS-126/Endeavour/ULF2 landing (~1:25pm EST est.)
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/25/08
Date:	Thursday, September 25, 2008 1:33:54 PM
Attachments:	

ISS On-Orbit Status 09/25/08

All ISS systems continue to function nominally, except those noted previously or below.

Upon wake-up, CDR Volkov terminated his 11th SONOKARD experiment session for the long-term MBI-12 Russian sleep study, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

Continuing communications outfitting activities in the SM (Service Module), begun earlier, CDR Volkov installed new cabling connecting the BSK-1B and BSK-2B Common Power Switching Timers behind panel 436 to the ASN Satellite Navigation System. *[BSK-2B was temporarily taken out to for installing the connections and a subsequent checkout of the activated ASN and SM Printer1, before these systems were powered off again and the BSK-2B re-installed.]*

Later, the Elektron electrolysis machine, turned off for the duration of BITS2-12 onboard measurement telemetry system powerdown, was reactivated at 32 amps, supported by Kononenko monitoring the external temperature of its secondary purification unit (BD) for the first 10 minutes of operations to ensure that there was no overheating. *[The gas analyzer used on the Elektron during nominal operations for detecting hydrogen (H_2) in the O_2 line (which could cause overheating) is not included in the control algorithm until 10 minutes after Elektron startup.]*

As has become standard operating procedure after deactivation/reactivation of VD-SU monitoring mode, Oleg also performed a quick function verification of the SUBA Ethernet connection between the OpsLAN (Operations Local Area Network) and the BRI Smart Switch Router in the SM.

FE-2 Chamitoff unstowed and set up the PFE-OUM (Periodic Fitness Exam-Oxygen Uptake Measurement) equipment on the HRF-2 (Human Research Facility 2) rack, including the PFM/PAM (Pulmonary Function Module/Photoacoustic Analyzer Module), Mixing Bag System and GDS (Gas Delivery System), for his second PFE-OUM protocol session tomorrow, with Volkov serving as operator. *[The PFE-OUM experiment, using the CEVIS ergometer for workout, demonstrates the capability of crewmembers to perform periodic fitness evaluations with continuous oxygen consumption measurements within 14 days after arrival on ISS, and once monthly during routine PFEs. Once the capability of the pulmonary function system (PFS) to perform PFEs is verified, crewmembers will be able to integrate their monthly PFE with oxygen consumption measurements to fulfill the requirement for cardiovascular fitness evaluations during long-duration space flight.]*

Volkov underwent his first session of the biomedical protocol KARDIO-ODNT (MBI-5), an extensive cardiovascular test of human pericardium (heart muscle) activity as well as of primary parameters of central and regional blood circulation at rest and under the effect of lower body negative pressure (LBNP, Russian: ODNT). The test was controlled from TsUP-Moscow by a biomed specialist via VHF over RGS (Russian ground site) comm window (~10:16am EDT). FE-1 Kononenko assisted as CMO (Crew Medical Officer). *[The LBNP, generated by a specially designed "Chibis" suit (PVK), applies suction on the lower body ranging from 10 to 60 mm Hg, thereby exerting a functional loading roughly equivalent to 10-60 kg of force on the musculoskeletal system to test the body's adaptation to prolonged exposure to microgravity. After an initial setup period, during which Oleg attached a large number of electrodes to Sergey's head, body and extremities, cardiographic readings on the oscilloscope of the Gamma-1M medical complex were taken during two RGS comm passes, first without, then with the Chibis suit.]*

The CDR had two hours set aside to work in the DC1 (Docking Compartment), removing the SU-95 matching unit of the RS (Russian Segment) STTS onboard radio communications system and replacing it with a new spare.

In preparation for brief Progress thruster firings at ~11:35am EDT, Chamitoff closed the protective shutters of the science window in the JAXA JPM and in the U.S. Lab. *[The thruster firings were in support of the R7 software upload to the primary & backup GNC (Guidance, Navigation & Control) MDMs at ~11:30am. For the transitioning of the backup GNC to primary, ISS attitude control authority was handed over to the RS MCS (Motion Control System) at 11:30am, to be returned to*

US Momentum Management at ~2:10pm after the GNC MDM transition. The Lab window can be re-opened two orbits later, at ~5:10pm. The Kibo window remains closed at least until after the Relaxation Experiment tomorrow (9/26, ~1:45pm).]

Chamitoff's participation in the ongoing X2R7 software transition today focused on

(1) Powering on the CUP PCS (Cupola Portable Computer System) and A/L (Airlock) PCS A31p laptops, each equipped with vers. R11 hard disks, following the ground-controlled transition of the C&C (Command & Control) MDMs to CCS R7, and

(2) Replacing the remaining old R10 hard drives of the SM, COL, JEM and Lab RWS PCS laptops with the deployed new R11 drives, powering each PCS laptop up after the swap and finally stowing the old R10s.

[Reconfiguration of the new primary and backup C&C MDMs was performed by MCC-H. The ground also loaded the Node-1 MDMs (with NCS R3) and the GNC MDMs (with GNC R7).]

Sergey Volkov performed monthly maintenance on the deactivated Russian IK0501 GA (Gas Analyzer) of the SOGS Pressure Control & Atmospheric Monitoring System by replacing its CO_2 filter assembly (BF) with a new unit from FGB stowage (done last: 8/14), then reactivating the unit. The old filter was discarded.

FE-1 Kononenko updated the Russian laptops RSS1, RSS2, RSE1, RSK1 and RSK2 with the latest virus definition database for their Norton AntiVirus application, then scanned the laptops, saving the scan protocols for downlink to TsUP-Moscow via OCA for analysis.

Oleg also collected the periodic ISS cabin air readings with the Russian GANK-4M Real-Time Harmful Contaminant Gas Analyzer system. *[AOK GANK-4M tests for Methane (CH_4), Ammonia (NH_3), Carbon Monoxide (CO), Formaldehyde (HCHO), Nitrogen Oxides (NO, NO_2), Hydrogen Chloride (HCl), Hydrogen Fluoride (HF), and Hydrogen Cyanide (HCN).]*

To support IPU (Image Processing Unit) activation in the JAXA JPM (JEM Pressurized Module) by the ground, Gregory Chamitoff turned on the MMA (Microgravity Measurement Apparatus) and its laptop (MLT), by first powering up the MMA's NCU/RSU (Network Control Unit/Remote Sensor Unit) set from the Ryutai rack's UDC (Utility DC to DC Converter), then turning on both the NCU/RSU and MLT. *[Kibo Lab systems were powered down by SSIPC (Space Station Integration & Promotion Center) in Tsukuba from 8:30am-10:00am in support of the GNC X2R7 software transition.]*

In the COL (Columbus Orbital Laboratory), Gregory was to search for a stowage

bag with 5 pairs of K-BAR (Knee-Brace Assembly Replacement) capture mechanisms (CMs), required for the upcoming relocation of the two HRF (Human Research Facility) racks to Columbus, set for 10/1 & 10/2, and their correct installation at the F4 & A4 locations. The K-BAR CMs were to be installed right away. *[If the bag is not found, two pairs of CMs from NASA stock were to be used for now, to avoid delaying the rack relocation.]*

Chamitoff and Kononenko each had about 1.5 hrs reserved for deploying new Emercy-2/Warning SODF (Station Operations Data File) procedure documents reflecting the X2R7 software upgrade.

The CDR completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Sergey also handled the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Gregory retrieved the LOCAD-PTS (Lab-On-a-Chip Application Portable Test System) media slides of his last VolSci (Voluntary Weekend Science) session from incubation, recorded the temperature reading from the incubation bag and the colony count for each slide, photographed the slides and then discarded them as wet trash. *[LOCAD technology has an ever-expanding range of applications in the biotech industry. Chips are available (or in development) which can also detect yeast, mold, and gram positive bacteria, identify environmental contaminants, and perform quick health diagnostics in medical clinics. The technology has been used to swab the MERs (Mars Exploration Rovers) for planetary protection. With expanded testing on ISS, began by Sunita Williams in March/April of last year, this compact technology has broad potential applications in space exploration--from monitoring environmental conditions to monitoring crew health. The current study should prepare for long-duration exploration by demonstrating a system that enables the crew to perform biochemical analysis in space without having to return samples to Earth.]*

The FE-2 completed the weekly 10-min. CWC (Contingency Water Container) inventory as part of on-going WRM (Water Recovery & Management) assessment of onboard water supplies. Updated “cue cards” based on the crew’s water calldowns are sent up every other week. *[The new card (17-1016) lists 29*

CWCs (~1047.4 L total) for the four types of water identified on board: technical water (326.2 L, for flushing only because of Wautersia *bacteria), potable water (669.8 L, incl. 174.6 L currently on hold), condensate water (34.4 L), waste/EMU dump and other (17 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

Gregory also conducted another one of the periodic offloadings of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (#1054) with the collected water slated for processing. Samples were not required.

Chamitoff performed periodic maintenance on the CEVIS (Cycle Ergometer with Vibration Isolation & Stabilization), changing out its isolators with new 6-inch units from a stowage kit.

The crew completed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill with vibration isolation (CDR, FE-1/2.5h), and RED resistive exercise device (FE-2).

Later, Oleg transferred the exercise data files to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

As generally every day now, today starting at ~4:00am and running until 10:00am, the US CDRA (Carbon Dioxide Removal Assembly) is activated intermittently for two half-cycles to control $ppCO_2$ levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

At ~7:30am, Gregory powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, & power supply) and conducted, at 7:35am, a ham radio exchange with the Michael Sobell Sinai School in Harrow, Middlesex, UK. *[The Michael Sobell Sinai School opened in 1981 and is the largest Jewish Primary School in Europe. It caters for children aged 3-11 and offers a challenging curriculum and the highest standard of education. Two of its pupils, Jessica and Amelia Diamond, visited KSC in May to see their cousin, FE-2 Greg Chamitoff, launch on the Shuttle to the ISS. Questions were uplinked beforehand. "What training do you do to become an astronaut?", "What is the purpose of your trip?"; "How do you go to the toilet?"; "Will there ever be a day*

when we can holiday on the moon?"; "Could you describe what the earth looks like when you are in space and can you identify continents, weather conditions and the seas?"; "If one of your children wanted to be an astronaut, what would you say to them?"]

Week 23/24 Scheduled Main Activities:

- Fri. (9/26): CB (Clean Bench) funct. checkout; PFE-OUM exam; VT-7 heat exch. fan grille cleaning, MBI-5/KARDIO-ODNT/LBNP; GFI-1; ham equipmt R&R; FS & OCA router reboot; FFQ; NUTRITION prep.
- Sat. (9/27): NUTRITION w/blood collect; station cleaning; POTOK maint.; PFCs (CDR, FE-1); prep for HRF-2 rack transfer (PC2 laptop decable).
- Sun. (9/28): NUTRITION w/urine collect; TVIS video; FMK deploy; SOLO diet mntr.; GFI-1 charge; PFC (FE-2).
- Mon. (9/29): NUTRITION; BMP ch.1 regen; VELO maint.; ASU toilet replmnts; Elektron maint.; MFCV valve adjustments; Node-2, A/L, Lab SD/BF maint.; GFI-1/Relax. exp. (ATV1); air sampling (CMS, GSC, AK-1M); IP-1 inspect.; KPT/BAR-RM power charge.

CEO (Crew Earth Observations) photo target uplinked for today was S. Mozambique (Greg had a nadir pass over this site; overlapping mapping frames taken along track were requested. The region is undergoing rapid development, and imagery of the existing state of land cover will be useful to track changes to regional ecosystems over time).

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 7:27am EDT [= epoch]):
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Solar Beta Angle -- 30.2 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 57 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56431

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/29/08 -- ATV de-orbit (nighttime re-entry for observation from 2 NASA aircraft;

~9:12pm)
10/01/08 -- **NASA 50 Years** (official)
10/02/08 -- ISS Reboost (~1.8 m/s)
10/14/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4) 12:33am
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10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/24/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) & landing
11/02/08 -- Progress 30P reboost
11/16/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC (~7:02pm EST)
11/18/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
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02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
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05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/24/08
Date:	Wednesday, September 24, 2008 1:21:05 PM
Attachments:	

ISS On-Orbit Status 09/24/08

All ISS systems continue to function nominally, except those noted previously or below.

Upon wakeup, FE-1 Kononenko terminated his eleventh SONOKARD experiment session for the long-term Russian sleep study MBI-12, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. Sergey Volkov's new MBI-12 session starts tonight (~5:20pm). *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

CDR Volkov worked several hours on the Russian BITS2-12 onboard telemetry measurement system, performing maintenance by removing its PTsB central processor subsystem (Monoblock TA968MA) and replacing it with a new TA968MA unit delivered on Progress 30P. *[Deactivating the BITS2-12 and VD-SU monitoring mode also required the Elektron oxygen generator to be turned off during the outfitting activities.]*

Later, the Elektron electrolysis machine was activated again at 32 amps, supported by Kononenko monitoring the external temperature of its secondary purification unit (BD) for the first 10 minutes of operations to ensure that there was no overheating. *[The gas analyzer used on the Elektron during nominal operations for detecting hydrogen (H_2) in the O_2 line (which could cause overheating) is not included in the control algorithm until 10 minutes after Elektron startup.]*

As has become standard operating procedure after deactivation/reactivation of VD-

SU monitoring mode, Oleg also performed a quick function verification of the SUBA Ethernet connection between the OpsLAN (Operations Local Area Network) and the BRI Smart Switch Router in the SM.

The FE-1 performed the periodic hardware structure & surface sampling for microbial contamination in the RS (Russian Segment), using a sampling kit for taking swabs from designated panel locations in the SM (Service Module) and FGB. The sample tubes were then prepared for return on Soyuz TMA-12 next month.

For FE-2 Chamitoff and the USOS (US Segment), today began the long-awaited X2FR7 software transition during which MCC-Houston is remotely upgrading several MDM (Multiplexer/Demultiplexer) computers to new software versions, from today to 9/26 (Friday). For Chamitoff, today's activities consisted of installing new 60GB hard drives with R11 software into the Airlock & CUPOLA PCS (Portable Computer System) A31p ThinkPad laptops which he had previous image-ghosted. The old CPS R10 hard drives were stowed away. *[MCC-H will transition the C&C (Command & Control) MDM to CCS R7 software, the GNC (Guidance, Navigation & Control) MDM to GNC R7, and the Node-1 MDMs to NCS R3 software. More upgrade steps are scheduled tomorrow and Friday.]*

Gregory also had 3.5 hrs for unpacking and stowing US cargo delivered on Progress 30P, with special attention to his food for the upcoming SOLO (Sodium Loading in Microgravity) experiment. Completed items were reported to MCC-H for IMS (Inventory Management System) logging.

After emptying 30P's potable water tanks BV1 & BV2 yesterday, Sergey Volkov today began the usual transfer of liquid waste (urine) from 2-3 EDV-U containers to the cargo ship's BV1 Rodnik tank, using jumpers and the electric pump. [*More transfers from an accumulated total of currently 5 EDV-Us will be performed in the next several days as part of SOZh maintenance.]*

Oleg Kononenko worked on the plant growth experiment BIO-5 Rasteniya-2 ("Plants-2"), first copying accumulated CR10X data files to a memory card for return to Earth, then collecting samples of grown Mizuna plants, taking documentary photography, placing the samples in a Ziploc bag and stowing the package in the MELFI (Minus Eighty Degree Laboratory Freezer for the ISS), in Dewar 3, Tray B. *[Mizuna (Brassica rapa nipposinica) is a tasty variety of Japanese mustard greens, also known as California Peppergrass, eaten as a salad.]*

In the Node-1, Chamitoff performed maintenance on the RED (Resistive Exercise Device) workout machine, adjusting the spiral pulleys of both canisters (to increase their load for the user) and installing an external spline (which he had found) on the

fore canister. Afterwards Greg concluded the job with the standard Flexpac canister load calibration, as required after cable replacements/adjustments. *[Chamitoff's on-orbit calibration of the Schwinn RED cans re-established the relationship of specific load settings with a specific number of pulls per setting, followed by recording of the load values measured with a calibration tool and steel handles from the on-orbit calibration kit.]*

On the Russian Matryoshka-R (RBO-3-2) radiation payload in the DC1 (Docking Compartment), Oleg checked out the ALC-952 memory card and activated the AST Spectrometer for data takes. *[After retrieving a used PCMCIA (Portable Computer Memory Card International Adapter) card, ALC-952, from stowage, Oleg activated the AST twice to verify the card's labels and orientation, then re-inserted ALC-952 in the spectrometer and activated the AST again after its powerdown yesterday.]*

The FE-1 also conducted the periodic checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the passageways SM PrK (Transfer Compartment) – RO (SM Working Compartment), PkhO (SM Transfer Tunnel) – RO, PkhO – DC1, PkhO – FGB PGO, FGB PGO – FGB GA, and FGB GA–Node-1, but not for the hatch to Soyuz.

Afterwards, Kononenko took the periodic readings of potentially harmful atmospheric contaminants in the SM, using the CMS (Countermeasure System), a component of the SKDS GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, today using preprogrammed microchips to measure for Isopropanol ("rubbing alcohol", C_3H_8O), Methanol ("wood alcohol", CH_3OH) and Toluene (methylbenzene, C_7H_8).

Continuing the current round of periodic preventive maintenance of RS ventilation systems, the FE-1 spent an hour in the FGB (*Funktsionalnyi-Grusovoi Blok*), cleaning the detachable fan screens 1, 2, and 3 of the three SOTR gas-liquid heat exchangers (GZhT4) and the fixed grill of GZhT #4.

As a new item on the Russian discretionary "time permitting" task list, the CDR completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Oleg meanwhile handled the daily IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/ import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew completed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill with vibration isolation (CDR/2.5h, FE-1/2.5h), and RED resistive exercise device (FE-2).

Later, Sergey transferred the exercise data files to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) is activated intermittently for two half-cycles to control $ppCO_2$ levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

At ~2:00pm EDT, Gregory is scheduled for his regular weekly PMC (Private Medical Conferences) via S- & Ku-band audio/video, deferred from yesterday.

Week 23 Scheduled Main Activities:

- Thu. (9/25): SODF deploy; PCS R11 reload; MDM X2R7 software upgrade; BSK-2B timer R&R; CO_2 BF filter R&R; CEVIS R&R; WRM/CWC audit; MBI-5/KARDIO-ODNT/LBNP; SONOKARD.
- Fri. (9/26): CB (Clean Bench) funct. checkout; PFE-OUM exam; VT-7 heat exch. fan grille cleaning, MBI-5/KARDIO-ODNT/LBNP; GFI-1; ham equipment R&R; FS & OCA router reboot; FFQ; NUTRITION prep.
- Sat. (9/27): NUTRITION w/blood collect; station cleaning; POTOK mtn; PFCs (CDR, FE-1); prep for HRF-2 rack transfer (PC2 laptop decable).
- Sun. (9/28): NUTRITION w/urine collect; TVIS video; FMK deploy; SOLO diet mon; GFI-1 charge; PFC (FE-2).

CEO (Crew Earth Observations) photo targets uplinked for today were **Typhoon Hagupit, Pacific Ocean** *(Dynamic Event. Looking to the right of track for Typhoon Hagupit, predicted to be a Category 1 storm at the time of ISS overpass. The storm was beginning to interact with land along the northern Gulf of Tonkin, and the center should have been over the island of Hainan,* **Antarctic Ice Pack, S. Atlantic Ocean** *(shooting to the right of track as ISS approached Antarctica for ice rafts; a gap in the cloud cover is predicted for this portion of the South Atlantic Ocean. Photographs of sea ice are requested as part of IPY [International Polar Year]*

activities), and **Tenoumer Impact Crater, Mauritania** *(Greg had a nadir pass over this young, small [2 km diameter] impact structure. While a well-defined circular crater is present, its small size will make it a challenging target. Overlapping mapping nadir-viewing frames, taken along track, were recommended in order to obtain imagery of the crater).*

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 7:01am EDT [= epoch]):
Mean altitude -- 352.6 km
Apogee height -- 357.2 km
Perigee height -- 348.0 km
Period -- 91.59 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006805
Solar Beta Angle -- 34.5 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 54 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56415

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/29/08 -- ATV de-orbit (nighttime re-entry for observation from 2 NASA aircraft; ~9:12pm)
10/01/08 -- **NASA 50 Years** (official)
10/02/08 -- ISS Reboost (~1.8 m/s)
10/10/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4) 12:33am
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/24/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) & landing
11/12/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/14/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking

02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/23/08
Date:	Tuesday, September 23, 2008 12:59:28 PM
Attachments:	

ISS On-Orbit Status 09/23/08

All ISS systems continue to function nominally, except those noted previously or below. *>>>>Today at ~8:10am EDT, the ISS (specifically its FGB module) completed* ***56,400 orbits*** *of the Earth, having covered a distance of 2.362 billion kilometers (1.476 billion st.miles) in 3595 days. The 19,300 kg (42,600 lbs) Zarya ("Dawn") was launched on a Russian/ Khrunichev Proton from Baikonur almost ten years ago (11/20/98) as the first element of the multi-national space station.<<<<*

CDR Volkov serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out"-to-vacuum cycle on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~4:15pm EDT. Filter bed #1 was regenerated yesterday. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time: 9/16 & 9/17).]*

Volkov prepared, set up and activated the DAKON-M hardware for the new Russian experiment TEKh-15/"IZGIB" ("bend", "curve"), conducting equipment calibration and taking camcorder imagery of the activity, before tearing the gear down and putting it back in stowage. The video footage was downlinked at ~8:00am EDT. *[For the purpose of updating mathematical models of the ISS gravitation environment, IZGIB uses accelerometers of the Russian SBI Onboard Measurement System, the GIVUS high-accuracy angular rate vector gyrometer of the SUDN Motion Control & Navigation System and other accelerometers for unattended measurement of micro-accelerations at science hardware accommodation locations - (1) in operation of onboard equipment having rotating parts (gyrodynes, fans), (2) when establishing and keeping various ISS attitude modes, and (3) when performing crew egresses into space and physical exercises.]*

The CDR & FE-1 completed the two-hour Part 2 of their second onboard "Profilaktika" (MBI-8, "Countermeasures") series of preventive health maintenance fitness testing on the treadmill, assisting each other in turn. *[Today's fitness test was performed on the TVIS in unmotorized (idle) mode, with free choice of speeds within the range permitted. The test investigates the action mechanism and efficiency of various countermeasures (currently VELO and TVIS) aimed at preventing locomotor system disorders in weightlessness. The test differs from the normal TVIS session by the use of the TEEM-100 gas analyzer (via a mask equipped with a pneumotachometer sensor), measurement of blood lactate level and subjective evaluation of physical exertion levels during the test. The lactate blood samples were taken twice at the end of the session, using the ACCUSPORT analyzer and REFLOTRON-4 accessories. Results were entered on a log sheet. TEEM and ECG (electrocardiograph) data were transferred to the RSE-Med laptop, also on a tape cassette (Cardiocassette-2000), and prepared for later downlink via Regul-Packet comm.]*

FE-2 Chamitoff deployed five new 30P-delivered SODF ATU (Station Operations Data File/Audio Terminal Unit) procedures cue cards in the Airlock (A/L), in the Lab (at the aft ATU), in Node-2 (at the port ATU), in the JPM (JEM Pressurized Module) near the JEM RMS (Robotic Manipulator System) workstation, and in the COL (Columbus Orbital Laboratory) at the portside aft ATU.

Afterwards, Gregory completed another run with the MedOps experiment WinSCAT (Spaceflight Cognitive Assessment Tool for Windows), his fourth onboard session, by logging in on the MEC (Medical Equipment Computer) and performing the psychological evaluation exercise on the laptop-based WinSCAT application. *[WinSCAT is a monthly time-constrained questionnaire test of cognitive abilities, routinely performed by astronauts aboard the ISS every 30 days before or after the PHS (periodic health status) test or on special CDR's, crewmembers or flight surgeons request. The test uses cognitive subtests that measure sustained concentration, verbal working memory, attention, short-term memory, spatial processing, and math skills. The five cognitive subtests are Coding Memory - Learning, Continuous Processing Task (CPT), Match to Sample, Mathematics, and Coding Delayed Recall. These WinSCAT subtests are the same as those used during NASA's long-duration bed rest studies.]*

After recharging the battery for the SONY DVCAM-150 video camcorder, the CDR set it up alongside the Fialka UVC (Ultraviolet Video Camera) for an equipment test of the geophysical GFI-1 Relaksatsiya ("relaxation") experiment, with which to record images and radiation patterns of the ATV (Automated Transfer Vehicle) "Jules Verne" during its reentry next week (9/29, ~9:12pm EDT). Afterwards, the equipment was deactivated and disassembled. *[Relaksatsiya normally deals with the study of the chemoluminescent chemical reactions and atmospheric light*

phenomena (emissions, i.e., molecular relaxation processes), including those that occur during high-velocity interaction between the exhaust products from space vehicles and the atmosphere at orbital altitude and during the entry of space vehicles into the Earth's upper atmosphere. "Relaxation", in Physics, is the transition of an atom or molecule from a higher energy level to a lower one, emitting radiative energy in the process as equilibrium is achieved.]

The FE-2 took down and stowed the UOP DCP (Utility Outlet Panel/Display & Control Panel) bypass power cable to the VTR (Video Tape Recorder) at the Lab CUP RWS (Cupola Robotics Work Station), set up for the recent SSRMS (Space Station Remote Manipulator System) activities (9/8).

Chamitoff & Volkov conducted the major task, deferred earlier, of relocating the CHeCS (Crew Health Care Systems) Rack in the Lab from the D4 position to the LAB S4 position, which required them to –

- Clear stowage items from the D4 rack front and from the S4 empty rack bay;
- Clear a 50in x 72in. translation passage of protruding items, needed for the rack transfer,
- Relocate the CHeCS Rack from position D4 to S4,
- Reroute cables as required and mate CHeCS umbilicals, and
- Restow any items temporarily relocated before the transfer to their original locations.

[The remaining rack transfers have been rescheduled as follows:

- *HRF-2 from Lab P1 to COL SA4 (10/1),*
- *HRF-1 from Lab S2 to COL F4 (10/2),*
- *MELFI from Lab O4 to JPM D4 (10/3),*
- *a ZSR (Zero-G Stowage Rack) from Lab O5 to JPM F6 (10/7),*
- *a second ZSR from Node-2 D5 to JLP A2 (10/7), and*
- *an RSR (Resupply Stowage Rack) from Node-2 P5 to Lab O5 (10/7).]*

With the CHeCS Rack transferred, Chamitoff worked on completing the outfitting of the future Regenerative ECLSS with the Modification Kit #1, started earlier (8/28).

On the Russian Matryoshka-R (RBO-3-2) radiation payload in the DC-1 Docking Compartment, Oleg deactivated the AST Spectrometer, removed its ALC-951 PCMCIA (Portable Computer Memory Card International Adapter) and checked out its contents on the RSK-1 laptop before stowing it in its kit. AST remains off.

Sergey Volkov did additional work on the two new Zveno-B ("Link-B") modems plus, installed last month for the TVS LIV television system, by installing two VM electronic filters and their connection and grounding cables behind SM (Service Module) panel 437.

Oleg Kononenko meanwhile set up hoses, adapters and electric pump for transferring the potable water supplies from Progress M-65's BV1 & BV2 Rodnik water tanks into EDV containers in the SM. Later, the pumping equipment was dismantled and the activities were closed out. *[After hooking up the plumbing, the water was transferred at first to the EDVs in self-flow (under its own tank pressure), then using the compressor pump via a GZhS gas/liquid separator to remove air bubbles in the water. The tank bladders were then compressed. The subsequent filling of the empty Progress tanks with urine will be scheduled later. Each of the two Progress tanks carries 53 liters of water, which amounts to two full EDVs, leaving 9 liter for filling into a fifth EDV. One of the full EDVs was then installed in the SVO-ZV Water Supply System, replacing an empty EDV (#4).]*

Starting a new round of periodic preventive maintenance of ventilation systems in the RS (Russian Segment), the FE-1 had almost 3 hrs reserved for cleaning fan screens in the SM.

At ~1:35pm EDT, MCC-H uplinked and installed a new payload software patch to the Lab RWS PCS (Portable Computer System), and later today Greg Chamitoff will configure the A31p after its ground-commanded reboot. *[Uploaded files were R10011PYLDP4.pch & R10011PYLDP4.cmd.]*

In the SM, Oleg completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Sergey took care of the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew had their regular weekly PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Sergey at ~12:05pm, Oleg at ~1:30pm, Greg at ~1:45pm EDT.

At ~5:20pm, just before sleep time, the FE-1 will again set up the Russian MBI-12 SONOKARD (Sonocard) payload and start his eleventh experiment session, using a sports shirt from the SONOKARD kit with a special device in the pocket for testing a new method for acquiring physiological data without using direct contact on the skin. Measurements are recorded on a data card for return to Earth.
[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3)

study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]

At ~11:10am, TsUP-Moscow ran a test of String 3 of the Regul-OS, without requiring crew attendance. *[Regul-OS is the Russian radio control and communications system (RSUS), equivalent to the U.S. S-band system. It is the nominal uplink path for all Russian commanding, and it handles two-way voice comm, digital/command/program data, as well as telemetry via RGS (Russian ground sites).]*

The crew completed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill with vibration isolation (CDR/MBI-8, FE-1/MBI-8), CEVIS cycle ergometer (FE-2), and RED resistive exercise device (FE-2).

Later, Sergey transferred the exercise data files to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) is activated intermittently for two half-cycles to control $ppCO_2$ levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

Conjunction: Another piece of debris from the Kosmos-2421 satellite (Object 33134) will pass by ISS tomorrow morning at 6:03am EDT. Latest trajectory predictions indicate a miss distance of 19.13 km (Pc = 6.3×10^{-15}). No avoidance action is required.

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

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Solar Beta Angle -- 38.6 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 89 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56400

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
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10/01/08 -- **NASA 50 Years** (official)
10/02/08 – ISS Reboost (~1.8 m/s)
10/10/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4) 12:33am
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
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11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
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02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola

02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/22/08
Date:	Monday, September 22, 2008 11:17:54 AM
Attachments:	

ISS On-Orbit Status 09/22/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 23 of Increment 17.*

CDR Volkov performed the periodic maintenance of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The process will be terminated at ~4:30pm EDT and Bed #2 regeneration performed tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently (last time: 9/16 & 9/17).]*

Sergey Volkov and Oleg Kononenko again had several hours set aside for Progress 30P unloading, transferring and stowing Russian & US cargo aboard the station, while tracking moves & locations in the IMS (Inventory Management System) database with BCRs (Bar Code Readers).

The CDR and FE-1 both completed the first part of the onboard "Profilaktika" (MBI-8, "Countermeasures") preventive health maintenance fitness test on the VELO bicycle ergometer, assisting each other in turn. Part 2, on the TVIS treadmill, is scheduled tomorrow. *[Test procedure for MBI-8, which requires workouts on the VELO and TVIS, is identical to the Russian MO-5 assessment, but in addition to the nominal procedure it uses the TEEM-100M gas analyzer with breathing mask, a blood lactate test with the ACCUSPORT analyzer and REFLOTRON-4 accessories, and a subjective evaluation of physical exertion levels during the test (using the Borg Perceived Exertion Scale, viz., 10 steps from very light over hard and very hard to maximum). Results are entered on a log sheet. TEEM and ECG (electrocardiograph) data are transferred to the RSE-Med laptop, also on a tape cassette (Cardiocassette-2000), and prepared for later downlink via Regul-Packet comm. Results are also called down to specialists standing by at TsUP.]*

Sergey Volkov spent some time familiarizing himself with the DAKON-M hardware and procedures for the new Russian TEKh-15 experiment “IZGIB” (“bend”, “curve”), scheduled tomorrow. *[IZGIB uses accelerometers of the Russian SBI Onboard Measurement System, the GIVUS high-accuracy attitude sensors of the SUDN Motion Control & Navigation System and the LKT local temperature sensor in the Progress 30P vehicle for unattended study of the relationships between onboard systems operating modes and ISS flight conditions.]*

FE-2 Chamitoff conducted the periodic inspection of the SPS ELPS (Secondary Power System/Emergency Lighting & Power Supply) subsystems in the Lab (2 units), Node-2 (2 units), A/L (US Airlock, 1 unit), and Node-1 (3 units).

In the U.S. “Quest” A/L, FE-2 Chamitoff installed EMU (Extravehicular Maneuvering Unit) spacesuit #3003 for the standard suit maintenance process, including dumping water from and refilling the feedwater tank. Afterwards, the scrubbing was terminated, the EMU water processing kit disassembled and the equipment stowed. *[After removing EMU #3018 from the aft EDDA (EMU Don Doff Assembly) and installing #3003 instead, Greg connected it to its SCUs (Service & Cooling Umbilicals) and initiated the standard 1hr scrubbing process on the spacesuit’s cooling water loops, filtering ionic and particulate matter (via a 3-micron filter). Afterwards, the FE-2 reconfigured the cooling loops and initiated the ~2hr biocide filtering. Loop scrubbing, incl. iodination of the LCVGs (Liquid Cooling & Ventilation Garments) for biocidal maintenance, is done to eliminate any biomass and particulate matter that may have accumulated in the loops].*

The FE-1 took and downloaded the periodic sensor readings of the Russian “Pille-MKS” (MKS = ISS) radiation dosimetry experiment which has ten sensors placed at various locations in the Russian segment (DC1, SM starboard & port cabin windows, ASU toilet facility, control panel, etc.). *[Nine of the ten dosimeters are read manually.]*

The CDR initiated another recharge cycle on the batteries for the SONY HVR-Z1J digital high-definition camcorder used for onboard video tapings.

In the SM, Oleg completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Sergey took care of the daily IMS maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Gregory restored the AAL (Alternate Applications Laptop) in the US Lab to its previous SSC (Station Support Computer) configuration by replacing the AAL HDD (Hard Disk Drive) with the original SSC drive and stowing the AAL drive. *[The AAL was prepared on 9/9 from a previously-loaded SSC for use on the OpsLAN network with applications requiring older software & driver versions, specifically to run the DCS760 digital cameras needed for the BCAT-3/4 (Binary Colloidal Alloy Test) science experiment.]*

The FE-2 also spent several hours supporting JAXA's SSIPC (Space Station Integration & Promotion Center) in checking out the CB (Clean Bench) subrack's Microscope unit. Afterwards, Greg deactivated CB ventilation. *[CB checkout, without Microscope, was started last month. Ground commanding of JPM (JEM Pressurized Module) payloads, including checkout and temperature control, is done remotely by the SSIPC at Tsukuba/Japan. The CB provides a germ-free environment for life science and biotechnological experiments. It has a specially designed microscope that operates with bright-field, phase-contrast and fluorescence modes. The objective lens can be switched between four magnification levels (4x, 10x, 20x, 40x).]*

Working off the Russian at-crew's-discretion task list, Kononenko conducted the regular status check of the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (barley) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

The crew completed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), RED resistive exercise device (FE-2), and VELO bike with bungee cord load trainer (CDR/MBI-8, FE-1/MBI-8).

Later, Sergey transferred the exercise data files to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~3:10pm EDT, the crew will convene for their standard bi-weekly teleconference with the JSC Astronaut Office (Steve Lindsey), via S-band S/G-2 audio & phone patch.

As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) is activated intermittently for two half-

cycles to control $ppCO_2$ levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 9/1/08, this database contained 770,668 views of the Earth from space, with 324,812 from the ISS alone).

ISS Orbit (as of this morning, 7:44am EDT [= epoch]):
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Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007075
Solar Beta Angle -- 42.4 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 48 hours -- 48 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56384

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
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02/10/09 -- Progress M-67/32P launch

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02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/21/08
Date:	Sunday, September 21, 2008 11:36:01 AM
Attachments:	

ISS On-Orbit Status 09/21/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – off-duty day for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff. Last day of Summer! Ahead: Week 23 of Increment 17.*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the SM (Service Module) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

As part of the house cleaning, Volkov and Kononenko conducted regular maintenance inspection & cleaning on fan screens in the FGB (TsV2), DC-1 (V3) and SM (VPkhO, VPrK, FS5, FS6 & FS9).

Kononenko completed the routine daily servicing of the SOZh system (ECLSS/ Environment Control & Life Support System) in the SM, including the periodic checkup on the Russian POTOK-150MK(150 micron) air filter unit of the SOGS air revitalization subsystem, gathering weekly data on total operating time & “On” durations for reporting to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

At ~10:15am EDT the crewmembers conducted their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-Houston and TsUP-Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

Working off the discretionary “time permitting” task list, CDR Volkov ran another session for Russia's Environmental Safety Agency (EKON), making observations and taking KPT-3 aerial photography with the NIKON D2X camera of environmental conditions in Russia.

Also for Sergey, the voluntary job list called for another run of the Russian DZZ-2 "Diatomeya" ocean observations program, using the NIKON-F5 DCS still camera with f85mm lens and the HDV camcorder from SM window #7 to record color field patterns in target water areas and current atmospheric conditions above them. *[Uplinked target zones in the Atlantic Ocean were the coastal area from the Argentine Bay Baja Grande to the Guinea cost, and in the Indian Ocean the area from the south of South Africa to the Bay of Bengal.]*

The FE-1 meanwhile had two suggested tasks on the “available time” list: the regular status check of the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (barley) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}), and the periodic documentary close-up photography of the two SKK materials exposure payloads mounted on the outside of the station,- SKK-2 on the “Pirs” Docking Compartment (DC-1) from SM window #6, and SKK-9 on the SM hull, from the DC-1 EVA hatch window.

A third voluntary task for Kononenko was another run of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program, using the D2X digital camera with the F800 telephoto lens. *[Uplinked target areas were Andean glaciers in South America.]*

The crew completed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-2), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

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04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/20/08
Date:	Saturday, September 20, 2008 2:19:50 PM
Attachments:	

ISS On-Orbit Status 09/20/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – light duty day for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff.*

Post-Hurricane Ike Update: JSC/MCC-H operations have been handed back to Houston. JSC will open officially for business on 9/22 (Monday). Overnight uplink from BCC (Backup Control Center) at MSFC/Huntsville to the ISS crew: *"By the time you read this, we should be well on our way back to Houston. Our stay in Huntsville has been amazing; the folks at the Huntsville Operations Support Center really know how to host a visiting Flight Control Team!"*

CDR Volkov and FE-1 Kononenko again had several hours set aside for Progress unloading, transferring and stowing Russian & US cargo aboard the station, while tracking moves & locations in the IMS (Inventory Management System) database with BCRs (Bar Code Readers).

Volkov also performed the routine task of taking two photos of the internal part of the SM (Service Module) aft port's SSVP-StM docking cone, used for the 30P linkup on 9/17 and earlier for the docking of ATV1 "Jules Verne". These images are used to refine current understanding of docking conditions. The pictures were then transferred to OCA for subsequent downlinking. *[The objective is to take photo imagery of the scratch or scuff mark left by the head of the active docking probe on the internal surface of the passive drogue (docking cone) ring, now rotated out of the passageway. As other crewmembers before him, the CDR used the Nikon D1X digital still camera to take two pictures each with the hatch closed down.]*

Kononenko initiated another recharge cycle on the batteries for the SONY HVR-Z1J digital high-definition camcorder used for onboard video tapings.

For his Voluntary Weekend Science (VolSci) program today, FE-2 Chamitoff conducted his second session with the LOCAD-PTS (Lab-on-a-Chip Application

Development-Portable Test System) payload, first connecting (later disconnecting) the Reader unit to a UOP (Utility Outlet Panel), then sampling/swabbing surface sites in Node-1 for yeast & molds, using Glucan LAL cartridges and a Negative Control sample of clean water. *[LOCAD uses small, thumb-sized "microfluidic" cartridges that are read by the experiment reader. The cartridges contain dried extract of horseshoe crab blood cells (LAL/Limulus amebocyte lysate) and colorless dye. LAL tests are used for the detection and quantification of bacterial endotoxins: in the presence of the bacteria, the dried extract reacts strongly to turn the dye a green color. Therefore, the more green dye, the more microorganisms there are in the original sample. Glucans are complex carbohydrate (sugar, D-glucose) macromolecules. The handheld device tests this new analysis technology by sampling for the presence of gram negative bacteria in the sample in about 15 minutes, showing the results on a display screen. Background: Lab-on-a-Chip technology has an ever-expanding range of applications in the biotech industry. Chips are available (or in development) which can also detect yeast, mold, and gram positive bacteria, identify environmental contaminants, and perform quick health diagnostics in medical clinics. The technology has been used to swab the MERs (Mars Exploration Rovers) for planetary protection. With expanded testing on ISS, began by Sunita Williams in March/April last year, this compact technology has broad potential applications in space exploration--from monitoring environmental conditions to monitoring crew health. The current study should prepare for long-duration exploration by demonstrating a system that enables the crew to perform biochemical analysis in space without having to return samples to Earth.]*

Oleg Kononenko unloaded new RODF (Russian Operations Data File) material from Progress 30P and replaced/updated respective procedures sheets in seven RODF books (Technical Experiments, Medical Experiments, Long-Duration Missions, SM IFM IVA, DC-1 IFM IVA, FGB IFM IVA, Progress M-65 Transfer Ops) plus the BIO4 DVD disk.

A new item added to Greg Chamitoff's discretionary "job jar" task list is to look for and locate a number of GRAs (Glove Ring Assemblies) for the MSG (Microgravity Science Glovebox). *[13 older GRAs are to return to Earth on ULF-2, while 13 GRAs of newer design are to remain onboard for the ULF-2 stage.]*

In the SM, the CDR completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS), today as a discretionary job from the "time permitting" task list. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The FE-1 performed the daily IMS maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

WRM Update: An updated WRM (Water Recovery Management) “cue card” was uplinked overnight for the crew’s reference, updated with the latest water audit. *[The new card (17-1016) lists 29 CWCs (~1047.4 L total) for the four types of water identified on board: technical water (326.2 L, for flushing only because of* Wautersia *bacteria), potable water (669.8 L, incl. 174.6 L currently on hold), condensate water (34.4 L), waste/EMU dump and other (17 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

The crew completed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

Later, Oleg transferred the exercise data files to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~11:15am EDT, the crew downlinked a PAO TV address of greetings to the participants of the International Conference "Life Support Systems as Means of Human Exploration of Deep Space", to take place in Moscow next week (9/24-27), *dedicated to the 45th Anniversary of the State Scientific Center of Russian Federation –IMBP (Institute of Medical and Biological Problems) of the Russian Academy of Science, and it is carried out under the aegis of the Russian Academy of Science, Russian Space Agency, Federal Medical and Biological Agency of Russia, IMBP, RSC-Energia and Khrunichev State Space Scientific and Industrial Center. [“…As it goes in a song – “The environment at home is topmost…». The ISS is currently our home, our street, our stadium, our work. It is the functioning of the life support system (SOZh) that our well-being, our mood and finally the successful implementation of the mission program depend on. The life support systems that combine the physico-chemical and biological processes of the cycle of matter become even more crucial in course of interplanetary expeditions. We are confident that the research results provided in presentations of the eminent scientists and experts in the field of the life support systems development as well as discussions concerning various directions of these systems creation will serve as a powerful incentive for the development of new perspective means to support long-lasting human life and work in deep space. We wish you successful work.”]*

Weekly Science Update *(Expedition Seventeen -- Week 22)*

3-D SPACE: In progress.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Measurements continue in FGB module.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-2/CGBA-5 (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus 5): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): Due to safety concerns identified for the PLEGPAY instrument (when operated in Plasma Discharge mode), the entire EuTEF platform was put in survival mode on 9/1 at around 11:00am EDT (just prior to 29P undocking). Since then, the EuTEF power feeder#1 has been de-activated and no science acquisition is possible. Request has been approved for intermittent activation for 3 of the 9 EUTEF payloads (EXPOSE, MEDET, DOSTEL) while working on ensuring permanent re-activation as soon as possible.

FSL (Fluid Science Laboratory): FSL is nominal.

GEOFLOW: The GEOFLOW EC (Experiment Container) has been removed on 9/16 in view of the 30P docking.

HDTV System Test DL (JAXA): In progress.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Planned.

Marangoni Experiment for ISS (JAXA Fluid Physics Experiment Facility): Parts of the third run have been deferred to later because of control transfer to the BCC.

Micro-G Clay (JAXA EPO): Complete.

MISSE (Materials ISS Experiment): Ongoing.

Moon Photography from ISS (JAXA EPO): Complete.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-1/-2 (Nitric Oxide Analyzer, ESA): Next NOA-1 session currently planned on 9/30.

NUTRITION w/REPOSITORY: In progress.

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PCRF (Protein Crystallization Research Facility) Reconfiguration (JAXA): Complete.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): In progress.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): In progress.

SOLAR (Solar Monitoring Observatory): The Sun observation window closed on 9/7. In view of Hurricane Ike and transition to BAT/BCC, SOLAR has been required to go to feeder#2 only. Instruments were therefore switched off on 9/11. Upon 30P docking on 9/17, SOLAR and its instruments were powered back on, awaiting the next sun visibility window expected to open as of 9/26.

SOLO (Sodium Loading in Microgravity): PCBA (Portable Clinical Blood Analyzer) pouches with control solution and cartridges have been transferred to MELFI and all SOLO kits have been transferred from Progress to the ETC (European Transport Carrier) in COL on 9/18. First SOLO session currently planned to start on 10/5. *[Note: The ETC carries payload items that cannot be launched within the ESA facilities because of stowage or transport limitations. In orbit it serves as a workbench and stowage facility to support experiments with Biolab, the Fluid Science Lab, the European Physiology Modules and the European Drawer Rack.]*

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): Reserve.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): Teams on ground continue to assess the results of the BIOLAB Rotor A Bellow Test, which gave faulty signals for 4 out of 6 Reference ECs. Rotor B Actuator test and Rotor B bellow test have been successfully performed on 9/5.

CEO (Crew Earth Observations): Ongoing.

No CEO (Crew Earth Observations) photo targets uplinked for today.

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11/14/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola

02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/19/08
Date:	Friday, September 19, 2008 1:51:12 PM
Attachments:	

ISS On-Orbit Status 09/19/08

All ISS systems continue to function nominally, except those noted previously or below.

Post-Hurricane Ike Update: JSC/MCC-H operations will be handed back to Houston later today after the Progress thruster tests. JSC will open officially for business on 9/22 (Monday).

Working in the newly-arrived Progress M-65 cargo ship (TKG), CDR Volkov installed the LKT local temperature sensor commutator (TA251MB) of the BITS2-12 onboard telemetry measurement system, along with its ROM unit (read-only memory, TA765B), a 1-hr. job. The LKT was subsequently switched on by the ground to complete the basic configuration. *[The standard US-21 matching unit was installed yesterday, connecting the SM (Service Module) with the Progress motion control and DPO thrusters systems, so that they can be commanded by the SM computer system (BVS). The Progress thrusters will be test fired later today to insure their functionality in providing attitude control for ISS. This fully incorporates 30P into the steering logic for the ISS.]*

Volkov and FE-1 Kononenko had again several hours set aside for Progress unloading, transferring and stowing Russian & US cargo aboard the ISS, while tracking moves & locations in the IMS (Inventory Management System) database with BCRs (Bar Code Readers)

Afterwards, Sergey & Oleg undertook their fifth periodic (generally monthly) health test with the cardiological experiment PZEh MO-1 ("Study of the Bioelectric Activity of the Heart at Rest") on the TVIS (Treadmill with Vibration Isolation System). *[During the 50-min. test, the crewmembers tagged up with ground specialists on an RGS (Russian Groundsite) pass at ~12:23pm EDT via VHF and downlinked data from the Gamma-1M ECG (electrocardiograph) for about 5-6 minutes.]*

Working in the JAXA Kibo laboratory, FE-2 Chamitoff continued outfitting activities,

first assembling LDFR (Long Duration Foot Restraints), with plates and loops, and their mounting rails, then installing the LDFRs in the JPM (JEM Pressurized Module). After also unstowing and installing four SDFRs (Short Duration Foot Restraints) in Kibo, Gregory took a series of photographs in JPM and JLP (JEM Logistics Pressurized Section), documenting current stowage configurations.

Afterwards, Chamitoff replaced failed lights (GLAs/General Luminaire Assemblies) in Kibo, specifically in JLP
a failed LHA (Light Housing Assembly, FP2), replacing it with the LHA from lighting fixture PA2, plus a failed BBA (Baseband Assembly), and in JPM a failed LHA (OA2), replacing it with the LHA of OF2, plus a failed BBA (OF2).

Greg also made preparations for packing the dried marble papers that resulted from the JAXA EPO (Education Payload Operation) experiments AQUASPHERE and INK BALL for return to Earth. *[The Japanese EPO program consists of eight activities: Life in the Universe (study of space environment effects on living things for educational purpose); Space Poem Chain (poems by famous poets and general public composed & recorded before the launch on a DVD, played and stored on ISS); Microgravity Clay (sculpting in clay to express the inspiration of human space flight); Aquasphere (recording the motion of a water sphere after external oscillations in micro-G environment with an HDTV camera, making various water shapes by vibration); Ink Ball (creating ink flow patterns/"marbling" on the water sphere, then transferring the marbling from the water ball to handmade Japanese papers for recording); Art (images taken with the HDTV camera on the ISS); Space Clothes (studying new clothing designs in space); and Photographing the Moon (images taken of the Moon from the station).]*

In addition, the FE-2 performed troubleshooting on the JPM PLT (Payload Laptop), an A31p/ThinkPad, by calling up and checking its BIOS Setup Utility. As noticed early last month, the PLT had developed a noisy hard drive (see 8/1/08 status).

In the SM, the CDR completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS), today as a discretionary job from the "time permitting" task list. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The FE-1 performed the daily IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Gregory completed the weekly 10-min. CWC (Contingency Water Container)

inventory as part of on-going WRM (Water Recovery & Management) assessment of onboard water supplies. Updated “cue cards” based on the crew’s water calldowns are sent up every other week. *[The new card (17-0002Z) lists 30 CWCs (~1100.4 L total) for the four types of water identified on board: technical water (342.3 L, for flushing only because of* Wautersia *bacteria), potable water (706.7 L, incl. 174.6 L currently on hold), condensate water (34.4 L), waste/EMU dump and other (17 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

Chamitoff completed another one of the periodic inspections of the RED (Resistive Exercise Device) canister cords and accessories, currently done every two weeks.

The FE-2 also took measurements for the regular atmospheric status check for $ppCO_2$ (Carbon Dioxide partial pressure) in the Lab, SM at panel 449 and COL (Columbus Orbital Laboratory) plus battery ticks, using the hand-held CDMK (CO_2 Monitoring Kit, #1002). The unit was then deactivated and returned to its stowage location (LAB1S2). *[Purpose of the 5-min activity is to trend with MCA (Major Constituents Analyzer), i.e., to correlate the hand-held readings with MCA measurements.]*

Greg conducted the regular 30-day inspection of the new AED (Automated External Defibrillator) in the CHeCS (Crew Health Care Systems) rack. *[The AED is a portable electronic device that automatically diagnoses the potentially life threatening cardiac arrhythmias of ventricular fibrillation and ventricular tachycardia in a patient. It then can treat them through defibrillation, i.e., the application of electrical therapy which stops the arrhythmia, allowing the heart to re-establish an effective rhythm. AEDs are generally either held by trained personnel who will attend events or are public access units which can be found in places including corporate and government offices, shopping centers, airports, restaurants, casinos, hotels, sports stadiums, schools and universities, community centers, fitness centers, health clubs and any other location where people may congregate.]*

The crew completed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR/MO-1, FE-1/MO-1), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

Later, FE-2 transferred the exercise data files to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~4:15am EDT, Sergey & Oleg linked up with TsUP stowage specialists via S-band to conduct the weekly IMS tagup, discussing inventory & stowage issues, equipment locations and cargo transfers.

At ~6:15am, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU/*Glavnaya operativnaya gruppa upravleniya* = *"Chief Operative Control Group"*), including Shift Flight Director (SRP), at TsUP-Moscow via S-band/audio, phone-patched from Houston and Moscow.

Dynamic 30P Thruster Tests: FE-2 Chamitoff closed the protective shutters of the science window in the JAXA JPM (~9:00am EDT) and in the US Lab (~9:15am) in preparation for the Progress thruster firings, which are scheduled at ~2:01pm (Manifold 1) & ~3:32pm (Manifold 2). The translational DPO-B (Approach & Attitude Control) thruster tests, intended to check 30P's full integration into the ISS steering logic and ensure thruster functionality in providing attitude control, reboosts and debris avoidance maneuvers (DAMs), do not require any powerdowns. They are also used to determine which thruster manifold, of two jets each, will be considered the primary one for reboosting and DAMs.

CDRA Update: The US Carbon Dioxide Removal Assembly is working nominally. *[On 9/13, CDRA had a hardware failure caused by the CSV (Channel Selector Valve) and ASV (Air Supply Valve) not completing valve position changes during a half cycle transition. Manual commanding of the valves was attempted twice, without success, whereupon CDRA was shut down and the LTL (Low Temperature Loop) coolant jumper disconnected. On 9/15, the valves were successfully ground-commanded into position and the CDRA was reactivated. It is now operating without further problems. The 9/13 valve event is thought to be a recurrence of intermittent CSV valve positioning problems ("sticking") encountered before, caused by zeolite dust contamination of the valve sealing surfaces. Procedures exist to manually command the valves to their correct positions. It is also possible to clean or replace the valves on orbit. Background: A zeolite is a hydrated aluminosilicate mineral with a micro-porous structure. More than 150 zeolite types have been synthesized and 48 naturally occurring zeolites are known (e.g., volcanic ashes). They are the aluminosilicate members of the family of microporous solids known as "molecular sieves", which refers to a particular property of these materials: the ability to selectively sort molecules based primarily on a size exclusion process.]*

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit (as of this morning, 8:00am EDT [= epoch]):
Mean altitude -- 352.7 km
Apogee height -- 357.3 km
Perigee height -- 348.1 km
Period -- 91.59 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006843
Solar Beta Angle -- 51.0 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 70 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56337

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/29/08 -- ATV de-orbit (nighttime re-entry for observation from 2 NASA planes; 9:12pm)
10/01/08 -- **NASA 50 Years** (official)
10/02/08 – ISS Reboost (~1.8 m/s)
10/10/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4) 12:33am
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/24/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) & landing
11/12/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/14/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch

05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/18/08
Date:	Thursday, September 18, 2008 1:34:50 PM
Attachments:	

ISS On-Orbit Status 09/18/08

All ISS systems continue to function nominally, except those noted previously or below. *Crew wake-up time remained shifted forward by one hour (3:00am); sleeptime tonight is back on regular (5:30pm) as will be tomorrow's schedule.*

Hurricane Ike Recovery Update: JSC/MCC-Houston remains closed but will open on Monday (9/21). BAT/BCC (BCC Advisory Team/Backup Control Center) are maintaining monitoring and commanding through JSC assets. ISS FC (Flight Control) will resume from MCC-H tomorrow during the morning hours (9/19, Friday).

After yesterday's nominal Progress M-65/30P docking (2:43pm EDT), crew activities today dealt mostly with cargo unloading, transferring, unpacking, stowing and IMS (Inventory Management System) logging. *[Using an uplinked transfer list, CDR Volkov & FE-1 Kononenko had about 4.5 hrs reserved for stowing cargo items in the limited free volume zones of the FGB, including 26 KRP containers with Russian food rations (2 for ISS-17, 24 for ISS-18/Fincke, Lonchakov, Wakata), 6 containers and 2 CTBs (Cargo Transfer Bags) with American "bonus" food (Fincke, Lonchakov, Chamitoff). Food rations include "skip cycle" backup stock for the event of missed Progress 31P delivery. Eagerly awaited fresh food packages include tomatoes, apples, grapefruits, onions and garlic.]*

In addition, Volkov & Kononenko applied special priority to the unloading & transfer of time-critical science experiment/payloads to the ISS, specifically –

- TKhN-9 (KRISTALLIZATOR/Crystallizer): for biological macromolecule crystallization and to obtain bio-crystal films under micro-G conditions. *[Transferred to the SM (Service Module) plus activation of crystallization process and documentation with NIKON D2X digital photography by Oleg]*,
- BTKh-1,2,3,4,20 (GLICOPROTEID/Glycoprotein, MIMETIK-K, KAF, VAKTSINA-K/Vaccine, INTERLEUKIN-K): for biotechnological crystal growth and study of various proteins. *[With the "Luch-2 biocrystallizer and the "Kriogem-03M" freezer, stowed in the SM and documented with NIKON*

photography],

- BTKh-29 ZHENSHEN-2 (Ginseng-2), in BIOEKOLOGIYA #10 container, for the study of new plants for biological products and genotypes with increased biological activity. *[Transferred from 30P to the DC1 Docking Compartment & photographed]*, and
- SOLO PCBAs (Sodium Loading in Microgravity/Portable Clinical Blood Analyzers) for upcoming experimentation by Gregory Chamitoff. *[Transferred from 30P to the MELFI (Minus Eighty Degree Laboratory Freezer for the ISS) and stowed in a box module in Dewar 4, with photo documentation.]*

After the unloading, with the Elektron O_2 generator and BITS2-12 onboard measurement telemetry (TM) system turned off by ground commanding, Sergey Volkov worked in the new Progress cargo ship, installing the standard US-21 matching unit, a 1-hr. task, and then hooked up its TM connector to the BITS2-12. *[The US-21 Matching Unit connects the SM with the Progress motion control and DPO thrusters systems, so that they can be commanded by the SM computer system (BVS). The BITS2-12 and its VD-SU control system mode were subsequently turned back on. A dynamic Progress thruster test of the complete integration of 30P into the ISS is scheduled tomorrow (2:01pm-2:04pm & 3:32pm-3:25pm), after installation of the LKT local temperature sensor commutator (TA251MB) of the BITS2-12, along with its ROM unit (read-only memory, TA765B).]*

With BITS2-12 again up and running, TsUP-Moscow will restart the Elektron electrolysis unit at ~2:45pm EDT in 32A mode, while Volkov monitors the external temperature of its secondary purification unit (BD) for the first 10 minutes of operations to ensure that there is no overheating.

Also, as a new regular activity after deactivation/reactivation of the VD-SU control mode, Sergey will be checking the BRI Smart Switch Router computer and its new Ethernet connection to assess any potential impact of these activities on Ethernet comm. *[BRI is part of the RS OpsLAN (Russian Segment/Operations Local Area Network), with connections to the three SSC clients, the Ethernet tie-in with the US network, and a network printer in the RS.]*

FE-2 Chamitoff powered down the IWIS (Internal Wireless Instrumentation System), then downloaded the accumulated structural dynamics data of yesterday's Progress docking from the IWIS RSUs (Remote Sensor Units) in the Lab, Node-1, Node-2, FGB and SM.

Performing corrective outfitting in the JAXA JPM (JEM Pressurized Module), Gregory installed hatch handle guide rings at the overhead & starboard hatches

(EVA side), along with stowage decals for the two.

Also in the Kibo laboratory, the FE-2 connected the rack-to-module umbilicals of the ICS (Interorbit Communications System) Rack, one of the eight racks delivered on STS-123/Endeavour (1J/A) last March. *[Note: The JEMRMS (JEM Robotic Manipulator System) checkout planned for tomorrow was deferred to a later date.]*

In Node-2, Greg also installed a hatch handle guide ring, at its port hatch (EVA side).

In the SM, the CDR completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS), today as a discretionary job from the "time permitting" task list. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The crew completed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

Later, Chamitoff transferred the exercise data files to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

WRM Update: An updated WRM (Water Recovery Management) "cue card" was uplinked overnight for the crew's reference, updated with the latest water audit. *[The new card (17-0002Z) lists 30 CWCs (~1100.4 L total) for the four types of water identified on board: technical water (342.3 L, for flushing only because of* Wautersia *bacteria), potable water (706.7 L, incl. 174.6 L currently on hold), condensate water (34.4 L), waste/EMU dump and other (17 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

Dynamic 30P Thruster Tests: Standard Progress thruster test firings are scheduled tomorrow, in order to check 30P's full integration into the ISS steering logic and ensure thruster functionality in providing attitude control, reboosts and debris avoidance maneuvers (DAMs). No powerdowns required. The DPO (Approach & Attitude Control) thrusters will be fired on Manifold 1 & 2 at 2:01pm EDT & 3:32pm, respectively. *[These dynamic firings test the installation of the electronic US-21 Matching Unit box in the Progress vehicle, performed today, which*

connects its motion control and DPO systems to the SM so that they can be commanded by the latter's BVS computer system. They are also used to determine which thruster manifold will be considered the primary one for reboosting and DAMs.]

TRRJ Anomalies: Three "tooth crashes" (temporarily misaligned gear teeth in weightlessness) occurred associated with TRRJ (Thermal Radiator Rotary Joint) operations during Progress docking; two were recovered by autorecovery and one was recovered manually. In all three cases, autorecovery software did not work as expected.

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit (as of this morning, 7:48am EDT [= epoch]):
Mean altitude -- 352.8 km
Apogee height -- 357.4 km
Perigee height -- 348.2 km
Period -- 91.60 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006802
Solar Beta Angle -- 52.7 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 58 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56321

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/19/08 -- Progress 30P dynamic thruster test
09/29/08 -- ATV de-orbit (nighttime re-entry for observation from 2 NASA planes; 9:12pm)
10/01/08 -- **NASA 50 Years** (official)
10/02/08 – ISS Reboost (~1.8 m/s)
10/10/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4) 12:33am
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
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02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
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10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
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04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/17/08
Date:	Wednesday, September 17, 2008 2:50:11 PM
Attachments:	

ISS On-Orbit Status 09/17/08

All ISS systems continue to function nominally, except those noted previously or below. *Crew sleep cycle: Wake time was shifted forward by one hour (3:00am-6:30pm EDT) to gain additional time tonight for Progress post-dock activities.*

Hurricane Ike Recovery Update: JSC/MCC-H remains closed but will open on Monday (9/21). BAT/BCC (BCC Advisory Team/Backup Control Center) are maintaining monitoring and commanding through JSC assets. Communications with ISS are open from JSC, but on single server/string (no redundancy). Ku-band downlink for video depends on TDRS (Tracking & Data Relay Satellite) availability.

Yest kasaniye! At 2:43pm EDT, Progress M-65 (30P) docked smoothly at the SM (Service Module) aft port, followed by a final DPO post-contact thrusting burn, docking probe retraction and hook closure ("sborka") after motion damp-out, while the ISS was in free drift for ~20 min. At "hooks closed" signal, the SM returned to active attitude control, maneuvering the ISS to LVLH TEA (local vertical/local horizontal Torque Equilibrium Attitude). Control authority will return to US Momentum Management at ~4:25pm. All Progress systems operated nominally from Automated Rendezvous start at ~2:12pm. The crew was provided with all necessary instructions for taking over USOS (US Segment) docking preparations in case the single-string command link from BCC/Huntsville was lost. *[Launched on 9/10 (3:50:02pm EDT), the cargo vehicle was "standing by" since 9/12, orbiting independently in a holding position to await resumption of adequate NASA ground support after the Hurricane emergency. For remote commanding of Progress, Russia has 12 RGSs (Russian Groundsites) spread west-to-east along northern Russia. They up-command autonomously but are connected to TsUP-Moscow for real-time telemetry & video via fiber optic land lines and the Primyorka geostationary satellite (Molniya sats were not used for 30P). The M-65 resupply drone delivered about 2.4 tons (5357 lbs) of cargo for the ISS crews, including propellants (~1900 lbs) for the Russian thrusters, fresh water (~465 lbs), oxygen and air (~110 lbs), food, and dry cargo (~2865 lbs of spare parts, repair gear, life support and science experiment hardware).]*

CDR Volkov serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out"-to-vacuum cycle on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~4:50pm EDT. Filter bed #1 was regenerated yesterday. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time: 9/8 & 9/9).]*

FE-1 Kononenko conducted the periodic checkout/verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the passageways SM PrK (Transfer Compartment) – RO (SM Working Compartment), PkhO (SM Transfer Tunnel) – RO, PkhO – DC1, PkhO – FGB PGO, FGB PGO – FGB GA, and FGB GA–Node-1.

In Node-1, FE-2 Chamitoff worked on the RED (Resistive Exercise Device), performing the periodic re-calibration of the two pulley canisters. *[The calibration is performed approximately every 2 months and after cable replacement to allow exercise specialists on the ground to update exercise protocols as necessary and track hardware status. Upon receipt of the results of the calibration, the specialists review the data and, assuming favorable engineering analysis, give the crew a GO for their RED exercise session. Calibration of the load settings of the pulley cans is performed with an on-orbit calibration kit with a special calibration tool and steel handles.]*

Volkov & Kononenko had their regular PMCs (Private Medical Conferences), via VHF and RGS comm on DO14. Chamitoff's PMC was yesterday, also over RGS/ VHF.

In the SM, the CDR completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS), today as a discretionary job from the "time permitting" task list. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The FE-1 performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew completed their regular daily 2.5-hr. physical workout program (about half

of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

Later, Greg transferred the exercise data files to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Most of the crew's time today went to preparing and supporting the Progress 30P docking at 2:43pm. Pre-docking activities called for Greg Chamitoff to –

- Close the protective shutters of the science window in the JAXA JPM (JEM Pressurized Module) and in the US Lab (~8:30am),
- Power down the Kenwood amateur radio equipment in the SM, to prevent RF (radio frequency) interference with Progress final approach and docking,
- Activate & configure the A31p laptop to support the transmission of MPEG2 streaming video from the RS via OpsLAN/Ku-band and US assets to Moscow, and
- Power up & reprogram the IWIS ICU (Internal Wireless Instrumentation System Interface Control Unit) with its RSUs (Remote Sensor Units) in the Lab, Node-1, Node-2, FGB and SM, for the automated activation at 2:23pm to monitor dynamic/vibrational responses of the station structure during the docking.

Sergey and Oleg meanwhile prepared their workplace at the TORU control station in the SM and stood by during the docking in readiness to take over control of the cargo ship. *[TORU is the manual mode through which a crewmember can perform necessary guidance functions from the SM in the event of a failure of the KURS automated rendezvous and docking (AR&D) of the Progress. With both KURS systems active by ~1:10pm (Active KURS radar on Progress, passive KURS transponders on SM solar array wing tips), KURS health was determined by a test at ~2:05pm. Should the test have failed, Volkov would have controlled the cargo ship's motions from the TORU control panel with two hand controllers, viewing the approach to the ISS from a Progress point-of-view through the Klest-M television camera mounted on the Progress. Remote TORU control from the ground is not available.]*

After the cargo ship's successful docking, activities by the two cosmonauts include –

- Shutting off TORU and reconfiguring the STTS telephone/telegraph subsystem to normal ops *[the "Voskhod-M" STTS enables telephone communications between the SM, FGB, DC1 and USOS, and also with users on the ground over VHF channels selected by an operator at an SM comm*

panel, via STTS antennas on the SM's outside. There are six comm panels in the SM with pushbuttons for accessing any of three audio channels, plus an intercom channel. Other modes of the STTS include telegraphy (teletype), EVA voice, emergency alarms, Packet/Email, and TORU docking support];

- Conducting the standard one-hour leak checking of the docking vestibule and fuel/oxidizer transfer line interface between Progress and SM *[during leak checking and initial clamp installation, Russian thrusters were inhibited (as was the case during docking)]*;
- Opening the hatches (~4:15pm) and installing the QD (quick disconnect) screw clamps (BZV) of the docking & internal transfer mechanism (SSVP) to rigidize the coupling;
- Performing the standard air sampling inside Progress with the Russian AK-1M air sampler;
- Powering down the spacecraft and installing the ventilation/heating air duct (~5:00pm); and
- Dismantling & removing the video equipment for the TV Ku-band downlink of the docking.

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit (as of this morning, 7:22am EDT [= epoch]):
Mean altitude -- 352.8 km
Apogee height -- 357.5 km
Perigee height -- 348.2 km
Period -- 91.60 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006921
Solar Beta Angle -- 53.6 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 55 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56305

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/29/08 -- ATV de-orbit (nighttime re-entry for observation from 2 NASA planes; 9:12pm)
10/01/08 -- **NASA 50 Years** (official)
10/02/08 – ISS Reboost (~1.8 m/s)
10/10/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)

12:33am
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/24/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) & landing
11/12/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/14/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/16/08
Date:	Tuesday, September 16, 2008 2:17:19 PM
Attachments:	

ISS On-Orbit Status 09/16/08

All ISS systems continue to function nominally, except those noted previously or below.

Post-Hurricane Ike Update: JSC/MCC-H remains closed. BAT/BCC (BCC Advisory Team/Backup Control Center) have maintained monitoring and commanding through JSC assets. The BAT handed over to the BCC team at MSFC but remains powered through JSC assets so IPs (International Partners) have telemetry and commanding through the US assets. Communications with ISS are open from JSC (Link 10A), but on single server/string (no redundancy). BAT/BCC is prepared to handle tomorrow's Progress docking.

CDR Volkov, FE-1 Kononenko and FE-2 Chamitoff began their workday before breakfast with the periodic session of the Russian biomedical routine assessments PZEh-MO-7/Calf Volume Measurement & PZEh-MO-8/Body Mass Measurement, using the IM mass measurement device which Sergey Volkov broke down afterwards for stowage. *[Calf measurements (left leg only) are taken with the IZOG device, a custom-sewn fabric cuff that fits over the calf, using the knee and lower foot as fixed reference pints, to provide a rough index of deconditioning in zero-G and effectiveness of countermeasures. For determining body mass in zero-G, where things are weightless but not massless, the Russian IM "scales" measure the inertial forces that arise during the oscillatory motion of a mass driven by two helical metering springs with known spring constants. By measuring the time period of each oscillation of the unknown mass (the crewmember) and comparing it to the period of a known mass, the crewmember's mass is calculated by the computer and displayed.]*

Sergey Volkov set up the hardware for the Russian MBI-21 PNEVMOKARD experiment and conducted the session, his fourth, which does not allow moving or talking during data recording. Afterwards, Kononenko had his fourth session. The experiment is controlled from the RSE-med A31p laptop, equipped with new software, and uses the TENZOPLUS sphygmomanometer to measure arterial blood

pressure. *[PNEVMOKARD (Pneumocard) attempts to obtain new scientific information to refine the understanding about the mechanisms used by the cardiorespiratory system and the whole body organism to spaceflight conditions. By recording (on PCMCIA cards) the crewmember's electrocardiogram, impedance cardiogram, low-frequency phonocardiogram (seismocardiogram), pneumotachogram (using nose temperature sensors), and finger photoplethismogram, the experiment supports integrated studies of (1) the cardiovascular system and its adaptation mechanisms in various phases of a long-duration mission, (2) the synchronization of heart activity and breathing factors, as well as the cardiorespiratory system control processes based on the variability rate of physiological parameters, and (3) the interconnection between the cardiorespiratory system during a long-duration mission and the tolerance of orthostatic & physical activities at the beginning of readaptation for predicting possible reactions of the crewmembers organism during the their return to ground.]*

Volkov and Kononenko also conducted another session with the Russian biomedical MBI-15 "Pilot-M"/NEURO signal response experiment after setting up the workplace and equipment, with Oleg today's subject and Sergey assisting. Afterwards, the FE-1 closed out the Pilot-M & Neurolab-2000M experiment and stowed the gear. *[MBI-15 requires a table, ankle restraint system, eyeball electrodes for an EOG (electrooculogram), and two hand controllers (RUO & RUD) for testing piloting skill in "flying" simulations on a laptop (RSK1) under stopwatch control, as well as for studying special features of the psychophysiologic response of cosmonauts to the effects of stress factors in flight.]*

The CDR performed the periodic maintenance of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The process will be terminated at ~5:15pm EDT and Bed #2 regeneration performed tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently (last time: 9/8 & 9/9).]*

Sergey also completed the periodic (about twice a month) replenishing of the Elektron's water supply for electrolysis, filling the KOV thermal loops' EDV container with purified water from CWCs (Contingency Water Containers, #1064, #1074) collected by the U.S. CCAA (Common Cabin Air Assembly) dehumidifier. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron micropump shutdown.]*

Gregory Chamitoff had an additional hour set aside for more unpacking and

stowing crew provisions delivered on the ATV-1 (Automated Transfer Vehicle), to consolidate like items, reduce wasted stowage space and make room for additional cargo coming up on ULF2. *[Provisions include such items as athletic shoes, running shorts, T-shirts, sleep shirts, Nitrile gloves, disinfectant wipes, printer paper, office supplies and gray & Kapton tape. All moves were recorded with the BCR (Bar Code Reader) to update the IMS (Inventory Management System), except for pens and pencils.]*

In preparation for tomorrow's Progress 30P docking, Chamitoff spent time in the COL (Columbus Orbital Laboratory) to remove brackets and the FSL (Fluid Science Laboratory) GEOFLOW EC (Experiment Container) in order to prevent its bumping against the bottom of the CEM Upper drawer under the estimated g-load of the docking impact (which could damage shatterable material such as the lamp of the workspace lighting assembly).

In the SM (Service Module), CDR Volkov had almost three hours to work on recovering the KOB2 loop of the Russian SOTR internal thermal control system by replacing its failed 4SPN1 pump panel with a spare unit. Afterwards, the two micro pumps were tested with a manual pump assembly and a pressure gauge. Last 4SPN1 panel replacement: 4/28/08. *[Each of the two SOTR KOB loops has two redundant pump panels with two redundant micro pumps each. While in the early years of Mir and ISS the pumps were integral to the SPN panels, the current design allows them to be replaced without requiring an entire new SPN block.]*

The FE-2 continued the software upgrading on three onboard PDAs (Personal Digital Assistants), after their charging,- two with BCR (Barcode Reader) software (replacing the previous "Dolphin" BCRs), the third with WINS (Wireless Network Survey) software. *[The loading had to be preceded by powering off the RF LAN (Radio Frequency Local Area Network) Access Point (Proxim) and activation of the new Netgear WAPs (Wireless Access Points) in Node-1 and Node-2.]*

Afterwards, Greg moved the wireless card-equipped SSC-14 (Station Support Computer 14) closer to the Node-2 hatch for more signal strength, activated the laptop and disconnected the ISL (Integrated Station OpsLAN) Ethernet "dragthrough" cables from the Node-2 ISL interface panel for stowage.

Chamitoff also looked for the Shuttle BOB (Breakout Box) and verified its readiness with the tools (fuses, test jumper, etc.) needed for upcoming Flowmeter IFM (In-Flight Maintenance) tasks.

Oleg Kononenko took the periodic readings of potentially harmful atmospheric contaminants in the SM, using the CMS (Countermeasure System), a component of the SKDS GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, today

using preprogrammed microchips to measure for Isopropanol (“rubbing alcohol”, C_3H_8O), Methanol (“wood alcohol”, CH_3OH) and Toluene (methylbenzene, C_7H_8).

After FE-2 Chamitoff set up and configured the usual equipment to downlink Russian analog video signals from the RS (Russian Segment) via streaming video on US Ku-band, he and the FE-1 checked it out with network “ping” tests. The supportive A31p laptop was later turned off again. Purpose of the video setup is to cover tomorrow’s Progress M-65/30P arrival. *[The equipment involves the KL-211 MPEG-2 Encoder, the RSS1 A31p laptop (for monitoring the digital video) and a U. S. SSC (Station Support Computer) laptop (for converting the analog TV from Russian PAL mode to U.S. NTSC). Transmission tests with the ground followed (9:45am – 12:45pm EDT), checking out connections and the digital video transmission over JSL/Ethernet plus OCA/Ku-Band to MCC-Houston and from there to Moscow via the ESA Gateway for COL-CC/Oberpfaffenhofen transmission to at TsUP-Moscow, plus transfer of the USOS analog video of the RS ISS video downlink via Streambox 2 to NISN (i.e., the Moscow Ostankino communication hub).]*

Kononenko took the periodic photographs of the barley plants growing in the BIO-5 Rasteniya-2 ("Plants-2") Lada-13 greenhouse, using the Nikon D2X photo camera with F=17-55 mm lens, then downlinked the images via Regul BSR-TM.

After recharging the SONY HVR-Z1J digital high-definition camcorder’s battery, Oleg downlinked the video footage of “Life on ISS” filmed over the weekend for public viewing (on Russia’s “Vesti” 24 TV news channel in their “Kosmos” segment) to TsUP over RGS (Russian Groundsite) at ~3:50pm EDT.

In the SM, Sergey completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS), today as a discretionary job from the “time permitting” task list. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The crew completed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

Later, Oleg transferred the exercise data files to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM

storage medium (done six times a week).

CDRA Failure Update: Specialists are pursuing a theory that the CSV (CO_2 Selector Valve), which selects between the two Carbon Dioxide Removal Assembly absorption channels, gets to its latching positions (A/B) OK, but without contacting the position sensor at that position within the time required to produce the proper telemetry reading, thus showing "in transition", i.e., seemingly being stuck. To test this theory, the ground today was to command CDRA activation after the crew connected the ITCS LTL (Low Temperature Loop) jumper for cooling. If the activation was successful, CDRA was to be operated for two cycles (channel switches) to get the correct timing data on the CSV and to bring down CO_2 levels (last night 3.7 mmHg). If unsuccessful, CDRA was to be turned off and the LTL hose taken off again. More to come.

Progress Docking: Progress M-65/30P continues to "hold" in orbit on its Flight Day 7, in a good standby mode configuration. At ~3:22pm today, the spacecraft is to perform a small phasing boost (DV5, 4 m/s). Docking, originally scheduled on 9/12, has been deferred until tomorrow (9/17), see timeline below. To prepare for the docking and the associated reduction in solar array output, Flight Controllers are setting up a series of commands for power-downs on board (mostly shell heaters), power reconfigurations and attitude control handovers from CMGs (Control Moment Gyroscopes) to RS (Russian Segment) thrusters & back.

Timeline for Progress 30P Rendezvous & Docking on 9/17 *(all times EDT):*

- ISS attitude handover to RS 11:10am
- ISS mnvr to dock attitude 12:20-1:00pm
- Progress Kurs-A Activation (T1) 1:08:30pm
- SM Kurs-P Activation (T1) 1:10 :30pm
- Good Kurs-P data at 80 km 1:34:24pm
- Kurs-A/Kurs-P Short Test @ 15km 1:55pm
- Range = 9km - VHF-2 activation 2:00pm
- Range = 8km – Progress TV act. 2:00:44pm
- AR&D Flyaround mode start 2:17:17pm
- AR&D Stationkeeping start 2:26:17pm
- AR&D Final Approach start 2:34pm
- Local Sunrise 2:35:46pm
- RGS AOS 2:41pm
- **30P Docking at SM aft port 2:43pm**
- Local Sunset 3:04pm
- ISS mnvr to US momentum mgmt. 3:03-3:43pm
- ISS attitude handover to USOS 4:25pm.

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this “Gateway” website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit (as of this morning, 8:32am EDT [= epoch]):
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Perigee height -- 348.2 km
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Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006994
Solar Beta Angle -- 53.7 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 36 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56290

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/17/08 -- Progress M-65/30P docking (~2:43pm EDT)
09/29/08 -- ATV de-orbit (nighttime re-entry for observation from 2 NASA planes; 9:12pm)
10/01/08 -- **NASA 50 Years** (official)
10/10/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4) 12:33am
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
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11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)

03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
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05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/15/08
Date:	Monday, September 15, 2008 12:00:32 PM
Attachments:	

ISS On-Orbit Status 09/15/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 22 of Increment 17.*

Post-Hurricane Ike Update: JSC/MCC-H remains closed. Part of the building roof of Mission Control is damaged, but there was no flooding, and the Rideout Team of ~65 persons has kept computers up. Communications with ISS are open from JSC via the BCC (Backup Control Center) at MSFC/Huntsville (Link 10A), on single string (no redundancy). As of last night: "If JSC opens this week, it will be for limited operations and additional recovery only." Efforts are underway to get in touch with all employees in outlying areas to ascertain their status, needs for assistance and return-to-work estimates.

CDR Volkov and FE-1 Kononenko conducted another session with the Russian biomedical MBI-15 "Pilot-M"/NEURO signal response experiment after setting up the workplace and equipment, with Volkov today's subject and Kononenko assisting. Afterwards, the Pilot-M & Neurolab-2000M gear was left connected for Oleg's session tomorrow. *[MBI-15 requires a table, ankle restraint system, eyeball electrodes for an EOG (electrooculogram), and two hand controllers (RUO & RUD) for testing piloting skill in "flying" simulations on a laptop (RSK1) under stopwatch control, as well as for studying special features of the psychophysiologic response of cosmonauts to the effects of stress factors in flight.]*

FE-2 Chamitoff ended his fourth run with the NASA/JSC experiment NUTRITION w/ Repository by collecting a final urine sample upon wakeup for storage in the MELFI (Minus-Eighty Laboratory Freezer for ISS). The sampling kit was then stowed away. *[The current NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional*

assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]

Also on Gregory's schedule for today was a two-hour activity of reloading three onboard PDAs (Personal Digital Assistants), after their charging, with new applications,- two with BCR (Barcode Reader) software (replacing the previous "Dolphin" BCRs), the third with WINS (Wireless Network Survey) software.

Oleg Kononenko worked on the Service Module toilet systems (SM ASU), performing the monthly 30-min. maintenance/servicing of the facility, changing out replaceable ASU parts with new components, i.e., the urine receptacle (MP) and a filter insert (F-V). The old parts were discarded as trash.

Chamitoff performed the periodic routine maintenance on the prime CSA-CP (Compound Specific Analyzer-Combustion Products) instrument, changing out its battery and zero-calibrating the unit (to eliminate drift in the combustion sensor), before returning the CSA-CP to its original location at the SM Central Post.

Afterwards, Greg had another hour reserved for unpacking and stowing crew provisions delivered on the ATV-1 (Automated Transfer Vehicle), to consolidate like items, reduce wasted stowage space and make room for additional cargo coming up on ULF2. *[Provisions include such items as athletic shoes, running shorts, T-shirts, sleep shirts, Nitrile gloves, disinfectant wipes, printer paper, office supplies and gray & Kapton tape. All moves were recorded with the BCR (Bar Code Reader) to update the IMS (Inventory Management System), except for pens and pencils.]*

The FE-1 conducted an audit/inventory of equipment items stowed in the FGB behind panels, going by an uplinked listing of 48 items with serial numbers and bar codes. *[The hardware includes such items as filters, BK-3M oxygen tanks, GA O_2 gas analyzer for Elektron, pressure sensors, absorption cartridges, cables and "Pinguin-3" suits with shoes.]*

Later, Kononenko and Volkov started a new round of periodic preventive maintenance of ventilation systems in the RS (Russian Segment). *[Oleg worked in the FGB cleaning the ventilation screens of panels 201, 301 & 401, while Sergey spent time in the SM to change out the PF1-4 dust collector filters.]*

After recharging the SONY HVR-Z1J digital high-definition camcorder's battery, Kononenko downlinked the video footage of "Life on ISS" filmed last week for public viewing (on Russia's "Vesti" 24 TV news channel in their "Kosmos" segment) to TsUP over RGS (Russian Groundsite) at ~1:33pm EDT.

The two cosmonauts performed the periodic (monthly) functional closure test of the Vozdukh CO_2 (carbon dioxide) removal system's spare emergency vacuum valves (AVK), in the spare parts kit. See CDRA item, below. *[The AVKs are crucial because they close the Vozdukh's vacuum access lines in the event of a malfunction in the regular vacuum valves (BVK) or a depressurization in the Vozdukh valve panel (BOA). Access to vacuum is required to vent CO_2 during the regeneration of the absorbent cartridges (PP).*

Greg Chamitoff meanwhile worked in the COL (Columbus Orbital Laboratory) to prepare the future locations of the HRF-1 (Human Research Facility 1) and HRF-2 racks for their relocation from the US Lab. *[The two U.S. racks will be transferred to locations A4 & F4 later this month.]*

In the SM, Oleg completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS), today as a discretionary job from the "time permitting" task list. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Sergey performed the daily IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Working off the Russian at-crew's-discretion task list, FE-1 Kononenko conducted the regular status check of the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (barley) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

The crew completed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

Later, Oleg transferred the exercise data files to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

CDRA Failure: Yesterday, the U.S. CDRA (Carbon Dioxide Removal Assembly)

was reported failed after Flight Controllers tried for 13 hours (allowing for cooldown) to get the CSV (CO_2 Selector Valve), which selects between the two CDRA absorption channels, back into operation after it failed between its two positions (A/B). The crew then disconnected the ITCS LTL (Internal Thermal Control System/ Low Temperature Loop) cooling jumper. The failure of the CSV, which has drawn attention in the past because of "sticking", also affected the correct function of the ASV (Air Supply Valve). With the CSV's spring not able to hold the valve in either of its two positions, CDRA will not operate. The Vozdukh CO_2 scrubber in the Russian Segment continues to run nominally. If it should turn out that Vozdukh cannot maintain CO_2 partial pressure below ~4.5 mmHg, the crew has a large supply of LiOH (Lithium Hydroxide) absorber/filter canisters at hand.

Progress Docking: Progress M-65/30P continues to "hold" in orbit on its Flight Day 6. Docking, originally scheduled on 9/12, has been deferred until Wednesday (9/17), see new timeline below. To prepare for the docking and the associated reduction in solar array output, BCC Flight Controllers will command a series of power-downs on board (mostly shell heaters), power reconfigurations and attitude control handovers from CMGs to RS thrusters & back.

Timeline for Progress 30P Rendezvous & Docking on 9/17 *(all times EDT):*

- Correction burn DV5 (4.00 m/s) 3:22pm (9/16)
- ISS attitude handover to RS 11:10am (9/17)
- ISS mnvr to dock attitude 12:20-1:00pm
- Progress Kurs-A Activation (T1) 1:08:30pm
- SM Kurs-P Activation (T1) 1:10 :30pm
- Good Kurs-P data at 80 km 1:34:24pm
- Kurs-A/Kurs-P Short Test @ 15km 1:55pm
- Range = 9km - VHF-2 activation 2:00pm
- Range = 8km – Progress TV act. 2:00:44pm
- AR&D Flyaround mode start 2:17:17pm
- AR&D Stationkeeping start 2:26:17pm
- AR&D Final Approach start 2:34pm
- Local Sunrise 2:35:46pm
- RGS AOS 2:41pm
- **30P Docking at SM aft port 2:43pm**
- Local Sunset 3:04pm
- ISS mnvr to US momentum mgmt. 3:03-3:43pm
- ISS attitude handover to USOS 4:25pm.

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this “Gateway” website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit (as of this morning, 8:10am EDT [= epoch]):
Mean altitude -- 352.9 km
Apogee height -- 357.6 km
Perigee height -- 348.2 km
Period -- 91.60 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006976
Solar Beta Angle -- 52.9 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 27 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56274

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/17/08 -- Progress M-65/30P docking (~2:43pm EDT)
09/29/08 -- ATV de-orbit (nighttime re-entry for observation from 2 NASA planes; 9:12pm)
10/01/08 -- **NASA 50 Years** (official)
10/10/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4) 12:33am
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) & landing
11/12/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/14/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)

04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/14/08
Date:	Sunday, September 14, 2008 11:39:42 AM
Attachments:	

ISS On-Orbit Status 09/14/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – off-duty day for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff. Ahead: Week 22 of Increment 17.*

Today's on-orbit activities, monitored from the BCC (Backup Control Center) in Huntsville, AL, are expected to include the following tasks (pending confirmation of execution):

Gregory Chamitoff starting out on Part 2 of his session with the NASA/JSC experiment NUTRITION w/Repository. This is an all-day session, the fourth for Greg, of collecting urine samples several times for 24 hrs through first void tomorrow morning, labeling each sample and storing it in the MELFI (Minus Eighty Degree Laboratory Freezer for the ISS), Dewar 1/Tray B. *[The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by supercold MELFI dewars), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

Sergey Volkov performing the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM (Service Module), including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Checkups by the CDR today also include the Russian POTOK-150MK (150 micron)

air filter unit of the SM's SOGS air revitalization subsystem, gathering weekly data on total operating time & "On" durations for reporting to TsUP-Moscow.

For Oleg Kononenko, the Russian discretionary "time permitting" task list called for another run of the Russian DZZ-2 "Diatomeya" ocean observations program on, using the NIKON-F5 DCS still camera with f85mm lens and the HDV camcorder from SM window #7 to record color field patterns in target water areas and current atmospheric conditions above them. *[Uplinked target zones in the Atlantic Ocean were the Argentine shelf to the Cape of Good Hope (South Africa) and in the Pacific Ocean the area west of the Peru-Chile coast.]*

Also on the at-crew's-discretion task list for the FE-1 was the regular status check of the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (barley) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

The crew completed their regular daily 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) is activated intermittently for two half-cycles to control $ppCO_2$ levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

Progress Docking: Progress M-65/30P is currently "holding" in orbit on its Flight Day 5. Docking, originally scheduled on 9/12, has been deferred until Wednesday (9/17), see new timeline below.

Timeline for Progress 30P Rendezvous & Docking on 9/17 *(all times EDT):*

- Correction burn DV5 (4.00 m/s) 3:22pm (9/16)
- ISS attitude handover to RS 11:10am (9/17)
- ISS mnvr to dock attitude 12:20pm
- Progress Kurs-A Activation (T1) 1:08:30pm
- SM Kurs-P Activation (T1) 1:10 :30pm
- Good Kurs-P data at 80 km 1:34:24pm
- Kurs-A/Kurs-P Short Test @ 15km 1:55pm
- Range = 9km - VHF-2 activation 2:00pm

- Range = 8km – Progress TV act. 2:00:44pm
- AR&D Flyaround mode start 2:17:17pm
- AR&D Stationkeeping start 2:26:17pm
- AR&D Final Approach start 2:34pm
- Local Sunrise 2:35:46pm
- RGS AOS 2:41pm
- **30P Docking at SM aft port 2:43pm**
- Local Sunset 3:04pm
- ISS attitude handover to USOS 4:30pm.

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit (as of this morning, 9:12am EDT [= epoch]):
Mean altitude -- 353.0 km
Apogee height -- 357.7 km
Perigee height -- 348.3 km
Period -- 91.60 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006988
Solar Beta Angle -- 51.4 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 22 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56259

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/17/08 -- Progress M-65/30P docking (~2:43pm EDT)
09/29/08 -- ATV de-orbit (nighttime re-entry for observation from 2 NASA planes; 9:12pm)
10/01/08 -- **NASA 50 Years** (official)
10/10/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4) 12:33am
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) & landing
11/12/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/14/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**

11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
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05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/13/08
Date:	Saturday, September 13, 2008 12:26:53 PM
Attachments:	

ISS On-Orbit Status 09/13/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – off duty day for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff.*

Hurricane Ike: NASA-JSC/MCC-Houston is closed. Control of ISS USOS (US Segment) operations has been transferred to the BCC (Backup Control Center) at MSFC-Huntsville which has voice and command/telemetry capability for the US systems via S-band with single-string capability (no backup) and "cold" sparing (i.e., requiring time for repair turn-around). Columbus and Kibo/JEM are in Safe mode or powered down for the duration of BCC mode. The crew's timeline for today and the next few days do not include activities that need significant interaction with US ground specialists.

Progress Docking: Progress M-65/30P is currently "holding" in orbit on its Flight Day 4. Docking, originally scheduled yesterday, has been deferred until Wednesday (9/17), see new timeline below.

On-orbit activities today are expected to include the following tasks (pending confirmation of execution):

- Part 1 of Gregory Chamitoff's fourth session with the NASA/JSC experiment NUTRITION w/Repository, for blood collection only, for which he had to forego exercising and food intake since yesterday for eight hours. Later today, the FE-2 would set up the equipment for the 24-hour urine collections which start with the first void early tomorrow morning. *[After performing self-phlebotomy, i.e., drawing blood samples (from an arm vein), the samples are first allowed to coagulate in the Repository for 20-30 minutes, then spun in the HRF RC (Human Research Facility/Refrigerated Centrifuge) and finally placed in MELFI (Minus-Eighty Laboratory Freezer for ISS). No thruster activity is allowed during the blood drawing. The RC will later be powered off after a temperature reset to limit wear on the compressor, and*

cleaned. The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by supercold MELFI dewars), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]

- Thorough interior cleaning of the station's living areas, a 3-hr. job performed regularly every week. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the SM (Service Module) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

- Included in the house cleaning usually is a maintenance inspection & cleaning on fan grilles/screens in the FGB (TsV1), SM (VPkhO, VPrK, FS5, FS6 & FS9), DC1 "Pirs" (V3), as well as in the COL (Columbus Orbital Laboratory).

- Routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including checking the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem, gathering weekly data on total operating time & "On" durations for reporting to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

- Filling out the regular FFQ (Food Frequency Questionnaire) by Chamitoff, his twelfth, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew*

health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]

- Conducting the crewmembers' regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer, TVIS treadmill, RED resistive exercise device, and VELO bike with bungee cord load trainer. Exercise data files are later transferred to the MEC laptop by Kononenko for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

- As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) is activated intermittently for two half-cycles to control ppCO_2 levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

- In addition, regular routine uplinks & comm exchanges from TsUP-Moscow with the ISS RS (Russian Segment) during RGS (Russian Groundsite) comm passes are continuing. On a daily basis, they include –
    - SM power bus checks,
    - SD (Smoke Detector) tests,
    - IP-1 Air Flow Sensor tests,
    - Onboard time check & synchronization via Regul uplink,
    - State Vector update,
    - Activation/deactivation of KOB1(2) if temperatures on any of the SM batteries exceed op limits,
    - Activation/deactivation of FGB UPLU (program-logic control assembly),
    - TVM (terminal computer system) checks via data dumps,
    - Soyuz BILU (linear accelerometer) test, and
    - Uplinks to the Russian SPP (automated timeline sequencer) and other sequencers for special events such as SM & FGB battery moding.

Timeline for Progress 30P Rendezvous & Docking on 9/17 *(all times EDT):*

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- RGS AOS 2:41pm
- **30P Docking at SM aft port 2:43pm**
- Local Sunset 3:04pm
- ISS attitude handover to USOS 4:30pm.

No Weekly Science Summary available yet for Week 21.

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Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 35 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56243

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
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02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/12/08
Date:	Friday, September 12, 2008 2:03:25 PM
Attachments:	

ISS On-Orbit Status 09/12/08

All ISS systems continue to function nominally, except those noted previously or below. *The crew has an off-duty day.*

Hurricane Ike: Hurrican Ike's landfall is predicted for tonight at Galveston, TX, and NASA-JSC at nearby Clear Lake is closed. Control of operations for the US systems on the ISS has been handed over to the BAT (Backup Advisory Team), a subset of the FCT (Flight Control Team) temporarily stationed near Austin, TX, with command & telemetry capability for the US systems while MCC-H remains powered. When MCC-H powers down completely tonight due to storm conditions (expected to be severe), the BCC (Backup Control Center) at MSFC-Huntsville will assume control, with voice and command/telemetry capability for the US systems via S-band in single-string capability (no backup), with "cold" sparing (i.e., requiring time for repair turn-around). Since the IPs (International Partners) do not have that capability for JEM/Kibo or Columbus, both Columbus and Kibo are in Safe mode or powered down for the duration of BCC mode. Changes were made to the crew's timeline for today and the next few days to remove activities that need significant interaction with US ground specialists.

Progress Docking Deferred: Progress M-65/30P is currently in orbit on its Flight Day 3. Due to the complexity of operations for the USOS (US Segment) to support a Progress (or Soyuz) docking, which involves configuring solar arrays, maintaining power balance, attitude handovers, etc., the M-65 docking scheduled for today has been deferred until no earlier than 9/17 (Wednesday, see new timeline below). The uncrewed cargo vehicle will be "loitering" in a safe orbit until commanded in for docking.

After connecting up the Telescience PK-3+ hardware yesterday, CDR Volkov today transferred digital video from the last session (7/30) of the Russian TEKh-20 Plazmennyi-Kristall/PK-3+ (Plasma Crystal-3+) experiment to the BSPN payload server (TS laptop). *[Main objective of PK-3: studying non-linear dust plasma wave propagation and dispersion ratio at a specified power of an alternating electric*

field, pressure, and a varied number of particles, controlled by the experimenter. The research experiment was performed in semi-automatic mode with particles having a diameter of 9.19 µm under pressures of 20, 40, and 80 Pa (Pascal).]

Gregory Chamitoff took measurements for the regular atmospheric status check for $ppCO_2$ (Carbon Dioxide partial pressure) in the Lab, SM at panel 449 and COL (Columbus Orbital Laboratory) plus battery ticks, using the hand-held CDMK (CO_2 Monitoring Kit, #1002). The unit was then deactivated and returned to its stowage location (LAB1S2). *[Purpose of the 5-min activity is to trend with MCA (Major Constituents Analyzer), i.e., to correlate the hand-held readings with MCA measurements.]*

FE-1 Kononenko meanwhile completed another radiation data checkup for accumulated flux & dose rate data with the Matryoshka-R radiation payload (RBO-3-2) and its LULIN-5 electronics box.

Sergey Volkov performed an inspection of the tread patch which the crew installed on 8/11 in an improvised repair of the TVIS treadmill running belt.

In the US Airlock, the FE-2 terminated the 85-day maintenance cycle on the first two EMU (Extravehicular Mobility Unit) batteries (#2072, #2067) in BCM3 (Battery Charger Module 3) and BCM4. *[The periodic battery maintenance consists of fully discharging and then recharging the storage units to prolong their useful life. After end of the maintenance cycle, Greg restored the SSC laptop, which is used in DOS mode for the automated procedure, to nominal ops.]*

Oleg took care of the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

In the SM, Sergey completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS), today as a discretionary job from the “time permitting” task list. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Also from the at-crew’s-discretion task list, Oleg Kononenko conducted the regular status check of the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (barley) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

A third suggested task list job was for Sergey to conduct the periodic time synchronization between the RSS1 laptop and BSPN payload server, after a functionality test by checking data comm between the two computers and synching RSS1 to station time with the RSCE PingMaster application. The CDR then downlinked BSPN log files for ground review.

At ~9:15am EDT, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU/*Glavnaya operativnaya gruppa upravleniya* = *"Chief Operative Control Group"*), including Shift Flight Director (SRP), at TsUP-Moscow via S-band/audio, phone-patched from Houston and Moscow.

At ~9:30am, Sergey & Oleg linked up with TsUP stowage specialists via S-band to conduct the weekly IMS tagup, discussing inventory & stowage issues, equipment locations and cargo transfers.

Before sleeptime tonight, Chamitoff is to set up NASA's NUTRITION/Repository experiment hardware for his fourth session scheduled tomorrow. For the phlebotomy (blood sample draw), Greg has to start fasting 8 hrs before, i.e., tonight, with only water consumption allowed. *[The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by supercold MELFI dewars), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (CDR, FE-1), and RED resistive exercise device (CDR, FE-1, FE-2).

Later, Oleg transferred the exercise data files to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control $ppCO_2$ levels. This configuration for the daily ops does not require

connecting & disconnecting the ITCS cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

Timeline for Progress 30P Rendezvous & Docking on 9/17 *(all times EDT):*

- Correction burn DV5 (4.00 m/s) 3:22pm (9/16)
- ISS mnvr to dock attitude 12:20pm (9/17)
- Progress Kurs-A Activation (T1) 1:08:30pm
- SM Kurs-P Activation (T1) 1:10 :30pm
- Good Kurs-P data at 80 km 1:34:24pm
- Kurs-A/Kurs-P Short Test @ 15km 1:55pm
- Range = 9km - VHF-2 activation 2:00pm
- Range = 8km – Progress TV act. 2:00:44pm
- AR&D Flyaround mode start 2:17:17pm
- AR&D Stationkeeping start 2:26:17pm
- AR&D Final Approach start 2:34pm
- Local Sunrise 2:35:46pm
- RGS AOS 2:41pm
- **30P Docking at SM aft port 2:43pm**
- Local Sunset 3:04pm

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit (as of this morning, 8:26am EDT [= epoch]):
Mean altitude -- 353.0 km
Apogee height -- 357.7 km
Perigee height -- 348.3 km
Period -- 91.60 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007025
Solar Beta Angle -- 46.4 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 36 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56227

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/17/08 -- Progress M-65/30P docking (~2:43pm EDT)

09/29/08 -- ATV de-orbit (nighttime re-entry for observation from 2 NASA planes; 9:12pm)
10/01/08 -- **NASA 50 Years** (official)
10/10/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4) 12:33am
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) & landing
11/12/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/14/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/11/08
Date:	Thursday, September 11, 2008 3:01:06 PM
Attachments:	

ISS On-Orbit Status 09/11/08

All ISS systems continue to function nominally, except those noted previously or below. *>>>Today 46 years ago (1962), President John F. Kennedy visited MSFC/ Huntsville for a first-hand look at our progress with the big Saturn launch vehicles. <<<*

Hurricane Ike: JSC-Houston has gone officially to preparedness Level 2, closing down at 1:00pm EDT, with a minimal team keeping MCC-H powered. If the storm becomes more severe, as expected, MCC-H will be powered down, and the BCC (Backup Control Center) in Huntsville/Alabama will take over tonight.

Progress M-65/30P launched nominally yesterday at Baikonur at 3:50:02pm EDT, when ISS was leading with 236 deg phase angle. Ascent was nominal, all appendages (antennae & solar arrays) deployed nominally, and the vehicle reached orbital insertion at 3:58:51pm. Corrective maneuvers DV1 & DV2 were conducted as per plan at 7:30pm (delta-V 14.86 m/s) and 8:16pm (16.81 m/s). A third burn will follow later today, with time and magnitude depending on the final docking parameters, because as a consequence of the foreseeable lack of adequate JSC ground support, our Russian partners have agreed not to attempt the 30P docking tomorrow as planned but to delay it until NASA has regained full ground control to support it (e.g., with ISS attitude control commanding, power-downs, etc.). *[Note: Progress is equipped with sufficient power (solar arrays) and maneuvering propellants to allow quite extended station-keeping. The cargo ship will deliver more than 2.3 tons of various supplies to the ISS, including oxygen, water and food supplies, propellant, consumables, scientific hardware, spares and other equipment. The spacecraft was injected into a reference near-earth elliptical orbit with 51.65° inclination, min/max altitudes of 187.1/241.4 km and 89 min revolution. Onboard systems are operating as designed as the "chase" is on.]*

In preparation for BCC Mode of operation during the hurricane, a number of configuration changes have been executed onboard. These include –

- COL (Columbus Orbital Laboratory) switched to Safe mode (i.e., video

equipment & payloads deactivated due to lack of Ku-band & command/ telemetry insight),

- Kibo modules powered down (because no JAXA SSIPC/Tsukuba command capability during BCC), and
- JEM SD BITs (Smoke Detector built-in tests) to be conducted by BCC (no automatic capability),
- US CDRA (Carbon Dioxide Removal Assembly) & TCCS (Trace Contaminant Control System) remaining active,
- Starboard TRRJ (Thermal Radiator Rotary Joint) repositioned to -15 deg,
- Switching the ITCS (Internal Thermal Control System) to dual-loop operation (MTL/LTL), etc.

Upon wake-up, CDR Volkov terminated his ninth MBI-12 SONOKARD experiment session for the long-term Russian sleep study, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

In the SM (Service Module), Volkov performed Part 5 (of 5) of the scheduled R&R (removal & replacement) of the renewable condensate transfer lines (SMOK) of the Russian SOTR Thermal Control System, today replacing the SMOK components between the SK1 valve and the SBK1 condensate collector tank, both behind panel 131.

After going through the usual TORU (teleoperator control system) and TVS (television system) tests for the docking, Volkov & Kononenko had time set aside to discuss particulars of the drill with ground specialists.

FE-2 Chamitoff had on his timeline the relocation of the CHeCS (Crew Health Care Systems) rack in the US Lab from the LAB1D4 position to the LAB1S4 position, which required him and the assisting FE-1 to –

- Clear stowage items from the D4 rack front and from the S4 empty rack bay;
- Clear a 50in x 72in. translation path needed for the rack transfer of protruding items,
- Relocate the CHeCS rack from position D4 to S4,

- Mate CHeCS umbilicals, and
- Restow any items temporarily relocated before the transfer to their original locations.

Winding up the his extensive anti-virus campaign of scanning, cleaning and reloading RS (Russian Segment) crew support laptops, and flash memory cards with new Norton antivirus software, FE-1 Kononenko today worked on the RSK1, RSK2, RSS1, RSS2, RSE1 and RSEmed laptops to verify full elimination of the W32.Gammima.AG virus from all storage media.

Gregory Chamitoff completed the weekly 10-min. CWC (Contingency Water Container) inventory as part of on-going WRM (Water Recovery & Management) assessment of onboard water supplies. Updated "cue cards" based on the crew's water calldowns are sent up every other week. *[The new card (17-0002Y) lists 30 CWCs (~1095.0 L total) for the four types of water identified on board: technical water (362.3 L, for flushing only because of* Wautersia *bacteria), potable water (706.7 L, incl. 174.6 L currently on hold), condensate water (9 L), waste/EMU dump and other (17 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

Sergey Volkov prepared for an upcoming new session with the Russian TEKh-20 Plazmennyi-Kristall/PK-3+ (Plasma Crystal-3+) experiment, setting up the Telescience PK-3+ hardware and its cabling in the SM on panel 230. Connecting to the BSPN payload server and transferring digital video from the last session (7/30) is scheduled tomorrow. This activity was deferred from 8/4. *[Main objective of PK-3 is to study non-linear dust plasma wave propagation and dispersion ratio at a specified power of an alternating electric field, pressure, and a varied number of particles, controlled by the experimenter. The research experiment was performed in semi-automatic mode with particles having a diameter of 9.19 µm under pressures of 20, 40, and 80 Pa (Pascal).]*

In the SM, Kononenko completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Oleg also took care of the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

Later, Greg transferred the exercise data files to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

During Kononenko's VELO exercising, the CDR filmed him with the video camcorder for public airing by the Russian Vesti 24 TV news channel in their "Kosmos" segment as Part 2 of several "Life aboard ISS" videos to be recorded this week. *[Yesterday's filming featured the CDR performing the DYKHANIE experiment. More scenes, such as food preparation, having a meal, performing Diatomeya/Uragan experiments and other views of interest to "Kosmos" viewers, will be filmed over the weekend, for downlink to Moscow on 9/15 and 9/17.]*

As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control $ppCO_2$ levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

Conjunction Event: Another close pass of a piece of debris of the Kosmos-2421 satellite is predicted for early tomorrow morning, at a TCA (Time of Closest Approach) of ~2:00am EDT, with a very low probability of collision ("Yellow" box; >13 km). More tracking is currently underway. Since a DAM (Debris Avoidance Maneuver) with the SM main propulsion cannot be performed under the current ground conditions, the crew would go to the Safe Haven scenario and retreat to the Soyuz crew return vehicle if necessary. *[For the shelter mode, the crew would relocate the Airlock PCS (Portable Computer System) laptop to the SM, then close out and egress the two Kibo modules (JLP, JPM), COL, Node-2, US Lab, Node-1/ PMA-1, close all hatches to the RS, which contains ECLSS, and then spent a short time in the Soyuz until after TCA.]*

CEO (Crew Earth Observations) photo targets uplinked for today were **High Central Andean Glaciers, S. America** *(this morning pass over the central Andes Mountains provided an opportunity to photograph small glaciers and icefields near the summits. Some scattered clouds were likely present over the range. Overlapping nadir frames of the mountain peaks, taken along track, were*

requested as the ISS traveled SE-ward along the range. This approach should have captured many of the glaciers of interest), and **Patagonian Glaciers, S. America** *(Gregory had a morning pass over the ranges of Patagonia. Photography of glaciers and icefields near the mountain peaks along the west side of the mountains was requested. Some scattered clouds were expected to be present. Overlapping nadir frames of the mountain flanks and peaks, taken along track, were requested as ISS traveled E-SE over the mountains. This approach should have captured many of the glaciers of interest)*.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit (as of this morning, 9:29am EDT [= epoch]):
Mean altitude -- 353.0 km
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Perigee height -- 348.3 km
Period -- 91.60 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007018
Solar Beta Angle -- 43.1 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 40 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56212

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/29/08 -- ATV de-orbit (nighttime re-entry for observation from 2 NASA planes; 9:12pm)
10/01/08 -- **NASA 50 Years** (official)
10/10/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4) 12:33am
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) & landing
11/12/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
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11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit

02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
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02/26/09 -- STS-119/Discovery/15A landing (nominal)
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10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/10/08
Date:	Wednesday, September 10, 2008 11:49:33 AM
Attachments:	

ISS On-Orbit Status 09/10/08

All ISS systems continue to function nominally, except those noted previously or below.

Upon wakeup, FE-1 Kononenko terminated his ninth SONOKARD experiment session for the long-term Russian sleep study MBI-12, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. Sergey Volkov's new MBI-12 session starts tonight (~5:20pm). *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

CDR Volkov set up the equipment for his fourth session with the Russian experiment MBI-18 DYKHANIE ("Respiration", "Breathing"), then undertook the session, controlled from the RSE-Med laptop, followed later by FE-1 Kononenko who also completed the approximately monthly experiment for the fourth time. The crewmembers took photographs of each other working the hardware, then closed down the payload and stowed it. *[Dykhanie-1 uses two body belts (PG-T/thoracic, PG-A/abdominal), a calibrator, resistor, mouthpiece, etc., to study fundamental physiological mechanisms of the external breathing function of crewmembers under long-duration orbital flight conditions. During the experiment, physiological measurements are taken and recorded with a pneumotachogram, a thoracic pneumogram, an abdominal pneumogram, and pressure data in the oral cavity. All experimentally derived plus salient environmental data along with personal data of the subject are recorded on PCMIA card for return to the ground at end of the Expedition. Objectives include determining the dynamics of the relationship between thoracic (pectoral) and abdominal breathing function reserves and their*

realization potential during spontaneous breathing, the coordinated spontaneous respiratory movements in terms of thoracic and abdominal components of volumetric, time & rate parameters of spontaneous respiratory cycle, identification of the features of humoral-reflex regulation of breathing by dynamics of ventilation sensitivity of thoracic and abdominal components to chemoreceptor stimuli, etc. Overall, the experiment is intended to provide a better understanding of the basic mechanisms of pulmonary respiration/gas exchange gravitational relations of cosmonauts.]

Volkov's Dykhanie session was filmed by Kononenko with a video camcorder for public airing by the Russian Vesti 24 TV news channel in their "Kosmos" segment as part of several "Life aboard ISS" videos to be recorded in the next few days. *[Tomorrow's filming will feature the FE-1 exercising, followed over the weekend by scenes showing food preparation, having a meal, performing Diatomeya/Uragan experiments and other views of interest to "Kosmos" viewers.]*

Later in the day, Kononenko & Volkov undertook another session with the MedOps protocol MO-5, "Cardiovascular Evaluation during Graded Exercises" on the VELO cycle ergometer, a standard Russian fitness test, assisting each other as CMO (Crew Medical Officer). (Last time done: 7/3). *[The 50-min assessment, supported by ground specialist tagup via VHF and telemetry monitoring, uses the Gamma-1 ECG equipment with biomed harness, skin electrodes and a blood pressure and rheoplethysmograph cuff wired to the cycle ergometer's instrumentation panels. For the graded exercise, the subject works the pedals after a prescribed program at load settings of 125, 150, and 175 watts for three minutes each. Data output involves a kinetocardiogram, rheoplethysmogram, rheoencephalogram and a temporal pulsogram.]*

After recharging the SONY HVR-Z1J digital high-definition camcorder's battery yesterday, Volkov and FE-2 Chamitoff set up the usual equipment to downlink Russian analog video signals from the RS (Russian Segment) via streaming video on US Ku-band, and checked it out with a network ping test. The A31p laptop was then turned off. Purpose of the video setup is to cover the Progress M-65/30P arrival on 9/12. *[The equipment involves the KL-211 MPEG-2 Encoder, the RSS1 A31p laptop (for monitoring the digital video) and a U.S. SSC (Station Support Computer) laptop (for converting the analog TV from Russian PAL mode to U.S. NTSC). Transmission tests with the ground followed (7:30am – 8:00am EDT), checking out connections and the digital video transmission over JSL/Ethernet plus OCA/Ku-Band to MCC-Houston and from there to Moscow via the ESA Gateway for COL-CC/Oberpfaffenhofen transmission to at TsUP-Moscow, plus transfer of the USOS analog video of the RS ISS video downlink via Streambox 2 to NISN (i.e., the Moscow Ostankino communication hub).]*

Chamitoff disconnected the thermal control MTL (Moderate Temperature Loop) supply jumper which he attached yesterday in the US Lab to an ITCS (Internal Thermal Control System) Z-panel (LAB1O3) for filling with coolant. *[The activity is in preparation for the installation of the WRS-1 (Water Recovery System 1) of the new Regenerative ECLSS in the CHeCS rack during STS-126/ULF2. CHeCS rack relocation is scheduled tomorrow (9/11). All coolant lines need to be filled prior to mating them to their respective racks.]*

Using the standard O-OHA (on-orbit hearing assessment) equipment, the FE-2 took the periodic auditory test which he had to postpone yesterday due to time constraints. The O-OHA test is a 30-min NASA environmental health systems examination to assess the efficacy of acoustic countermeasures, using a special MEC (Medical Equipment Computer) laptop application. It was Greg's third O-OHA session. Sergey & Oleg conducted their fourth sessions yesterday.

In the SM (Service Module), Volkov performed Part 4 of the scheduled R&R (removal & replacement) of the renewable condensate removal lines (SMOK) of the Russian SOTR Thermal Control System, today replacing the hoses between the SK1 valve behind panel 131 and a connector (K-G3) of the SRVK-2M condensate processor behind panel 436.

Gregory Chamitoff conducted his first session with the BCAT-3/4 (Binary Colloidal Alloy Test-3/4) science payload, setting up the MWA WSA (Maintenance Work Area/ Work Surface Area) for BCAT operations, then taking photographs of the BCAT-3 samples 1-6 (undisturbed for six months) and restowing the BCAT-3 sample module. Afterwards, BCAT-4 samples were photographed. Homogenization of three BCAT-4 samples (8,9,10) was added to Greg's discretionary "job jar" task list. *[The BCAT equipment includes a DCS760 digital still camera run by the AAL (Alternate Applications Laptop) converted yesterday from an SSC (Station Support Computer) A31p, with "legacy" EarthKAM software for automatically taking flash photography of the sample every two hours over the next several days, a Mini-MagLite, and a camcorder for historical video. BCAT science in micro-G is a unique opportunity to explore fundamental physics and simultaneously develop important future technology, such as computers operating on light, complex biomolecular pharmaceuticals, clean sources of geothermal power, and novel rocket engines for interplanetary travel. The experiment itself is simple and elegant: photographing samples of colloidal particles with a digital camera onboard the ISS. Colloids are tiny nanoscale spheres of Plexiglas a thousand times smaller than the width of a human hair (submicron radius) that are suspended in a fluid. They are ubiquitous (e.g., milk, smoke, and paint) and therefore interesting to study directly. Colloids are also small enough that they behave much like atoms and so can be used to model all sorts of phenomena*

because their size, shape, and interactions can be controlled.]

Oleg completed the periodic (about twice a month) replenishing of the Elektron's water supply for electrolysis, filling the KOV thermal loops' EDV container with purified water from CWC (Contingency Water Container, #1051, #1064) collected by the U.S. CCAA (Common Cabin Air Assembly) dehumidifier. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron micropump shutdown.]*

Sergey conducted the periodic checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the passageways SM PrK (Service Module Transfer Compartment) – RO (SM Working Compartment), PkhO (SM Transfer Tunnel) – RO, PkhO – DC1, PkhO – FGB PGO, FGB PGO – FGB GA, and FGB GA–Node-1.

The FE-2 ran the visual microbial (bacterial & fungal) "T+5 Day" analysis of microbiology air samples collected on 9/5 with the MAS (Microbial Air Sampler) from mid-module locations in the station, including the Kibo laboratory. Surface sampling with the SSK (Surface Sampling Kit) was not performed on 9/5 due to crew time constraints. *[MAS sampling is performed once every three months, taking bacterial and fungal air samples at each location, and there are two locations sampled in each module. The samples are analyzed after 5-days of incubation in four Petri dishes.]*

In the US Lab, Kononenko performed the regular controlled shut-down of the EHS VOA (Environmental Health System-Volatile Organic Analyzer), with the ground power-cycling its RPC-3 (Remote Power Controller 3) *[part of RPCM (RPC Module) LAD42B_A.]*

In the SM, Oleg completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Kononenko also took care of the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Additionally, the FE-1 completed the regular monthly & quarterly TVIS maintenance, inspecting the condition of harnesses, belt slats, corner bracket ropes, IRBAs

(Isolation Restorative Bungee Assemblies) and gyroscope wire ropes for any damage or defects, lubricating as required plus recording time & date values. *[Today's inspection included pulling the TVIS skirt back at the corners to verify that the stabilizer fasteners (two per corner) are still tight.]*

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (FE-2) and VELO bike with bungee cord load trainer (CDR/MO-5, FE-1/MO-5).

Later, Greg transferred the exercise data files to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Working off the Russian at-crew's-discretion task list, Oleg conducted the regular status check of the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (barley) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control $ppCO_2$ levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

At ~10:25am, Sergey & Oleg conducted a telephone conversation with Ekaterina Beloglazova, editor of Rossiysky Kosmos Magazine. *["How did the ATV undocking go? What did you monitor?"; "Tell us about your next month activities. What else do you have to do?"; "Fire drill – what is that?"]*

Tonight at ~6:15pm EDT, Gregory Chamitoff is scheduled for a CDE (Crew Discretionary Event) via S-band/audio & Ku-band/video.

Hurricane Ike Update: As of Tuesday afternoon (yesterday), JSC/MCC-Houston is at pre-storm preparedness Level 4. Hurricane Ike is beginning to strengthen over the central Gulf of Mexico, headed WNW, with a currently predicted landfall near Matagorda Bay on Friday night, then taking a sharp turn north which could bring it directly into Houston. Preparations are underway at JSC for activating the BCC (Backup Control Center) at MSFC/Huntsville and the BAT (Backup Advisory Team). *[JSC Threat Level 4: Initiated when a storm poses a threat to JSC within*

72 hrs or a storm enters the Gulf and threatens JSC. Level 3: Storm poses a threat to JSC within 48 hrs. All non-flight MCC-H personnel are suspended and outlying facilities are powered down. Transfer to BCC operations is imminent. Level 2: Storm poses a threat to JSC within 36 hrs. One string of nominal S-band telemetry, command, and voice communications are retained with the ISS from MSFC and TsUP-Moscow. HRT (Hurricane Ride-Out Team) performs fire watch within MCC-H throughout the storm. Level 1: Storm poses a threat at JSC within 24 hrs. BAT will be prime for command & control of the ISS/US Segment. If BAT is unable to provide recommendations, BCC Deployment Team will be contacted. Initiation of the individual threat levels have to be authorized by the JSC Director.]

Progress M-65/30P Update: At Baikonur/Kazakhstan, the Soyuz-U rocket with the Progress M-65/30P resupply/cargo vehicle stands poised on Pad 1 for today's launch. Propellant loading preparations began this morning at 8:00am, followed by the usual meeting of the State Board at 11:20am, to approve initiation of the tanking process, starting at 12:00pm. After launch at 3:50pm EDT, orbital insertion is at 3:58:47pm, followed later by two corrective burns (DV1/14.86 m/s at ~7:30pm; DV2/16.81 m/s at ~8:16pm) and a third burn tomorrow (DV3/2.00 m/s at ~4:34pm). Docking at the ISS/SM aft port is on 9/12 at ~5:01pm.

CEO (Crew Earth Observations) photo targets uplinked for today were **Antarctic Ice Pack, S. Indian Ocean** *(sea ice and icebergs are beginning to move northwards from Antarctica, and breaks in the cloud cover may have allowed for photography of the sea surface. Looking to the right of track for holes in the cloud deck south of Madagascar. Images of ice are useful, both for tracking the motion of icebergs that may present a danger to shipping, and for study of ice breakup processes),* and **Hurricane Ike, Gulf of Mexico** *(Hurricane Ike was in the Gulf of Mexico at the time of the ISS overpass, and is predicted to be at Category 2 strength. Looking to the left of track towards Cuba for the storm. This will likely have been Greg's last opportunity to photograph the storm before illumination conditions become unfavorable for photography).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 21 Scheduled Main Activities:

- Thu. (9/11): MBI-11; JAXA Art video; TORU OBT rvw; CHeCS Rack relocate; SOTR-SMOK R&R; CWC audit; IWIS reprog.
- Fri. (9/12): Tekh-20 (PK-3) BSPN; Lulin-5 check; ICS umbilical mate; Progress 30P docking (SM aft port); Node-2 cleanout; NUTRITION setup.
- Sat. (9/13): NUTRITION w/blood collect; Progress SSVP-StM docking

system dismantle; US-21 install; BITS2-12 connect; 30P cargo transfers (BTKh-1,-2,-3,-4,-20, SOLO-PCBA); BTKh-29 trans./install; IWIS dwnld; ham pass; FFQ.

ISS Orbit (as of this morning, 7:34am EDT [= epoch]):
Mean altitude -- 353.1 km
Apogee height -- 357.8 km
Perigee height -- 348.4 km
Period -- 91.60 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006982
Solar Beta Angle -- 39.5 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 40 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56195

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/10/08 -- Progress M-65/30P launch (~3:50pm)
09/12/08 -- Progress M-65/30P docking (SM aft, ~5:01pm)
09/29/08 -- ATV de-orbit (nighttime re-entry for observation from 2 NASA planes; 9:12pm)
10/01/08 -- **NASA 50 Years** (official)
10/10/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4) 12:33am
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) & landing
11/12/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/14/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)

04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/09/08
Date:	Tuesday, September 09, 2008 2:12:28 PM
Attachments:	

ISS On-Orbit Status 09/09/08

All ISS systems continue to function nominally, except those noted previously or below.

Upon wakeup, FE-2 Chamitoff started the next part (3rd of 5) of the periodic acoustic measurement protocol by recording post-sleep data of the crew-worn acoustic dosimeters, later deploying the dosimeters statically (Part 4), one at the SM (Service Module) Central Post, one in Node-2 and the third in an empty rack bay in the Kibo JPM (JEM Pressurized Module). Tonight (~3:10pm EDT), Chamitoff will record the data taken by the three static dosimeters during the day (Part 5). *[Acoustic data must be taken twice per Increment, each time for the duration of the 16-hour crew workday.]*

CDR Volkov serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out"-to-vacuum cycle on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~4:30pm EDT. Filter bed #1 was regenerated yesterday. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time: 9/3 & 9/4).]*

In preparation for Progress M-65/30P docking on 9/12 (Friday), CDR Volkov & FE-1 Kononenko completed the standard three-hour training course with the TORU teleoperator system, which provides a manual backup mode to the Progress' KURS automated rendezvous radar system. Afterwards, Sergey & Oleg tagged up with a TORU instructor at TsUP/Moscow via S-band audio. *[The drill included procedure review, rendezvous, docking data and rendezvous math modeling data review, fly-around, final approach, docking and off-nominal situations (e.g., video or comm loss). Three modes were simulated on the RSK1 laptop: two with 30P from stationkeeping range (~150 m) in sunlight (insolation), and 30P in final approach (from 50 m) in darkness (eclipse). The TORU teleoperator control system lets a SM-*

based crewmember perform the approach and docking of automated Progress vehicles in case of KURS failure. Receiving a video image of the approaching ISS, as seen from a Progress-mounted docking television camera ("Klest"), on a color monitor ("Simvol-Ts", i.e. "symbol center") which also displays an overlay of rendezvous data from the onboard digital computer, the CDR would steer the Progress to mechanical contact by means of two hand controllers, one for rotation (RUO), the other for translation (RUD), on adjustable armrests. The controller-generated commands are transmitted from the SM's TORU control panel to the Progress via VHF radio. In addition to the Simvol-Ts color monitor, range, range rate (approach velocity) and relative angular position data are displayed on the "Klest-M" video monitor (VKU) which starts picking up signals from Progress when it is still approximately 8 km away. TORU is monitored in real time from TsUP over Russian ground sites (RGS) and via Ku-band from Houston, but its control cannot be taken over from the ground. On 9/12, Progress KURS will be activated at ~3:27pm EDT on Daily Orbit 1 (DO1), SM KURS two minutes later. Progress headlight will be switched on at a range of ~8 km (~4:20pm). Flyaround to the SM aft docking port (~400 m range, in sunlight) starts at 4:37pm. Start of final approach: ~4:52 (DO1) in sunlight, contact: ~5:01pm (in darkness).]

In the Kibo laboratory, Gregory Chamitoff set up and conducted two of JAXA's fascinating EPO (Educational Payload Observation) activities,- AQUASPHERE and INK BALL, each one requiring about one hour. For the session, SSIPC (Space Station Integration & Promotion Center/Tsukuba) temporarily shut down the IMV (Intermodular Ventilation) and SDs (smoke detectors) in the JPM (Greg serving as living SD). Afterwards, the experiments were closed out and IMV & SDs turn on again. *[The Japanese EPO program consists of eight activities: Life in the Universe (study of space environment effects on living things for educational purpose); Space Poem Chain (poems by famous poets and general public composed & recorded before the launch on a DVD, played and stored on ISS); Microgravity Clay (sculpting in clay to express the inspiration of human space flight); Aquasphere (recording the motion of a water sphere after external oscillations in micro-G environment with an HDTV camera, making various water shapes by vibration); Ink Ball (creating ink flow patterns/"marbling" on the water sphere, then transferring the marbling from the water ball to handmade Japanese papers for recording); Art (images taken with the HDTV camera on the ISS); Space Clothes (studying new clothing designs in space); and Photographing the Moon (images taken of the Moon from the station).]*

After the FE-2 broke out the standard auditory test equipment, the three crewmembers took the periodic O-OHA (on-orbit hearing assessment) test, a 30-min. NASA environmental health systems examination to assess the efficacy of acoustic countermeasures, using a special MEC (Medical Equipment Computer) laptop application. It was Greg's third O-OHA session, the fourth for Sergey &

Oleg. *[The O-OHA audiography test involves minimum audibility measurements for each ear over a wide range of frequencies (0.25-10 kHz) and sound pressure levels, with the crewmembers using individual-specific Prophonics earphones, Bose ANC headsets and the SLM (sound level meter). To conduct the testing, the experimenter is supported by special EarQ software on the MEC, featuring an up/ down-arrow-operated slider for each test frequency that the crewmember moves to the lowest sound pressure level at which the tone can still be heard. The baseline test is required not later than about Flight Day 14 for each new Expedition and is then generally performed once per month. Note: There have been temporary hearing deficits documented on some U.S. and Russian crewmembers, all of which recovered to pre-mission levels.]*

Sergey Volkov performed Part 3 of the scheduled R&R (removal & replacement) of the renewable condensate removal lines (SMOK) of the Russian SOTR Thermal Control System in the SM, today replacing the hoses between the NOK-1 and NOK-2 condensate pumps.

Oleg Kononenko initiated recharging of the SONY HVR-Z1J high definition camcorder's battery.

Battery recharging was also on Chamitoff's schedule, who initiated the 85-day maintenance cycle on the first two EMU (Extravehicular Mobility Unit) batteries (#2072, #2067) in BCM3 (Battery Charger Module 3) and BCM4 in the US Airlock, to run till 9/12. Greg also checked BCM1 (which had exhibited a buzzing noise before and has never been used for charging since its launch on 1J), but found nothing wrong. *[The periodic battery maintenance consists of fully discharging and then recharging the storage units to prolong their useful life. After end of the maintenance cycle, Clay will restore the SSC laptop, which is used in DOS mode for the automated procedure, to nominal ops.]*

In preparation for installing, during STS-126/ULF2, the WRS-1 (Water Recovery System 1) of the new Regenerative ECLSS in the CHeCS rack, to be relocated on 9/11 (Thursday), the FE-2 filled the thermal control MTL (Internal Thermal Control System/Moderate Temperature Loop) supply jumper with coolant by connecting it to an ITCS (Internal Thermal Control System) Z-panel in the Lab (LAB1O3). *[All coolant lines need to be filled prior to mating them to their respective racks.]*

Kononenko took the periodic readings of potentially harmful atmospheric contaminants in the SM, using the CMS (Countermeasure System), a component of the SKDS GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, today using preprogrammed microchips to measure for Isopropanol ("rubbing alcohol", C_3H_8O), Methanol ("wood alcohol", CH_3OH) and Toluene (methylbenzene, C_7H_8).

In the COL (Columbus Orbital Laboratory), Gregory prepared the ESA FSL (Fluid Science Laboratory) facility, used for GEOFLOW, for the upcoming Progress docking acceleration/disturbance by ensuring a firm lock of the EC (Experiment Container) with the CEM-L (Central Experiment Module-Lower).

Greg had some time set aside to familiarize himself with BCAT-3/4 (Binary Colloidal Alloy Test-3/4) reference material from last year's session, in preparation of a new run scheduled to start tomorrow. *[BCAT-3/4 in micro-G is a unique opportunity to explore fundamental physics and simultaneously develop important future technology, such as computers operating on light, complex biomolecular pharmaceuticals, clean sources of geothermal power, and novel rocket engines for interplanetary travel. The experiment itself is simple and elegant: photographing samples of colloidal particles with a digital camera onboard the ISS. Colloids are tiny nanoscale spheres of Plexiglas a thousand times smaller than the width of a human hair (submicron radius) that are suspended in a fluid. They are ubiquitous (e.g., milk, smoke, and paint) and therefore interesting to study directly. Colloids are also small enough that they behave much like atoms and so can be used to model all sorts of phenomena because their size, shape, and interactions can be controlled.]*

Later, to prepare for tomorrow's BCAT science, Chamitoff set up an AAL (Alternate Applications Laptop) in the US Lab, by configuring a previous-loaded SSC (Station Support Computer) hard drive for use on the OpsLAN network with applications requiring older software & driver versions (specifically: to run the DCS760 digital cameras needed for BCAT). *[Any SSC could be used except for SSC-4 which is required to run IWIS (Internal Wireless Instrumentation System). The AAL hard drive swap will be reverted to nominal config on 9/12.]*

Oleg Kononenko performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The FE-1 also completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew had their periodic PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Greg at ~8:45am, Oleg at ~11:30am, Sergey at ~12:00pm EDT.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-1, FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR).

Later, Sergey transferred the exercise data files to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

The crew had some time set aside to review a "Readme" summary preparing them for the upcoming major software upgrades. *[Revisions will be R11 for the PCS (Portable Computer System) laptops, R7 for the CCS (Command & Control System) and GNC (Guidance, Navigation & Control) computers, and R3 for NCS (Node Control Software).]*

As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control ppCO_2 levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

At ~2:15pm EDT, Sergey, Oleg & Greg downlinked a 20-min. TV PAO message of greetings in English & Russian to TsUP/Moscow for replay at the 59th International Astronautical Congress (IAC), to be held 9/29-10/3 at Glasgow, Scotland, for the Russian delegation, consisting of A.N. Perminov, V.A. Lopota, and other representatives of Russia's space industry. *["The 17th ISS expedition crew would like to welcome the scientists, engineers and the heads of space industries from different countries participating in the 59th International Astronautical Congress. This year we celebrate the 10th anniversary of the launching of the International Space Station. The ISS is the greatest ever known successful international space project and the participants of the 59th International Astronautical Congress in Glasgow have been directly involved in it. Presently the elements of all the Partners are integrated into the ISS. The ISS Program is constantly expanding. Next year we will have six crew members on board. New modules, new vehicles and new crews will be arriving at the station. In the future we envisage new utilization programs up to 2020 and perhaps beyond. The ISS will become an international scientific test bed to verify procedures and technologies for the flights to the Moon and Mars…"]*

MT Translation: For today's return of the Mobile Transporter railcart from Worksite

7 (WS-7) to WS-4, using string-A IMCAs (Integrated Motor/Controller Assemblies) at 3:15pm-5:15pm, Russian thrusters will be inhibited for the period of 3:00pm-6:00pm EDT due to load constraints.

VolSci Preview: For next Sunday's Voluntary Science program, Gregory was offered only one option this time,-a 1:55-hr session with the SPHERE (Synchronized Position Hold, Engage, Reorient, Experimental Satellites) payload, to continue algorithm/software development..

Progress M-64/29P Obit: Last night at 5:34pm, after its ~4:40pm EDT deorbit burn, Progress M-64/29P splashed down in the designated area of the Pacific ocean after destructive reentry. The cargo ship had undocked from the ISS on 9/1 and conducted a series of "Plasma-Progress" experiments during its autonomous flight. The TSNIIMash-developed experiment studies the plasma density in the Progress external environment, generated by the operations of the Progress liquid-propellant thrusters and observed with the incoherent dissipation radar of the Russian Institute of Solar & Earth Physics at Irkutsk. Similar experiments were conducted during the Progress M-60/25P & Progress M-62/27P independent-flight phases.

CEO (Crew Earth Observations) photo targets uplinked for today were **Hurricane Ike, Western Cuba** *(Hurricane Ike is currently traversing Cuba, and is predicted to be slightly south of the western half of the island at the time of the ISS overpass. Looking to the right of track for the storm; while it has been weakened by its passage over Cuba, it was likely at Category 2 strength when Greg viewed it),* and **Lake Poopo, Bolivia** *(weather was predicted to be mostly clear over Lake Poopo and the nearby Salar de Uyuni (salt flat). ISS had a near-nadir pass over the lake; photography of the lake shoreline was requested in order to assess change in water levels).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 21 Scheduled Main Activities:

- Wed. (9/10): MBI-18; MBI-12 term/dwnld; "Life on ISS" video; RS Video/ MPEG-2 Ku-Band test; CGSE troubleshoot; SOTR-SMOK R&R; MAS microbial analyses (T+5); BCAT-3/-4; Progress 30P launch.
- Thu. (9/11): MBI-11; JAXA Art video; TORU OBT rvw; CHeCS Rack relocate; SOTR-SMOK R&R; CWC audit; IWIS reprog.
- Fri. (9/12): Tekh-20 (PK-3) BSPN; Lulin-5 check; ICS umbilical mate; Progress 30P docking (SM aft port); Node-2 cleanout; NUTRITION setup.

- Sat. (9/13): NUTRITION w/blood collect; Progress SSVP-StM docking system dismantle; US-21 install; BITS2-12 connect; 30P cargo transfers (BTKh-1,-2,-3,-4,-20, SOLO-PCBA); BTKh-29 trans./install; IWIS dwnld; ham pass; FFQ.

ISS Orbit (as of this morning, 8:43am EDT [= epoch]):
Mean altitude -- 353.1 km
Apogee height -- 357.9 km
Perigee height -- 348.4 km
Period -- 91.60 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007052
Solar Beta Angle -- 35.7 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 48 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56180

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/10/08 -- Progress M-65/30P launch (~3:50pm)
09/12/08 -- Progress M-65/30P docking (SM aft, ~5:01pm)
09/29/08 -- ATV de-orbit (nighttime re-entry for observation from 2 NASA planes; 9:12pm)
10/01/08 -- **NASA 50 Years** (official)
10/10/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4) 12:33am
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) & landing
11/12/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/14/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch

03/27/09 – Soyuz TMA-14/18S docking (DC1)
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05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
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05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/08/08
Date:	Monday, September 08, 2008 12:50:27 PM
Attachments:	

ISS On-Orbit Status 09/08/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 21 of Increment 17.* ***Congratulations, Greg, on your 100th day in space today!***

Before breakfast, FE-2 Chamitoff began Part 1 (of 5) of the periodic acoustic measurement protocol by deploying crew-worn acoustic dosimeters, to be carried for 24 hours (with a microphone on the shirt collar). (Last time done: 7/12-13). *[Tonight, after about 15 hours of measurements, dosimeter data will be downloaded and the hardware power-cycled for another data take after 8.5-hr. sleep, starting tonight. At that point, the crew will deploy the dosimeters statically in the station for the duration of the day, record measurements tomorrow noon and stow the instruments. Acoustic data must be taken twice per Increment, each time for the duration of the 16-hour crew workday.]*

CDR Volkov performed the periodic maintenance of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The process will be terminated at ~4:45pm EDT and Bed #2 regeneration performed tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently (last time: 9/3 & 9/4).]*

FE-1 Kononenko, with the CDR assisting as required, had ~6 hrs reserved for disassembling, removing, closing out and stowing the ATV PCE (Automated Transfer Vehicle/Proximity Communications Equipment, Russian: MBRL) hardware in the SM (Service Module), now no longer needed after "Jules Verne" departed last week. *[The main MBRL components are the space-to-space radio "monoblock" (PCE Z0000), the BUAP antenna switching control box (BUAP), and the ATV control panel (PU).]*

In the JAXA Kibo laboratory, the FE-2 activated the MMA (Microgravity Measurement Apparatus) and its laptop (MLT), by first powering up the MMA's NCU/RSU (Network Control Unit/Remote Sensor Unit) set from the Ryutai rack's UDC (Utility DC to DC Converter), then turning on both the NCU/RSU and MLT.

After reviewing uplinked POC DOUG (Portable Onboard Computers/Dynamic Onboard Ubiquitous Graphics) material for today's robotics activity, Volkov and Chamitoff operated the Canadian SSRMS (Space Station Remote Manipulator System) by maneuvering it to and grappling the ESP-3 (External Stowage Platform 3) at the zenith side of the P3 truss for a ground-controlled checkout of the EBCS (External Berthing Camera System). Later, the crew released the ESP-3 PDGF (Power & Data Grapple Fixture) and maneuvered the arm to the Stage park position.

CDR Volkov performed Part 2 of the scheduled removal & replacement of the renewable condensate removal lines (SMOK) of the Russian SOTR Thermal Control System in the SM, today replacing the hoses between the SKV-2 air conditioner's BTA heat exchanger-evaporator and the NOK-2 condensate pump.

After disconnecting a jumper (77-1), from the FSS (Fluid System Servicer) flow meter tube, Chamitoff torqued (tightened) the jumper's male QD (Quick Disconnect) to ensure continued secondary seal integrity.

In preparation for the upcoming rack relocations within the US Lab, Gregory performed functionality checks on low pressure QDs which need to be manipulated for the transfers. All QDs checked out nominal except for the ITCS (Internal Thermal Control, System) QDs for ER-5 (EXPRESS Rack 5) which still show leakage. ER-5 was transferred to the JAXA JPM on 8/26, (when the leakage was seen first) and remains unpowered and unconnected. *[If one or more of the QDs cannot be demated, thus preventing rack transfer, flight controllers will reconfigure the ITCS by depressurizing lines on the rack transfer day to allow QD removal, the goal being only to reconfigure the ITCS system once if possible. Depending on which QDs leak, this may or may not be possible.]*

The crew conducted the regular fire drill/OBT (on-board training), a mandatory periodic one-hour exercise (including ground debrief conference), deferred from 8/27 because of the DAM (Debris Avoidance Maneuver). *[Primary goal of this Russian-led interactive exercise is to provide the station residents with the most realistic emergency training possible. The drill is always conducted with the support of both MCCs in close coordination. It should be performed every 2.5 months, but not later than 1 month prior to end of Increment. OBT objectives are to (a) practice fire response procedures (FRPs) and all incorporated actions for the case of a software-detected fire to locate, extinguish, and verify extinguishing attempts; (b)*

browse through RS laptop and the Signal-VM fire detection system displays as well as the automated software (algorithms) response to the fire event; (c) practice crew communication necessary to perform emergency FRPs; (d) ensure familiarization with support equipment (CSA-CP compound specific analyzer-combustion products, PBAs portable breathing assemblies, PFE/OSP-4 portable fire extinguishers, and IPK-1M gas masks to be used for fire suppression. These exercises do not actually use any fire equipment but simulate such actions to the maximum extent possible. The Emergency Procedures OBT concluded with a 15-min. debrief with Russian/U.S. ground specialists at ~12:00pm EDT via S-band.]

Gregory conducted the periodic hatch seal inspection in all USOS (US segment), ESA & JAXA modules (Node-1 Forward, Aft & Starboard, Airlock, Lab Aft & Forward, Node-2 Aft, Starboard & Port, Columbus, Kibo JPM Starboard & Zenith, Kibo JLP Nadir) in support of ACS (Atmospheric Control System) maintenance, using a special vacuum cleaner and other tools (last time done: 7/8).

The FE-2 continued the JAXA CGSE (Common Gas Supply Equipment) CO_2 leak troubleshooting in the JPM (JEM Pressurized Module) begun last week, today preparing the Saibo rack with the CGSE for the planned leak check (which, as per JAXA report this morning, is still showing pressure decay on the CO_2 line).

[Preparations focused on isolating the SAIBO rack from the system CO_2 line by disconnecting the QD (Quick Disconnect) on the UIP (Utility Interface Panel/Z-Panel) and repressurizing the system CO_2 line, to be then monitored by SSIPC (Space Station Integration & Promotion Center) at Tsukuba/Japan for two days to determine if either the system or the payload is the CO_2 leak source. Background: On 8/8, the CBEF (Cell Biology Experiment Facility) in the SAIBO rack exhibited a sudden unexpected pressure drop at the CGSE CO_2 high-pressure sensor, from 3000 kPa to 500 kPa within 1.5 minutes. Specialists believe that the SSV (Self Shut-off Valve) closed itself unexpectedly, making it a potential contributor to the sudden pressure decrease. Also suspected is leakage from the CO_2 supply line.]

Chamitoff also conducted another one of the periodic offloadings of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1070) with the collected water slated for processing. No samples were required. *[Estimated offload time before reaching the tank's neutral point (leaving ~6 kg in the tank): ~30 min.]*

For Sergey Volkov, it was time again for recharging the Motorola Iridium-9505A satellite phone brought up on Soyuz 16S, a monthly routine job and his fifth time. *[After retrieving it from its location in the TMA-12/16S descent module (BO),*

Sergey initiated the recharge of its lithium-ion battery, monitoring the process every 10-15 minutes as it took place. Upon completion at ~3:00pm, the phone was to be returned inside its SSSP Iridium kit and stowed back in the BO's operational data files (ODF) container. The satphone accompanies returning ISS crews on Soyuz reentry & landing for contingency communications with SAR (Search-and-Rescue) personnel after touchdown (e.g., after an "undershoot" ballistic reentry, as happened during the recent 15S return). The Russian-developed procedure for the monthly recharging has been approved jointly by safety officials. During the procedure, the phone is left in its fire-protective fluoroplastic bag with open flap. The Iridium 9505A satphone uses the Iridium constellation of low-Earth orbit satellites to relay the landed Soyuz capsule's GPS (Global Positioning System) coordinates to helicopter-borne recovery crews. The older Iridium-9505 phones were first put onboard Soyuz in August 2003. The newer 9505A phone, currently in use, delivers 30 hours of standby time and three hours of talk, up from 20 and two hours, respectively, on the older units.]

Working off the Russian at-crew's-discretion task list, Oleg Kononenko performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Also from the task list, the FE-1 completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

As third "time permitting" task list job, Oleg conducted the regular status check of the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (barley) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

Later, Sergey transferred the exercise data files to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control $ppCO_2$ levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS (Internal Thermal Control System) cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

No CEO (Crew Earth Observation) photo targets uplinked for today.

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Week 21 Scheduled Main Activities:

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- Wed. (9/10): SLEEP; MBI-18; MBI-12 term/dwnld; "Life on ISS" video; RS Video/MPEG-2 Ku-Band test; CGSE troubleshoot; SOTR-SMOK R&R; MAS microbial analyses (T+5); BCAT-3/-4; Progress 30P launch.
- Thu. (9/11): MBI-11; JAXA Art video; TORU OBT rvw; CHeCS Rack relocate; SOTR-SMOK R&R; CWC audit; IWIS reprog.
- Fri. (9/12): Tekh-20 (PK-3) BSPN; Lulin-5 check; ICS umbilical mate; Progress 30P docking (SM aft port); Node-2 cleanout; NUTRITION setup.
- Sat. (9/13): NUTRITION w/blood collect; Progress 30P SSVP-StM docking system dismantle; US-21 install; BITS2-12 connect; 30P cargo transfers (BTKh-1,-2,-3,-4,-20, SOLO-PCBA); BTKh-29 trans./install; IWIS dwnld; ham pass; FFQ.

ISS Orbit (as of this morning, 8:17am EDT [= epoch]):
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Apogee height -- 357.9 km
Perigee height -- 348.5 km
Period -- 91.60 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006424
Solar Beta Angle -- 31.6 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 20 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56164

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

09/08/08 -- Progress M-64/29P de-orbit (~4:47pm)
09/10/08 -- Progress M-65/30P launch (~3:50pm)
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10/01/08 -- **NASA 50 Years** (official)
10/10/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4) 12:33am
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) or 10/24?
11/12/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/14/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/07/08
Date:	Sunday, September 07, 2008 12:27:52 PM
Attachments:	

ISS On-Orbit Status 09/07/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – rest day for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff. Ahead: Week 21 of Increment 17.*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the SM (Service Module) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

As part of the house cleaning, the crew conducted regular maintenance inspection & cleaning on fan grilles in the FGB (TsV1), SM (VPkhO, VPrK, FS5, FS6 & FS9), DC1 (V3) screens, as well as in the COL (Columbus Orbital Laboratory).

Sergey Volkov performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. The CDR today also checked up on the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem, gathering weekly data on total operating time & "On" durations for reporting to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

In preparation for tomorrow's Robotics activities, Chamitoff set up the SSRMS (Space Station Remote Manipulator System) video camera connection by hooking up the UOP DCP (Utility Outlet Panel/Display & Control Panel) power bypass cable

at the CUP RWS (Cupola Robotic Work Station). *[Tomorrow's SSRMS operations require a maneuver & grapple to the ESP-3 (External Stowage Platform 3) by Chamitoff for an EBCS (External Berthing Camera System) checkout by the ground.]*

The station residents conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control ppCO_2 levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS (Internal Thermal Control System) cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

Working off their discretionary "as time permits" task list, Sergey and Oleg ran another session with the Russian biomedical MBI-15 "Pilot-M"/NEURO signal response experiment, with Kononenko today's subject and Volkov assisting. Afterwards, the Pilot-M & Neurolab-2000M gear was torn down and stowed. *[MBI-15 requires a table, ankle restraint system, eyeball electrodes for an EOG (electrooculogram), and two hand controllers (RUO & RUD) for testing piloting skill in "flying" simulations on a laptop (RSK1) under stopwatch control, as well as for studying special features of the psychophysiologic response of cosmonauts to the effects of stress factors in flight.]*

Also from the discretionary task list, Oleg conducted the regular status check of the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (barley) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

A third item on the Russian "job jar" list for the FE-1 was another run of the Russian DZZ-2 "Diatomeya" ocean observations program, using the NIKON-F5 DCS still camera with f85mm lens and the HDV camcorder from SM window #7 to record color field patterns in the target water areas and current cloud cover conditions above them. September is the time to observe the autumnal peak in development of phytoplankton at mid-latitudes associated with higher concentration of biogenic matter in the ocean due to its regeneration and continental runoff. *[Uplinked target zones in the Indian Ocean were the coastal area of South Africa and the area south-west of Australia, and in the Atlantic Ocean the US coastline and the area south of*

Africa.]

WiFi Switch Update: Congrats went up to the crew on yesterday's successful verification of the station's switch to WiFi: "It's very good to know that the new WAPs (Wireless Access Points) work so well—even reaching an unexpected location. How convenient!" *[When the ground could not connect to the WiFi-card equipped SSC-11 (Station Support Computer 11) A31p laptop to set up the wireless network with the appropriate "wizard", Chamitoff configured SSC-9 locally with a different WiFi card, and that fixed the problem, although the actual cause (card or transition difference) remains unclear. SSC-9 was later returned to normal OpsLAN ops.]*

No CEO (Crew Earth Observation) photo targets uplinked for today.

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- Tue. (9/9): SLEEP; Acoustic Survey; BMP ch.2 regen; TORU OBT; O-OHA; EMU batt. maint.; BCAT-3 fam.; PMCs; JAXA AQUA-Ink Ball exp.; MBI-12.
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09/12/08 -- Progress M-65/30P docking (SM aft, ~5:01pm)
09/29/08 -- ATV de-orbit (nighttime re-entry for observation from 2 NASA planes; 9:12pm)
10/01/08 -- **NASA 50 Years** (official)
10/10/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4) 12:33am ***[new target date]***
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) or 10/24?
11/12/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC ***[new target date]***
11/14/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/06/08
Date:	Saturday, September 06, 2008 1:45:00 PM
Attachments:	

ISS On-Orbit Status 09/06/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – off duty day for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff.*

ATV Adieu: At 5:31pm EDT last evcening, ATV1 (Automated Transfer Vehicle 1) "Jules Verne" successfully undocked from the ISS Service Module (SM) aft port, with Sergei Volkov and Oleg Kononenko standing by to monitor separation maneuvers and telemetry parameters. As planned, Kononenko recorded imagery of the ATV front cone during departure. As ATV2 is being assembled at Bremen/ Germany, ATV1 performed nominal separation burns and is scheduled for re-entry on 9/29 at night time, to be observed from two high-flying NASA planes.

Due to the late-afternoon ATV undocking, the crew's sleeptime last night began 1.5 hours later than usual (7:00pm). Wake-up this morning was slipped to 3:30am. Tonight the cycle moves back to normal (5:30pm-2:00am EDT).

At ~9:45am, the crewmembers conducted their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-Houston and TsUP-Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

CDR Volkov downloaded the structural dynamics data collected by the IWIS NCU/ RSUs (Internal Wireless Instrumentation System/Network Control Unit/Remote Sensor Units) last evening during the ATV undocking, for subsequent downlink via OCA. Later, Sergey deactivated the IWIS.

In the JAXA Kibo laboratory, FE-2 Chamitoff likewise powered off the MMA (Microgravity Measurement Apparatus) NCU/RSU at the Ryutai rack UDC (Utility DC-to-DC Converter) unit.

After transitioning the JSL (Joint Station LAN) network to the new Netgear wireless APs (Access Points, WAPs) which provide the ISS with WiFi (wireless+Ethernet) connectivity, Gregory today repeated functionality tests, abandoned earlier this week, in three Kibo JPM (JEM Pressurized Module) locations from the wireless SSC -11 laptop, and later also in the COL (Columbus Orbital Laboratory). Afterwards switching to “Proxim” APs, the new WiFi “Dolphin” BCRs (Barcode Readers) were also tested.

In the following 3-hr. VolSci (Voluntary Weekend Science) session, Chamitoff focused again on SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellites), performing algorithm/software development for the experiment as a stand-alone activity, i.e., with no ground support required from PD (Payload Developer) or POIC (Payload Operations & Integration Center/Huntsville) personnel.

Kononenko conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Working off their discretionary “as time permits” task list, Sergey and Oleg ran another session with the Russian biomedical MBI-15 "Pilot-M"/NEURO signal response experiment, with Volkov today’s subject and Kononenko assisting. Afterwards, the Pilot-M & Neurolab-2000M gear was left connected for the upcoming run for Oleg. *[MBI-15 requires a table, ankle restraint system, eyeball electrodes for an EOG (electrooculogram), and two hand controllers (RUO & RUD) for testing piloting skill in “flying” simulations on a laptop (RSK1) under stopwatch control, as well as for studying special features of the psychophysiologic response of cosmonauts to the effects of stress factors in flight.]*

The station residents conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

Later, Gregory transferred the exercise data files to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

SSK Update: After collecting the scheduled microbiological air samples with the

MAS (Microbial Air Sampler) kit yesterday, microbiological surface sampling with the SSK (Surface Sampling Kit), also scheduled, had to be deferred due to crew time constraints.

S1 Radiator Cover Sheet Debonding Update: Imagery confirms that a face sheet has peeled back on one panel (#7) of the S1 TRRJ (Thermal Radiator Rotary Joint) Radiator 3, for currently unknown reasons. Teams are looking for any changes and/or movement of the face sheet since the damage was discovered on 9/4. Forward plans to assess the root cause are being worked. Current heat rejection requirements are far below the ETCS (External Thermal Control System) heat rejection capability; therefore no operational impacts have been identified from a heat rejection standpoint. *[Each of the eight radiator panels has two thermal face sheets, one on each side, which are epoxy-glued and autoclaved to the honeycomb structure of the radiator. The face sheets have a thermal surface coating designed to maximize heat reflection & absorption transfer to space. Further investigation is underway, and specialists are currently keeping a camera on the panel for monitoring.]*

Conjunction Update: When a conjunction prediction last night (8:00pm EDT) for a piece of Kosmos 2421 debris showed a miss distance of 0.67 km at a TCA (Time of Closest Approach) of ~10:00am this morning, leaving insufficient time for calculating & executing a DAM (Debris Avoidance Maneuver) with SM propulsion, Safe Haven instructions were uplinked to the crew. Subsequent tracking data reduced the PC (Probability of Collision) drastically, and when it approached zero this morning, "Safe Haven" was called off. *[For the Safe Haven scenario, the crew would have relocated the Airlock PCS (Portable Computer System) laptop to the SM, then closed out and egressed the two Kibo modules (JLP, JPM), COL, Node-2, US Lab, Node-1/PMA-1, closing all hatches to the RS (Russian Segment), which contains ECLSS, and then retreating to the Soyuz crew return vehicle to await TCA.]*

Weekly Science Update *(Expedition Seventeen -- Week 20)*

3-D SPACE: In progress.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Measurements continue in FGB module.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-2/CGBA-5 (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus 5): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): Due to safety concerns identified for the PLEGPAY instrument (when operated in Plasma Discharge mode), the entire EuTEF platform was put in survival mode on 9/1 at around 11:00am EDT (just prior to 29P undocking). Since then, the EuTEF power feeder#1 has been de-activated and no science acquisition is possible. Teams on the ground are closely monitoring the situation and assessing science impacts. EuTEF will be unable to stay in this situation for a long period of time. -- DEBIE-2: Inactive; -- DOSTEL: Inactive; -- EuTEMP: Inactive; -- EVC: Inactive; -- EXPOSE: Inactive; -- FIPEX: Inactive; -- MEDET: Inactive; -- PLEGPAY: Inactive; -- TRIBOLAB: Inactive.

FSL (Fluid Science Laboratory): FSL is nominal.

GEOFLOW: On 8/27, the Science Run#4 was interrupted in order to prepare the FSL Facility for the DAM (Debris Avoidance Maneuver) which took place on that day. GEOFLOW Science Run#1 to Run#4 data have been successfully downlinked and handed over to the science team in Germany. We have gotten very promising results for GEOFLOW so far! The FSL Facility Core Element (FCE) was locked on 8/27 and remains locked for the ISS vehicle traffic (29P undock, ATV undock, 30P docking). The FSL FCE will remain locked at least until after the Progress 30P docking planned on 9/12.

HDTV System Test DL (JAXA): The G1 camcorder function check using MPC was partially conducted on 9/05. Since the Earth view from JPM windows was not able to be performed, it will be rescheduled.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Planned.

Marangoni Experiment for ISS (JAXA Fluid Physics Experiment Facility): The second Marangoni experiment cycle is in progress and will be completed on 9/07.

Micro-G Clay (JAXA EPO): The Clay figures were retrieved from the JPM wall on 8/28 and stowed for return on ULF2.

MISSE (Materials ISS Experiment): Ongoing.

Moon Photography from ISS (JAXA EPO): Complete.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-1/-2 (Nitric Oxide Analyzer, ESA): Complete.

NUTRITION w/REPOSITORY: In progress.

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PCRF (Protein Crystallization Research Facility) Reconfiguration (JAXA): The PCRF reconfiguration was completed nominally on 8/28.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): *"*Greg, you have almost completed all of the planned test points for SHERE. We thank you very much for all the fantastic science you have given us and all your hard work. You have given us science far beyond the original plan, and your results have sparked much discussion and excitement among the team. Thank you! We will send you more results as we analyze the data, and we hope to work with you again soon."

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): "Greg, thanks for completing your Actiwatch download activity. Your data continues to look great. To avoid the no communication error you got, the stowage notes for the next Sleep activity will direct you to another Actiwatch Reader whose battery power functionality has been verified."

SOLAR (Solar Monitoring Observatory): The current Sun visibility window opened on 8/25, but unfortunately due to high values of ISS Yaw, Pitch and Roll, it was not possible to track the Sun before 8/28. The science acquisition is currently taking place without any problems. SOLAR performed two crisscross measurements on 8/29 and on 9/01. The present Sun observation window should normally close on 9/06.-- SOVIM: continuously acquiring science; -- SOLSPEC: acquiring science, daily calibration and Sun spectrum measurements; -- SOLACES: acquiring science, regular command scripts performed.

SOLO: Planned.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): "Greg, thanks for supporting SPHERES for Voluntary Science. Test #12 went well!"

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): Teams on the ground continue to assess the results of the BIOLAB Rotor A Bellow

Test, which gave faulty signals for 4 out of 6 Reference ECs (Experiment Containers). The next troubleshooting step is currently planned on 9/5 with the Rotor B Actuator test and Rotor B bellow test, all performed from ground.

CEO (Crew Earth Observations): Through 9/04 the ground has received a total of 5,796 frames of CEO images for review and cataloging. "Photos acquired with times corresponding to our CEO target list request times are reviewed first and this week included: Santorini Volcanic Complex, Greece (acquired and under review); Kwanza Basin Angola (under review-more clouds and smoke than we expected); Hurricane Gustav (acquired, confirmed, and published by PAO); High Central Andean Glaciers (some acquired-under review); Cairo Egypt (not acquired); Yellowstone National Park (useful imagery acquired-under review); and Hurricane Ike (acquired, confirmed, and published by PAO). A good week's work! Thank you for the prompt downlink of dynamic events like hurricanes. Your dazzling high-oblique view, through breaks in the clouds, of the middle Amazon River basin will be published on NASA/GSFC's Earth Observatory Site this weekend. Sun glint-enhanced water features provide rare visual insight into the structures and processes of this great river system. Good eye!"

CEO photo targets uplinked for today were **Hurricane Ike, Atlantic Ocean** *(Dynamic Event. Hurricane Ike remains a well-formed storm. It has weakened slightly, but is predicted to regain strength as it continues westwards towards the Bahamas. Looking to the right of track for the storm),* **Red River Basin, TX** *(the Red River basin along the Texas/Oklahoma border is the focus of ongoing development, providing an opportunity to track land use/land cover change over time. Overlapping nadir frames - taken along track as ISS approached, crossed, and then departed the river channel almost directly to the north of the Dallas/Forth Worth, TX metro area - were requested),* and **Jarvis Island, equatorial Pacific** *(weather is predicted to be clear over Jarvis Island, providing an opportunity for high resolution imagery of the island and surrounding coral reefs. Greg had a nadir pass over the island. Images of the island are useful for mapping shoreline geomorphology and reef extent over time).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 21 Scheduled Main Activities:

- Sun. (9/7): Station cleaning; DCP video bypass cable install for Robotics; PFC (FE-2).
- Mon. (9/8): SLEEP; Acoustic Survey; BMP ch.1 regen; POC-DOUG revw; SSRMS/ESP-3; Hatch seal inspect; CGSE troubleshoot; EMER OBT; ATV MBRL/PCE uninstall; Iridium phone recharge.

- Tue. (9/9): SLEEP; Acoustic Survey; BMP ch.2 regen; TORU OBT; O-OHA; EMU batt. maint.; BCAT-3 fam.; PMCs; JAXA AQUA-Ink Ball exp.; MBI-12.
- Wed. (9/10): SLEEP; MBI-18; MBI-12 term/dwnld; "Life on ISS" video; RS Video/MPEG-2 Ku-Band test; CGSE troubleshoot; SOTR-SMOK R&R; SSK/ MAS T+5 analyses; BCAT-3/-4.

ISS Orbit (as of this morning, 8:57am EDT [= epoch]):
Mean altitude -- 353.2 km
Apogee height -- 357.9 km
Perigee height -- 348.6 km
Period -- 91.60 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006956
Solar Beta Angle -- 23.0 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 89 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56133

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/08/08 -- Progress M-64/29P de-orbit (~4:45pm)
09/10/08 -- Progress M-65/30P launch (~3:49:45pm)
09/12/08 -- Progress M-65/30P docking (SM aft, ~5:08pm DM)
09/29/08 -- ATV de-orbit (nighttime re-entry for observation from 2 NASA planes; 9:12pm)
10/01/08 -- **NASA 50 Years** (official)
10/10/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4) 12:33am
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
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11/14/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
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11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment

02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/05/08
Date:	Friday, September 05, 2008 2:33:57 PM
Attachments:	

ISS On-Orbit Status 09/05/08

All ISS systems continue to function nominally, except those noted previously or below.

Sleep Cycle Shift: Due to the late-afternoon ATV (Automated Transfer Vehicle) undocking, the crew's sleep cycle shifted by 1.5 hrs: wake-up this morning was at 3:30am EDT, sleeptime begins tonight at 7:00pm. Wake-up tomorrow will also be at 3:30am, and the cycle then moves back to normal.

CDR Volkov started out on the first part of the scheduled replacement of the renewable condensate removal lines (SMOK) of the Russian SOTR Thermal Control System in the Service Module (SM), first verifying shutdown of the two condensate pumps (NOK-1 & NOK-2), then purging the SMOK hoses with air and installing the first set of them between the BTA heat exchanger-evaporator of the SKV-1 air conditioner and the NOK-1 pump.

Continuing the current anti-virus campaign of "cleaning" and reloading RS (Russian Segment) crew support laptops, flash memory cards and DVDs with new antivirus software, FE-1 Kononenko downlinked the results of yesterday's RSS-1 & RSE-med laptop scans to the ground via Regul BRI/Smart Switch Router telemetry channel.

In the JAXA Kibo laboratory, FE-2 Chamitoff worked on the CBEF (Cell Biology Experiment Facility) to troubleshoot the malfunctioning door lock of the incubator and to take digital photos of three indicated locations (total of ~9 photos). *[CBEF provides an incubation environment with controlled temperature, humidity and carbon dioxide (CO_2) level. CBEF also has a centrifuge chamber for generating "artificial gravity", thus enabling simultaneous experiments under both micro-G and controlled-G conditions.]*

After starting to troubleshoot the CGSE (Common Gas Supply Equipment) CO_2

leak in the Kibo JPM (JEM Pressurized Module) on 9/3, Gregory Chamitoff today was to wrap up Part 1 of the investigation and prepare the systems for the scheduled leak check which is to track down the source of the still unexplained CO_2 loss. *[Activities included isolating the Saibo rack from the system CO_2 line by disconnecting the QD (Quick Disconnect) on the UIP (Utility Interface Panel/Z-Panel), then repressurizing the system CO_2 line from the upper CGSE GBU (Gas Bottle Units), to be monitored by SSIPC (Space Station Integration & Promotion Center) at Tsukuba/Japan for two days to determine if either the system or the payload is the CO_2 leak source. Background: On 8/8, the CBEF in the Saibo rack exhibited a sudden unexpected pressure drop at the CGSE CO_2 high-pressure sensor, from 3000 kPa to 500 kPa within 1.5 minutes. Specialists believe that the SSV closed itself unexpectedly, making it a potential contributor to the sudden pressure decrease. Also suspected is leakage from the CO_2 supply line. Next steps of the troubleshooting will depend on the result of the two-day leak check.]*

For a scheduled checkout of the G1 video camcorder with MPC (Multipurpose Converter) and IPU (Image Processing Unit), set up in the Kibo JPM yesterday, Chamitoff configured the camcorder for playing back some recorded test scenes, then downlinked the data (camcorder footage plus file transfer from the MLT/ Terminal Laptop) through the MPC and IPU. *[The MPC is part of the video equipment used for HDTV (High Definition TV) playback & downlink. While MPC has already been in general use in the Lab, this was the first MPC operation in Kibo, using JAXA-developed DC power supply, cables and a camera arm that are not used in the Lab. The IPU in the JPM's Ryutai rack can receive analog signals from the G1, and today's downlink of G1 data via IPU was to verify the integrity of both the G1 camcorder and IPU.]*

Oleg Kononenko had two hours set aside to conduct the periodic audit/inventory of RODF (Russian Operations Data File) procedures material. *[Going by an uplinked listing of ~48 ODFs, the audit was to verify whether RS procedures (Cue Cards) tabulated in the uplink are still available onboard, record the actual stowage location of them, take note of any discrepancies in their locations, ODF designations and number of copies, assess ODF conditions, and discard any ODF cue cards not listed in the uplink.]*

Later, the FE-1 went about taking the periodic readings of potentially harmful atmospheric contaminants in the SM, using the CMS (Countermeasure System). *[The CMS, a component of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, uses preprogrammed microchips to measure, normally, H_2CO (Formaldehyde, methanal), CO (Carbon Monoxide) and NH_3 (Ammonia), taking one*

measurement per microchip.]

Oleg also conducted the periodic checkout/verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the passageways SM PrK (Transfer Compartment)–SM RO (Working Compartment), SM PkhO (Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1, and skipping the Soyuz hatch today.

Greg used the MAS (Microbial Air Sampler) kit to obtain periodic microbiology air samples from ISS modules (mid-module locations), including the Kibo laboratory. *[MAS sampling is performed once every three months, taking bacterial and fungal air samples at each location, and there are two locations sampled in each module. The samples are analyzed after 5-days of incubation in four Petri dishes.]*

The FE-2 also collected microbiological surface samples with the SSK (Surface Sample Kit) in the SM, Node-1 (at the location where the crew dries their clothing) and Lab. *[As for MAS, bacterial and fungal air samples are usually taken at two locations in the module being checked. The samples are analyzed after 5-days of incubation. For onboard visual analysis of media slides, the crew has a procedure for visual inspection of samples for bacterial and fungal colony growths after appropriate incubation periods.]*

Chamitoff performed another standard sensor calibration on the new CSA-O_2 (Compound Specific Analyzer-Oxygen) units #1043 & #1059, delivered on 1J.

Continuing the current round of periodic preventive maintenance of RS ventilation systems, Kononenko worked in the DC1 (Docking Compartment), replacing the PF1 & PF2 filter cartridges and cleaning the V1 & V2 fan grilles and VD1 & VD2 air ducts.

As next step in transitioning the JSL (Joint Station LAN) network to the new Netgear wireless APs (Access Points, WAPs) which provide the JSL with Ethernet connectivity, Gregory powered off the RF (radio frequency) LAN “Proxim” AP in Node-1 & Node-2, then inserted a new wireless network card into the SSC-11 (Station Support Computer 11) laptop, in support of a subsequent remote wireless checkout by the ground.

Sergey Volkov conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Oleg Kononenko completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

In the U.S. Lab, Volkov performed another controlled shut-down of the EHS VOA (Environmental Health System-Volatile Organic Analyzer), with the ground power-cycling its RPC (Remote Power Controller).

In preparation for tonight’s ATV undocking, Chamitoff closed the protective shutters of the science window in the JAXA JPM and in the U.S. Lab.

Later today, CDR Volkov & FE-1 Kononenko will be supporting the undocking and separation of “Jules Verne” by –

- Setting up and activating the KL-152 “Klest” television equipment in the SM with the ATV TV control console (BRTK-PU) *[with Ku-band downlink via OCA of the MPEG-2 (Moving Pictures Expert Group 2) “streaming video” packets, which MCC-Houston will then pass on to the ESA Gateway for COL-CC (Columbus Control Center) to forward the downlink to TsUP-Moscow; but NASA-TV will not be covering the undocking]*,
- Preparing the PCE (Proximity Communications Equipment) gear for the undocking, supported by ground specialist tagup via S-band (~3:55pm),
- Taking video and photography of the ATV forward cone at separation (~5:32pm), i.e., focusing the Nikon D2X still camera especially on the two TGM (Telegoniometer) sensor boxes and two VDM (Videometer) sensor boxes in front,
- Monitoring the fly-away from an SM window for situational awareness and safety,
- On TsUP Go, switching the PrK-to-aft port vestibule PEV (Pressure Equalization Valve, KVD) manually to its Closed position, and
- Observing proximity operations of the ATV from any aft window as “Jules Verne” ventures out on its independent flight phase.

At ~5:30am EDT, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU/*Glavnaya operativnaya gruppa upravleniya* = *“Chief Operative Control Group”*), including Shift Flight Director (SRP), at TsUP-Moscow via S-band/audio, phone-patched from Houston and Moscow.

At ~9:55am, Sergey & Oleg linked up with TsUP stowage specialists via S-band to conduct the weekly IMS tagup, discussing inventory & stowage issues, equipment locations and cargo transfers.

The station residents conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), and RED resistive exercise device (FE-2).

Later, Volkov transferred the exercise data files to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Working from the Russian discretionary “time permitting” task list, Oleg performed the regular status check on the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

S1 Radiator Cover Sheet Debonding: Imagery shows that a face sheet has peeled back on one panel of the S1 radiator, for currently unknown reasons. The heat rejection capability of the radiator has not been impacted to any significant extent, and the debonding of the face sheet is no issue for ATV undocking. *[Each of the eight radiator panels has two thermal face sheets, one on each side, which are epoxy-glued and autoclaved to the honeycomb structure of the radiator. The face sheets have a thermal surface coating designed to maximize heat reflection & absorption transfer to space. Further investigation is underway, and specialists are currently keeping a camera on the panel for monitoring.]*

WRM Update: An updated WRM (Water Recovery Management) “cue card” was uplinked overnight for the crew’s reference, updated with yesterday’s water audit. *[The new card (17-0002Y) lists 30 CWCs (~1095.0 L total) for the four types of water identified on board: technical water (362.3 L, for flushing only because of* Wautersia *bacteria), potable water (706.7 L, incl. 174.6 L currently on hold), condensate water (9 L), waste/EMU dump and other (17 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

ATV “Jules Verne” Undocking: Tonight, the ATV cargo ship, carrying ~900 kg (2,000 lbs) of dry waste and 254 kg (560 pounds) of liquid waste, will undock from the ISS SM aft port, according to the following summary flight plan:

- ISS mnvr to undocking attitude 3:10pm EDT
- ISS Free Drift 5:27pm
- Sunrise 5:27:36pm
- Undock Command 5:28pm
- Phys.Sep/hooks open (spring delta-V≈0.08m/s) **5:31pm**

- ATV departure burn (316 s, delta-V≈4.00 m/s) 5:32pm
- ISS mnvr to TEA attitude 5:55pm
- Sunset 6:24pm
- *Independent flight until deorbit on 9/29 (Monday):*
- Deorbit Burn #1 (29.80 m/s) 6:14:39am
- Deorbit Burn #2 (70.28 m/s) 9:12:27am

CEO (Crew Earth Observations) photo targets uplinked for today were **Hurricane Ike, Atlantic Ocean** *(Dynamic Event. Hurricane Ike is now a strong Category 3 storm, and exhibits well-defined outflow banding and an eye feature. Greg was to look to the right of track for the hurricane. Current track predictions have Ike encountering the Bahamas by early next week),* **Madrean Sky Islands, SW USA/ Mexico** *(the Madrean Sky Islands are patches of forest near the summits of the high mountains of the southwestern USA and northwestern Mexico. These forests are remnants of much more extensive vegetation that once existed at lower elevations in cooler and wetter climates. Looking to the W as ISS passed over New Mexico and northern Mexico for views of the mountains. Oblique images of the mountains were requested to provide context for later high-resolution imagery),* and **Pilcomayo River dynamics, Northern Argentina** *(the Pilcomayo River rises in the Andes Mountains to the west. Images of the river course and adjacent floodplains – located to the right of track - were requested for investigation of river dynamics and land cover change near the banks)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 20/21 Scheduled Main Activities:

- Sat. (9/6): FFQ; IWIS deactivation.
- Sun. (9/7): Station cleaning; DCP video bypass cable install for Robotics; PFC (FE-2).
- Mon. (9/8): SLEEP; Acoustic Survey; BMP ch.1 regen; POC-DOUG revw; SSRMS/ESP-3; Hatch seal inspect; CGSE troubleshoot; EMER OBT; ATV MBRL/PCE uninstall; Iridium phone recharge.
- Tue. (9/9): SLEEP; Acoustic Survey; BMP ch.2 regen; TORU OBT; O-OHA; EMU batt. maint.; BCAT-3 fam.; PMCs; JAXA AQUA-Ink Ball exp.; MBI-12.
- Wed. (9/10): SLEEP; MBI-18; MBI-12 term/dwnld; "Life on ISS" video; RS Video/MPEG-2 Ku-Band test; CGSE troubleshoot; SOTR-SMOK R&R; SSK/ MAS T+5 analyses; BCAT-3/-4.

ISS Orbit (as of this morning, 8:49am EDT [= epoch]):

Mean altitude -- 353.3 km
Apogee height -- 358.0 km
Perigee height -- 348.7 km
Period -- 91.61 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006899
Solar Beta Angle -- 18.5 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 62 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56117

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/08/08 -- Progress M-64/29P de-orbit (~4:45pm)
09/10/08 -- Progress M-65/30P launch (~3:49:45pm)
09/12/08 -- Progress M-65/30P docking (SM aft, ~5:08pm DM)
09/29/08 -- ATV de-orbit (nighttime re-entry for observation from 2 NASA planes; 9:12pm)
10/01/08 -- **NASA 50 Years** (official)
10/10/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4) 12:33am ***[new target date]***
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) or 10/24?
11/12/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC ***[new target date]***
11/14/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD

05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/04/08
Date:	Thursday, September 04, 2008 2:00:12 PM
Attachments:	

ISS On-Orbit Status 09/04/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Volkov serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out"-to-vacuum cycle on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~5:15pm EDT. Filter bed #1 was regenerated yesterday. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time: 8/28 & 29).]*

FE-1 Kononenko continued the current reloading and scanning of Russian crew support laptops and flash memory cards with new antivirus software from DVD, then downlinking the results and consulting with ground specialists via S-band tagup. Today's activity focused on the RSK2 and RSE-med laptops. Memory cards and DVDs are coming up next.

Kononenko also performed maintenance on the SRV-K2M condensate water processor, replacing both BRPK separators (Lines 1/2) with new spares. *[The BRPK-1 was recently reported to have lasted only about 80% of its expected life-time.]*

Volkov meanwhile worked on the Russian SOTR Thermal Control System in the SM (Service Module), repeating his earlier (8/15) attempt to drain coolant from the #1 loop (KOB-1) to conduct pressure readings at various valve settings and reposition the membrane separating loop gas & liquids to improve hardware function. After the tests, which included an air flow and leak test, the loop was to be restored to its initial configuration. *[Purpose of the coolant draining was to determine the volume of free air in KOB-1 and check the leak tightness of the KOB-1 accumulator bellows; also: to perform preventive maintenance on the SOTR loops' solenoid valves.]*

The CDR had an hour to collect and prepare new pipelines, connectors and all necessary tooling for tomorrow's scheduled removal & replacement of the renewable SMOK condensate removal lines in the SOTR.

FE-2 Chamitoff completed the weekly 10-min. CWC (Contingency Water Container) inventory as part of on-going WRM (Water Recovery & Management) assessment of onboard water supplies. Updated "cue cards" based on the crew's water calldowns are sent up every other week. *[The new card (17-0002X) lists 31 CWCs (~1163.8 L total) for the four types of water identified on board: technical water (385.0 L, for flushing only because of* Wautersia *bacteria), potable water (706.7 L, incl. 174.6 L currently on hold), condensate water (54.1 L), waste/EMU dump and other (17 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

The FE-2 worked on the MPC (Multi-Purpose Converter) to configure its data rate for upcoming Kibo JPM (JEM Pressurized Module) operations. *[The MPC is part of the video equipment used for HDTV (High Definition TV) playback & downlink by ground commanding.]*

In preparation for another run with the US SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment, Gregory first downloaded SLEEP data from his Actiwatch to the HRF-1 (Human Research Facility 1) laptop for subsequent downlink & verification by the support scientist, then re-initialized and donned the Actiwatch. *[To monitor his sleep/wake patterns and light exposure, Chamitoff now wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout this run. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

Chamitoff prepared six R11 HDDs (hard disk drives) for the upcoming upgrade to CCS (Command & Control System) software vers. R7 by "ghosting" them with the desired file structure/image from CD. *[One each of the HDDs (##1149, 1150, 1157, 1170, 1177, 1190) for the six deployed PCS laptops.]*

Volkov unstowed an electronic box of the German GTS (Global Timing System) payload from the FGB and transferred it to the COL (Columbus Orbital Laboratory) for temporary stowage in the EDT (European Drawer Rack, COL1F1_F1).

Preparatory to tomorrow's ATV undocking, CDR Volkov verified proper setup of the IWIS RSUs (Internal Wireless Instrumentation System Remote Sensor Units) in the Lab, Node-1, Node-2, FGB and SM, then programmed the timing of the IWIS ICU (Interface Control Unit) for the automated activation (start time 5:07pm EDT).

[IWIS will monitor dynamic/vibrational responses of the ISS structure during the ATV undocking, measured by RSUs which transmit their measurements via radio to the central NCU (Network Control Unit). Structural vibrational data will also be taken by the SDMS (Structural Dynamic Measurement System).]

After removing smoke detectors, GLA (General Luminaire Assembly) light fixtures and other useful equipment from the ATV on TsUP/Moscow Go for recycling, Volkov & Kononenko stepped through final preparations for tomorrow's undocking of "Jules Verne by –

- Removing the quick-release screw clamps which had rigidized the docking joint,
- Taking & downlinking ATV/SM interface photo/video documentation before hatch closure,
- Closing the ATV-SU (outer) and PrK-SU (inner) transfer vestibule hatches (~12:30pm EDT),
- Testing the TV downlink from the RS (Russian Segment) over the MPEG-2 (Moving Pictures Expert Group 2) encoder via U.S. OpsLAN and Ku-band in "streaming video" packets,
- Performing the usual one-hour leak check on both hatches, and
- Powering down the onboard Kenwood ham radio equipment to prevent RF (radio frequency) interference during ATV proximity operations.

Greg took measurements for the regular atmospheric status check for ppCO_2 (Carbon Dioxide partial pressure) in the Lab, SM at panel 449 and COL (Columbus Orbital Laboratory) plus battery ticks, using the hand-held CDMK (CO_2 Monitoring Kit, #1002). The unit was then deactivated and returned to its stowage location (LAB1S2). *[Purpose of the 5-min activity is to trend with MCA (Major Constituents Analyzer), i.e., to correlate the hand-held readings with MCA measurements.]*

The FE-1 conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Oleg also completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Kononenko also reformatted his TVIS treadmill physical exercise PCMCIA (Portable Computer Memory Card International Adapter) storage card on the MEC (Medical

Equipment Computer).

The station residents conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

Later, Volkov transferred the exercise data files to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control ppCO_2 levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS (Internal Thermal Control System) cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking. CDRA remains "yellow" on the ISS critical systems list.]*

A new addition to Chamitoff's voluntary "job jar" task list was to remove WAICO1 ECs (Experiment Containers) and exchange Reference ECs on Rotor B of the BLB (Biolab) incubator in the COL.

CGSE Troubleshooting Update: The first part of CGSE (Common Gas Supply Equipment) CO_2 leak troubleshooting in the JAXA JPM (JEM Pressurized Module) was initiated yesterday as reported, but not completed for lack of time. Teams plan to add the missing steps into Part 2 of the troubleshooting. *[On 8/8, the CBEF (Cell Biology Experiment Facility) in the SAIBO rack exhibited a sudden unexpected pressure drop at the CGSE CO_2 high-pressure sensor, from 3000 kPa to 500 kPa within 1.5 minutes. Specialists believe that the SSV (Self-Shutoff Valve) closed itself unexpectedly, making it a potential contributor to the sudden pressure decrease. Also suspected is a leak from the CO_2 supply line.]*

Reboost Planning Update: Teams are discussing reboost plans to meet Soyuz landing phasing and rendezvous conditions for ULF-2. Russia has proposed the reboost during a major U.S. software transition (to CCS Vers. R7), and teams are working to resolve this conflict.

CSA Personnel Announcement: Canadian Space Agency has elected Steven Glenwood MacLean as their new President. Dr. MacLean has flown twice on the

Shuttle (STS-52; STS-115), becoming the first Canadian Astronaut to operate the Canada-built SSRMS (Space Station Remote Manipulator System) on the ISS and the second Canadian to walk in space. Congratulations, Steve!

ATV "Jules Verne" Undocking Update: Tomorrow the ATV cargo ship, with ~900 kg (2,000 lbs) of dry waste and 254 kg (560 pounds) of liquid waste, will undock from the ISS SM aft port. The crew will undergo a slight sleep cycle shift to accommodate the event, viz., wake-up at 3:30am EDT (instead of 2:00am) and sleeptime at 7:00pm (instead of 5:30pm). The ATV summary flight plan is as follows (times are Eastern):

- ISS mnvr to undocking attitude 3:10pm EDT
- ISS Free Drift 5:27pm
- Sunrise 5:27:36pm
- Undock Command 5:28pm
- Phys.Sep/hooks open (spring delta-V≈0.08m/s) **5:31pm**
- ATV departure mnvr (316 s, delta-V≈4.00 m/s) 5:32pm
- ISS mnvr to TEA attitude 5:55pm
- Sunset 6:24pm
- *Independent flight until deorbit on 9/29 (Monday):*
- Deorbit Burn #1 (29.80 m/s) 6:14:39am
- Deorbit Burn #2 (70.28 m/s) 9:12:27am

CEO (Crew Earth Observations) photo targets uplinked for today were **Tin Bider Impact Crater, Algeria** *(ISS had a nadir pass over this well-exposed, 6-km diameter impact structure. The concentric ring structure of the crater is bordered on three sides by relatively flat desert),* **Hurricane Ike, Atlantic Ocean** *(looking to the left of track for this compact storm, predicted to be a Category 1 hurricane at the time of this overpass [9:41am EDT]. The storm is currently predicted to head westwards towards Cuba. Looking for outflow banding and an eye feature),* **Araguainha Impact Crater, Brazil** *(weather was predicted to be clear over central Brazil, providing an opportunity to photograph this impact structure. The expression of this 40-km diameter crater on the landscape is subtle, and is mainly defined by circular variations in vegetation patterns. Overlapping mapping frames, taken along-track, present the best technique for imaging the crater),* and **High Central Andean Glaciers, S. America** *(looking to the left of track as ISS began to parallel the South American coastline for views of the western slopes of the Andes Mountains. Oblique imagery of glaciers and icefields located near the summits and upper slopes of the mountains was requested)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 20/21 Scheduled Main Activities:

- Fri. (9/5): ATV Undock (5:31pm EDT); PCS reboot; Microbial water & surface sampling; CGSE troubleshoot?
- Sat. (9/6): FFQ; IWIS deactivation.
- Sun. (9/7): Station cleaning; DCP video bypass cable install for Robotics; PFC (FE-2).
- Mon. (9/8): SLEEP; Acoustic Survey; BMP ch.1 regen; POC-DOUG revw; SSRMS/ESP-3; Hatch seal inspect; CGSE troubleshoot; EMER OBT; ATV MBRL/PCE uninstall; Iridium phone recharge.
- Tue. (9/9): SLEEP; Acoustic Survey; BMP ch.2 regen; TORU OBT; O-OHA; EMU batt. maint.; BCAT-3 fam.; PMCs; JAXA AQUA-Ink Ball exp.

ISS Orbit (as of this morning, 8:03am EDT [= epoch]):
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Perigee height -- 348.7 km
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Eccentricity -- 0.0006906
Solar Beta Angle -- 14.1 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 61 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56101

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/05/08 -- ATV1 undocking, from SM aft port (~5:31pm); independent flight
09/08/08 -- Progress M-64/29P de-orbit (~4:45pm)
09/10/08 -- Progress M-65/30P launch (~3:49:45pm)
09/12/08 -- Progress M-65/30P docking (SM aft, ~5:08pm DM)
09/29/08 -- ATV de-orbit (nighttime re-entry for observation from 2 NASA planes; 9:12pm)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
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10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) or 10/24?
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
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11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
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03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/03/08
Date:	Wednesday, September 03, 2008 12:54:29 PM
Attachments:	

ISS On-Orbit Status 09/03/08

All ISS systems continue to function nominally, except those noted previously or below.

Before breakfast, the CDR, FE-1 and FE-2 completed another periodic session of the Russian biomedical routine assessment PZEh-MO-7/Calf Volume Measurement (seventh for CDR & FE-1, fifth for FE-2). *[Calf measurements (left leg only) are taken with the IZOG device, a custom-sewn fabric cuff that fits over the calf, using the knee and lower foot as fixed reference pints, to provide a rough index of deconditioning in zero-G and effectiveness of countermeasures.]*

Volkov & Kononenko each spent ~1.5 hrs on the TVIS for the periodic Russian PZE-MO-3 test for physical fitness evaluation, their second time, using the TVIS in unmotorized (manual control) mode and wearing the Kardiokassette KK-2000 belt with three chest electrodes. *[The fitness test, controlled from the RSE-Med laptop, yields ECG (electrocardiogram) readings to the KK-2000 data storage device, later downlinked via the Regul (BSR-TM) payload telemetry channel. Before the run, the KK-2000 was synchronized with the computer date/time readings. For the ECG, the crewmembers worked out on the treadmill, first walking 3 min. up to 3.5 km/h, then running at a medium pace of 6.5 km/h, followed by the maximum pace not exceeding 10 km/h, then walking again at gradually decreasing pace.]*

Volkov also performed the periodic maintenance of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The process will be terminated at ~5:15pm EDT and Bed #2 regeneration performed tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time: 8/28 & 29)];*

Chamitoff worked on the outfitting of the U.S. Regenerative ECLSS, to install the

new oxygen (O_2) port on the PD4 standoff in the Lab for the WRS (Water Recovery System), after venting the new CHeCS (Crew Health Care Systems) rack O_2 supply hose to prevent contamination, then relocating the umbilical to the new port, purging it and the CHeCS O_2 port and configuring the setup for an overnight leak check. This activity was deferred on 8/25 when the FE-2 could not locate, for a while, the missing NOPA (N_2 O_2 Purge Adapter) hardware required for purging to evacuate any air in the system. *[The CHeCS rack will be relocated in the near future in the U.S. Lab from the D4 position to the S4 position in order to install the WRS-1 rack during STS-126/ULF2. Since there will be no O_2 connection to the CHeCS rack at the S4 location, the new O_2 port must be installed, also to interface with the Regenerative ECLSS system to maintain a functional O_2 port in the D4 bay of the Lab.]*

After filling the CHeCS, WRS-1 and WRS-2 MTL (Moderate Temperature Loop) supply jumpers with ITCS (Internal Thermal Control System) coolant at two Lab positions, set up yesterday, the FE-2 today disconnected and removed the remaining MTL jumper. *[The hoses need to be filled prior to mating them to their respective racks. The WRS will be used to recycle wastewater into potable water. The Regenerative ECLSS will be required for the future six-person occupancy of the station.]*

Kononenko and Volkov conducted an audit of free stowage space in the RS (Russian Segment), i.e., FGB, SM (Service Module) and DC1 (Docking Compartment), addressing specific questions uplinked in a questionnaire on 8/29.

The CDR also retrieved the three copies of the 1J Warning Book from Lab, SM and FGB, replaced two pages (on Loop A/B thermal pump outlet temperature limits) with new material, then restowed the books. The old pages were discarded as trash.

The FE-1 loaded the Russian laptops RSK1, RSK2, RSE-med, RSS1 and RSE1 with new antivirus software from DVD, scanned the hard disks, taking documentary Nikon photos of the resulting message displays, and consulted with ground specialists via S-band tagup.

The FE-2 initiated the ghost loading of the SAMS (Space Acceleration Measurement System) hard drive with new image structures, to be terminated about 7 hrs later before bedtime.

Oleg continued the current round of periodic preventive maintenance of cabin ventilation systems in the RS, today cleaning the “Group A” fan grilles in the SM.

Gregory had 2:10 hrs reserved for the first part of CGSE (Common Gas Supply Equipment) troubleshooting in the JAXA JPM (JEM Pressurized Module).
[Working on the SSV (Self-Shutoff Valve) in the CGSE Valve Unit, Chamitoff's task today was to recover the SSV, i.e., restore functionality, then isolate the SAIBO rack from the system CO_2 line by disconnecting the QD (Quick Disconnect) on the UIP (Utility Interface Panel/Z-Panel) ands repressurize the system CO_2 line, to be monitored by SSIPC (Space Station Integration & Promotion Center) at Tsukuba/ Japan for two days to determine if either the system or the payload is the CO_2 leak source. On 8/8, the CBEF (Cell Biology Experiment Facility) in the SAIBO rack exhibited a sudden unexpected pressure drop at the CGSE CO_2 high-pressure sensor, from 3000 kPa to 500 kPa within 1.5 minutes. Specialists believe that the SSV closed itself unexpectedly, making it a potential contributor to the sudden pressure decrease. Also suspected is leakage from the CO_2 supply line. Part 2 of troubleshooting, on 9/5, will depend on the result of the overnight leak check.]

Later today (~3:30pm EDT), Oleg Kononenko will support a 20-min. systems test of the newly installed ATV PCE (Automated Transfer Vehicle/Proximity Communications Equipment, Russian: MBRL), specifically the BUAP Antenna Feeder Unit and the PU control console for the ATV, preparatory to Friday's undocking of "Jules Verne".

Sergey Volkov conducted the periodic audit/inspection of available photo/video equipment in the RS, in particular four camcorders (including three SONY HVR-Z1J digital high-definition video cameras), one DVCAM, adapter brackets and mounting plates.

Greg Chamitoff had ~1:50 hr set aside for continuing to unpack and stow cargo delivered on STS-124/1J/Discovery on 6/2.

Sergey took care of the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The CDR also completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

On the Russian Matryoshka-R (RBO-3-2) radiation payload in the DC1, Oleg checked out a memory card and activated the AST Spectrometer for data takes. *[After retrieving a used PCMCIA (Portable Computer Memory Card International Adapter) card, ALC-951, from stowage, Oleg activated the AST twice to verify the card's labels and orientation, then re-inserted ALC-951 in the spectrometer and activated the AST again.]*

The FE-1 took the periodic photographs of the plants growing in the BIO-5 Rasteniya-2 ("Plants-2") Lada-13 greenhouse, using the Nikon D2X photo camera with F=17-55 mm lens, then downlinked the images via Regul BSR-TM. The regular status check of the payload which researches growth and development of plants (barley) under spaceflight conditions was conducted as per suggestion by the discretionary "time permitting" task list.

In the U.S. Lab, Sergey Volkov performed a controlled shut-down of the EHS VOA (Environmental Health System-Volatile Organic Analyzer), with the ground power-cycling its RPC (Remote Power Controller).

Gregory completed another one of the periodic inspections of the RED (Resistive Exercise Device) canister cords and accessories, currently done every two weeks.

The station residents conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR/MO-3, FE-1/MO-3), RED resistive exercise device (FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1). Later, Kononenko transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control ppCO_2 levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS (Internal Thermal Control System) cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking.]*

ISS Wireless LAN Transition: Yesterday, after beginning the transition of the JSL (Joint Station LAN) Network to the new WAPs (Wireless Access Points) in Node-1 & Node-2 and loading the PDAs (Personal Data Assistants) with new applications for wireless (RF) comm, hardware and software configuration issues prevented Greg Chamitoff from completing the scheduled survey of wireless LAN (Local Area

Network) connectivity aboard, intended to assess wireless LAN for Node-3 network interfaces (vs. wired interfaces). The survey will have to be re-scheduled.

JAXA Kibo GLA Failures: A total of six GLAs (General Luminaire Assemblies) have now been reported failed in the JPM. There are still ten GLAs functioning, and there is no impact for crew activity. In the JLP (JEM Logistics Pressurized Segment), two GLAs have failed, with only one GLA remaining. Removal of the failed light fixtures and replacement with spares is being planned for both Kibo modules.

CEO (Crew Earth Observations) photo targets uplinked for today were S. Mozambique, Africa *(ISS had a nadir pass over this site, and overlapping mapping frames taken along track were requested. The region is undergoing rapid development, and imagery of the existing state of land cover will be useful to track changes to regional ecosystems over time),* Hurricane Hanna, Atlantic Ocean *(Dynamic Event. This tropical cyclone was predicted to regain hurricane strength by the time of this pass [10:47am EDT]. Looking ahead and to the right of track for cloud banding and eye features. The storm will be passing over the Bahamas),* High Central Andean Glaciers, S. America *(weather was predicted to be mostly clear over the eastern slopes of the Andes. Looking to the right of track for glaciers and icefields on the upper mountain slope - imagery of these glaciers is useful for tracking changes in ice extent and volume. Overlapping mapping frames were requested as ISS paralleled the Andes from NW to SE),* and Beni River dynamics, Bolivia *(the Beni River rises in the eastern Andes range, and flows for almost 1600 km [994 miles] across Bolivia. General context imagery of the river was requested to guide later higher resolution imagery of the river channel and banks. The regional of interest for photography is east of the Andes. Greg was to look for Lake Titicaca as a landmark feature)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 20/21 Scheduled Main Activities:

- Thu. (9/4): SOTR-KOB1 maintenance; SRVK-BRPK maintenance; BMP ch.2 regen; CWC audit; SLEEP init.; PCS s/w load-ghosting; IWIS reprogram; ATV: activate/remove equipment & SSVP docking system/close hatches/take photo+video; TVS-MPEG Ku-band test.
- Fri. (9/5): ATV Undock (5:27pm EDT); PCS reboot; microbial sampling; CGSE troubleshoot.
- Sat. (9/6): FFQ; IWIS deact.
- Sun. (9/7): Station cleaning; DCP bypass cable install; PFC (FE-2).

- Mon. (9/8): SLEEP; Acoustic Survey; BMP regen ch.1; POC-DOUG revw; SSRMS/ESP-3; Hatch seal inspect; CGSE troubleshoot; EMER OBT; ATV MBRL/PCE uninstall; Iridium phone recharge.
- Tue. (9/9): SLEEP; Acoustic Survey; BMP regen ch.2; TORU OBT; O-OHA; EMU batt. maint.; BCAT-3 fam.; PMCs; JAXA AQUA-Ink Ball exp.

ISS Orbit (as of this morning, 7:36am EDT [= epoch]):
Mean altitude -- 353.5 km
Apogee height -- 358.0 km
Perigee height -- 348.9 km
Period -- 91.61 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006736
Solar Beta Angle -- 9.6 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 44 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56085

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/05/08 -- ATV1 undocking, from SM aft port (~5:27pm); independent flight
09/08/08 -- Progress M-64/29P de-orbit (~4:45pm)
09/10/08 -- Progress M-65/30P launch (~3:49:45pm)
09/12/08 -- Progress M-65/30P docking (SM aft, ~5:08pm DM)
09/29/08 -- ATV de-orbit (nighttime re-entry for observation)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) or 10/24?
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)

03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 09/02/08
Date:	Tuesday, September 02, 2008 1:01:02 PM
Attachments:	

ISS On-Orbit Status 09/02/08

All ISS systems continue to function nominally, except those noted previously or below.

FE-1 Kononenko finished up the installation of ATV PCE (Automated Transfer Vehicle/Proximity Communications Equipment; Russian: MBRL) in the Service Module (SM), installing and connecting its BUAP antenna switching control box to the BKS onboard cabling system for ground-commanding. CDR Volkov then set up the ATV control panel (PU) in the SM and activated it. *[The main MBRL components are the space-to-space radio "monoblock" (PCE Z0000), the BUAP, and the PU.]*

After the installations, the temporarily disconnected BITS2-12 onboard telemetry system and VD-SU control mode (which also required the Elektron O_2 generator to be turned off) was re-connected and activated.

Elektron was then restarted in 32A mode by the ground, with Kononenko monitoring the external temperature of its secondary purification unit (BD) for the first 10 minutes of operations to ensure that there was no overheating.

Also, as a new regular activity after deactivation/reactivation of the VD-SU control mode, Oleg checked the BRI Smart Switch Router computer and its new Ethernet connection to assess any impact of these activities on Ethernet comm. *[BRI is part of the RS OpsLAN (Russian Segment/Operations Local Area Network), with connections to the three SSC clients, the Ethernet tie-in with the US network, and a network printer in the RS.]*

In preparation for the ATV "Jules Verne" undocking on Friday (9/5), Volkov and Kononenko tagged up with a ground specialist who took them through a special 45-min OBT (Onboard Training) exercise for Undocking & Departure, using an ATV OBT training tool on an SSC (Station Support Computer) laptop and a review of salient ODF (Operations Data File) tutorial material, wrapping up the exercise with a

joint debriefing.

FE-2 Chamitoff meanwhile performed the periodic water sampling, collecting chemical/archival post-flight potable water samples at the SRV-K Warm and SVO-ZV taps, using jointly approved Russian sampling procedures with the U.S. WS&A (Water Sampler & Archiver) kit for collection. The samples will be returned on the ULF2 flight. The water used for flushing the sampling equipment was then reclaimed from its collection bags and wet towels in the interest of water inventory conservation.

Volkov & Chamitoff completed another monthly session (Sergey's fourth, Gregory's second) of the CHeCS (Crew Health Care Systems) emergency medical operations OBT drill, a 30-min. exercise to refresh their CMO (Crew Medical Officer)'s acuity in a number of critical health areas. The proficiency drill today focused on airway management. *[The HMS (Health Maintenance Systems) hardware, including ACLS (Advanced Cardiac Life Support) equipment, may be used in contingency situations where crew life is at risk. To maintain proficiency, crewmembers some time each month reviewing HMS and ACLS equipment and procedures via the HMS and ACLS CBT (computer-based training). The training drill, each crewmember for him/herself, refreshes their memory of the on-orbit stowage and deployment locations, equipment etc. and procedures.]*

Oleg performed the periodic (monthly) functional closure test of the Vozdukh CO_2 (carbon dioxide) removal system's spare emergency vacuum valves (AVK), in the spare parts kit. *[The AVKs are crucial because they close the Vozdukh's vacuum access lines in the event of a malfunction in the regular vacuum valves (BVK) or a depressurization in the Vozdukh valve panel (BOA). Access to vacuum is required to vent CO_2 during the regeneration of the absorbent cartridges (PP).*

Greg Chamitoff continued outfitting for the new Regenerative ECLSS, today installing CHeCS (Crew Health Care Systems), WRS-1 (Water Recovery System 1) and WRS-2 MTL (Moderate Temperature Loop) supply jumpers to fill them with ITCS (Internal Thermal Control System) coolant at two Lab positions. The supply lines were then removed. *[The jumpers need to be filled prior to mating them to their respective racks. The WRS will be used to recycle wastewater into potable water. The Regenerative ECLSS will be required for the future six-person occupancy of the station.]*

Sergey downloaded the accumulated structural dynamics data from yesterday's Progress undocking from the IWIS RSUs (Internal Wireless Instrumentation System/ Remote Sensor Units).

Working in the Kibo laboratory on JAXA's CBEF (Cell Biology Experiment Facility), Greg installed special acoustic insulation/dampening material on the CBEF Incubator doors.

Afterwards, Chamitoff transitioned the ISS JSL (Joint Station LAN) network to a new Access Point in Node-1 and Node-2.

Greg then loaded three onboard PDAs (Personal Digital Assistants) with new applications,- two with BCR (Barcode Reader) software (replacing the previous "Dolphin" BCRs), the third with WINS (Windows Internet Name Service) software next week. *[WINS is Microsoft's implementation of NetBIOS Name Service (NBNS), a name server and service for NetBIOS computer names (equivalent to what DNS is to domain names).]*

Next, in the JPM (JEM Pressurized Module), the FE-2 activated the SSC-14 laptop with its new wireless capability, performed a functionality check on it from two different JPM locations and disconnected/removed its ISL Ethernet drag-through cable which had been plugged in in Node-2. SSC-14 was then temporarily moved to COL (Columbus Orbital Laboratory) for testing wireless functionality (e.g., signal strength) and later returned to JPM.

Gregory wrapped up the wireless LAN survey aboard ISS by using the PDA with WINS in similar fashion from the JPM, later the U.S. Airlock, to check out its wireless functionality and correlation with the SSC survey.

Sergey completed the periodic (about twice a month) replenishing of the Elektron's water supply for electrolysis, filling the KOV thermal loops' EDV container with purified water from CWC (Contingency Water Container, #1051) collected by the U. S. CCAA (Common Cabin Air Assembly). *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron micropump shutdown.]*

On the Russian Matryoshka-R (RBO-3-2) radiation payload in the DC1 Docking Compartment, Oleg deactivated the AST Spectrometer, removed its ALC-949 PCMCIA (Portable Computer Memory Card International Adapter) and checked out its contents on the RSK-1 laptop. AST remains off.

In the FGB *(Funktsionalnyi-Grusovoi Blok),* Sergey replaced the two dust filters (PS1, PS2) and cleaned the mesh screens of the central ventilation fans (TsV1, TsV2), with the fans running.

Gregory performed the periodic routine maintenance on the four CSA-CP (Compound Specific Analyzer-Combustion Products) instruments, changing out the

battery in the prime unit and zero-calibrating all four units (to eliminate drift in the combustion sensors) before returning all CSA-CPs to their original locations (prime unit at SM Central Post).

The CDR took care of the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Volkov also completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew had their periodic PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Sergey at ~11:55am, Oleg at ~12:10pm, Greg at ~1:10pm EDT.

The station residents conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-1, FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (CDR). Later, Kononenko transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control $ppCO_2$ levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS (Internal Thermal Control System) cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking.]*

KURS Test: TsUP/Moscow has scheduled a test today of both strings of the KURS automated rendezvous radio command system for the SM aft port, in preparation for the ATV undocking on Friday (9/5).

IMMT to lose Toulouse: With the ATV "Jules Verne" slated to undock next Friday, its French ESA representative today sadly said goodbye to the globe-spanning ISS Mission Management Team (IMMT). ATV however remains a solid and important member of the ISS "family", and Toulouse will always be welcomed back gladly.

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 20 Scheduled Main Activities:

- Wed. (9/3): MO-7 (all); RED inspection; BMP ch.1 regen; MO-3/FE-1 (TVIS); WRS O_2 purge/port install/leak check; SAMS s/w load; CGSE troubleshooting; BRTK-MBRL (PCE) test 1.
- Thu. (9/4): SOTR-KOB1 maintenance; SRVK-BRPK maintenance; BMP ch.2 regen; CWC audit; SLEEP init.; PCS s/w load-ghosting; IWIS reprogram; ATV: activate/remove equipment & SSVP docking system/close hatches/take photo+video; TVS-MPEG Ku-band test.
- Fri. (9/5): ATV Undock (5:27pm EDT); PCS reboot; microbial sampling; CGSE troubleshoot.
- Sat. (9/6): FFQ; IWIS deact.

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Perigee height -- 349.0 km
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Eccentricity -- 0.0006673
Solar Beta Angle -- 5.1 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 54 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56070

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
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09/12/08 -- Progress M-65/30P docking (SM aft, ~5:08pm DM)
09/29/08 -- ATV de-orbit (nighttime re-entry for observation)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
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10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)

10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) or 10/24?
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
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05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
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10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From: vonPuttkamer, Jesco H. (HQ-CJ000)

To: Von Puttkamer, Jesco H. (HQ-CE010);

CC:

Subject: ISS On-Orbit Status 09/01/08

Date: Monday, September 01, 2008 4:00:00 PM

Attachments:

ISS On-Orbit Status 09/01/08

All ISS systems continue to function nominally, except those noted previously or below. *Labor Day – off duty for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff. Underway: Week 20 of Increment 17.*

Progress M-64/29P successfully undocked from the ISS FGB nadir port this afternoon at 3:47pm EDT. The first separation burn was on time at 3:49pm, as was sep burn #2 at 3:55pm. 29P will remain in orbit in independent flight until 9/9, continuing to phase out in front of the ISS (about 40 km per orbit) in order to support a Russian "Plasma" experiment. The ship will then deorbit for destructive reentry over the Pacific Ocean. *[The separation appeared smooth, with no anomalous behavior reported by the crew. After handing over attitude control to Russian MCS (Motion Control System) at 1:45pm EDT, the ISS will return to US Momentum Management (MM) at approximately 5:45pm.]*
As part of the crew's regular morning inspection tour, CDR Volkov conducted the routine checkup of DC1 Docking Compartment circuit breakers and fuses. *[The monthly checkup in the "Pirs" module looks at AZS circuit breakers on the BVP Amp Switch Panel (they should all be On) and the LEDs (light-emitting diodes) of 14 fuses in fuse panels BPP-30 & BPP-36.]*

FE-2 Chamitoff performed visual & functional inspections on two CSA-CP (Compound Specific Analyzer-Combustion Products) probes and sampling pumps, one in Node-1, the other in Node-2. *[If both probes were found undamaged, they were to be reconnected to their pumps and deployed on the original panel. If only one CSA-CP probe is undamaged, its preferred deployment location is in Node-1.]*

Gregory also conducted ELPS (Emergency Lighting & Power Supply) inspections in the JAXA JPM (JEM Pressurized Module) and JLP (JEM Logistics Pressurized Section), as well as in the ESA COL (Columbus Orbital Facility).

FE-1 Kononenko took care of the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM (Service

Module). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Preparatory to today's Progress undocking, CDR Volkov set up the IWIS RSUs (Internal Wireless Instrumentation System Remote Sensor Units) in the Lab, Node-1, Node-2, FGB and SM. Afterwards, Sergey configured and programmed the timing of the IWIS ICU (Interface Control Unit) for the automated activation. *[IWIS monitored dynamic/vibrational responses of the ISS structure during the undocking, measured by RSUs which transmit their measurements via radio to the central NCU (Network Control Unit). Structural vibrational data were also taken by the SDMS (Structural Dynamic Measurement System) during the SARJ (Solar Array Rotary Joint) rotation (for solar array protection) and 29P undocking.]*

Chamitoff verified proper closure of the protective window shutters in the Kibo JPM and U.S. Lab for the duration of Progress departure.

Working off the Russian discretionary "time permitting" task list, Oleg conducted the regular status check of the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (barley) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

At ~11:15am EDT, Gregory powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, & power supply) and conducted, at 11:20am, a ham radio exchange with the Challenger Learning Center of Lucas County, Oregon, Ohio. The Challenger Learning Center (CLC) is part of a network of over 51 Centers throughout the United States, the United Kingdom, and Canada. Each Center is owned and operated locally by a host institution, in this case the Lucas County Educational Service Center. These CLCs are the primary component of the Challenger Center for Space Science Education founded by the families of the astronauts tragically lost during the launch of the Challenger Space Shuttle in January 1986. Dedicated to the educational spirit of that mission, each CLC continues the mission through a unique hands-on learning experience in which students use math, science, teamwork, problem-solving, responsible decision-making, and communication skills to successfully complete a simulated space mission. Since their opening in the fall of 2003, the Lucas County CLC has trained over 400 teachers and has flown over 480 missions. The CLC mission focuses on students in grades 5 and above. Over 12,000 students have successfully accomplished missions to the moon or Mars; nearly 1,500 community members and corporate staff have flown. Questions were uplinked to Greg beforehand. *["What do you do for fun, and how much time do you have for fun?"; "What do you do for entertainment as a crew?"; "What one thing*

have you discovered from being on the space station that has surprised you the most?"; "Which college course prepared you the most for being an astronaut or aerospace engineer?"; "How eco-friendly is the ISS?"; "What do you like best about being an astronaut/cosmonaut?"; "What part of your astronaut/cosmonaut training helped you prepare for the mission the most?"; "What is the most unusual item that has been taken onboard the ISS?"; "What has been your greatest challenge in life?"; "What role could the ISS play in a crisis or is it inaccessible and why?"; "What is the closest the station has come to an emergency such as a fire or being hit by stray rocks from a passing comet?"; "How can we as students help NASA?"]

At Progress undocking, Sergey Volkov used the Nikon D2X camera with f80-400 zoom lens from an SM window to take the regular photographs of the cargo ship's docking system, checking for its cleanliness (i.e., to verify that no rubber seals are missing on the Progress docking interface and to assess seal integrity).

Oleg Kononenko meanwhile monitored the undocking and separation of the spacecraft on the VKU video monitor.

After 29P departure, the CDR completed the usual manual closing of the FGB GA docking compartment-to-vestibule PEV (Pressure Equalization Valve; Russian: KVD).

The station residents conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Greg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control ppCO_2 levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS (Internal Thermal Control System) cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking.]*

Hurricane Gustav Update: As of this morning, JSC/MCC-Houston is open and remains at Level 4 until tomorrow morning (9/2) when the Center will begin backing out of Level 4 as employees arrive at work after the Labor Day holiday. The BAT team at Round Rock, TX, was able to work out some connectivity issues yesterday;

they plan to do a few additional tests this morning and will then start heading back to Houston. The BCC (Backup Control Center) team arrived in Huntsville last night. They also plan to do some BCC checkouts and then will start making plans to return to Houston tonight or tomorrow.

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 20 Scheduled Main Activities:

- Tue. (9/2): ATV Undock OBT; BUAP/MBRL (PCE) equipment install in SM (ATV hand controller, antenna switch box, prox comm unit); Elektron deact/act; Vozdukh AVK test; FGB PS1/PS2 filter & TsV1 screen cleaning; USOS water sampling; CMO profic.train.; FSL/FCE release.
- Wed. (9/3): MO-7 (all); RED inspection; BMP ch.1 regen; MO-3/FE-1 (TVIS); WRS O_2 purge/port install/leak check; SAMS s/w load; CGSE troubleshooting; BRTK-MBRL (PCE) test 1.
- Thu. (9/4): SOTR-KOB1 maintenance; SRVK-BRPK maintenance; BMP ch.2 regen; CWC audit; SLEEP init.; PCS s/w load-ghosting; IWIS reprogram; ATV: activate/remove equipment & SSVP docking system/close hatches/take photo+video; TVS-MPEG Ku-band test.
- Fri. (9/5): ATV Undock (5:27pm EDT); PCS reboot; microbial sampling; CGSE troubleshoot.
- Sat. (9/6): FFQ; IWIS deact.

ISS Orbit (as of this morning, 8:37am EDT [= epoch]):
Mean altitude -- 353.5 km
Apogee height -- 358.2 km
Perigee height -- 348.9 km
Period -- 91.61 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006909
Solar Beta Angle -- 0.7 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 53 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56054

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/05/08 -- ATV1 undocking, from SM aft port (~5:27pm); independent flight
09/09/08 -- Progress M-64/29P de-orbit (~5:19pm)

09/10/08 -- Progress M-65/30P launch (~3:49:45pm)
09/12/08 -- Progress M-65/30P docking (SM aft, ~5:08pm DM)
09/29/08 -- ATV de-orbit (nighttime re-entry for observation)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) or 10/24?
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/31/08
Date:	Sunday, August 31, 2008 1:01:47 PM
Attachments:	

ISS On-Orbit Status 08/31/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – rest day for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff. Ahead: Week 20 of Increment 17.*

Gregory Chamitoff had three hours reserved for the regular weekly station cleaning in the USOS (US Segment) which was not scheduled yesterday alongside the RS (Russian Segment) "uborka" housecleaning by his two crewmates.

Sergey Volkov conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. The CDR also checked up on the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem, gathering weekly data on total operating time & "On" durations for reporting to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Gregory completed a run with the MedOps experiment WinSCAT (Windows Spaceflight Cognitive Assessment Tool), his third onboard session, by logging in on the MEC (Medical Equipment Computer) and performing the psychological evaluation exercise on the laptop-based WinSCAT application. *[WinSCAT is a monthly time-constrained questionnaire test of cognitive abilities, routinely performed by astronauts aboard the ISS every 30 days before or after the PHS (periodic health status) test or on special CDR's, crewmembers or flight surgeons request.]*

Afterwards, the FE-2 closed the protective window shutters in the Kibo JPM (JEM Pressurized Module) and U.S. Lab in preparation for the Russian Solar Array

Efficiency test tonight (see below). *[The shutters can be opened again after USOS has resumed attitude control authority with MM (Momentum Management) after the test.]*

The station residents conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

The CDR and FE-2 were scheduled for their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Sergey at ~8:00am, Greg at ~4:05pm EDT.

Russian Solar Array Efficiency Test: During crew sleep, at 7:30pm-11:00pm EDT, TsUP/Moscow will conduct the periodic SM Solar Array Efficiency Testing, with no crew involvement or onboard powerdowns required. Attitude control handover from USOS CMGs (Control Moment Gyros) to Russian thrusters is scheduled for 7:20pm, to return to CMGs after the test. *[At test begin, the SM solar arrays will be shunted for the last 10 minutes of three successive insolation passes to measure the total current being produced by the photovoltaics. Array output will be compared to earlier tests at the same Beta angle and wing positions. Background: Photovoltaic current (ampères) is measured with a shunt, i.e., a resistor of accurately-known resistance (ohms) placed in series so that all electricity to be measured flows through it. Because of Ohm's Law (Current = Voltage divided by Resistance), the current flowing can then be calculated by measuring the voltage drop across the resistor.]*

Hurricane Gustav Update: As of last night (11:00pm EDT), NASA-JSC remains in Level 4 status until at least 11:00pm tonight (8/31). Back-up NASA flight control teams (BAT) have been deployed to Round Rock, TX, and an advance team was sent to the BBC (Backup Control Center) at Huntsville, AL, in case MCC-Houston needs to be evacuated. As of now, JSC does not expect to transition to Level 3 unless the storm track shifts dramatically westward. Should a transition to Level 3 be required, it would occur tonight, followed by transition to Level 2 shortly afterwards (Level 2 on Sunday night or early Monday AM). Storm track, condition and speed changes are continuously being monitored, and the team will be notified of any changes ASAP. The storm is currently expected to make landfall in central Louisiana in the timeframe of Monday evening (9/1). NASA's SSC (Stennis Space Center) and MAF (Michoud Assembly Facility) are closed, except for essential personnel.

Progress M-64/29P Undocking (Monday, 9/1): Tomorrow the 29P cargo ship-

turned-trash can will undock from the ISS FGB nadir port, according to the following summary flight plan:

- ISS Free Drift – FGB hooks opening 2:10pm
- ISS mnvr to duty attitude 2:20pm
- ISS mnvr to undocking attitude 3:13pm
- ISS to free drift 3:42pm
- Undock Command 3:43:30pm
- Sunrise 3:44:34pm
- Phys.Sep/hooks open (spring delta-V≈0.12m/s) **3:46:30pm**
- Progress sep burn #1 (15 sec, ≈0.635 m/s) 3:49:30pm
- ISS mnvr to TEA attitude 3:53:30pm
- Progress sep burn #2 (30 sec, ≈1.8 m/s) 3:55:40pm
- Progress retrograde burn (3 m/s) 6:53:15pm
- Independent flight until deorbit on 9/9.

Progress M-65/30P Launch (Wednesday, 9/10):

- Launch 3:50pm
- Orbital Insertion 3:58:43pm
- DV1 (14.33 m/s) 7:25pm
- DV2 (17.08 m/s) 8:12pm
- DV3 (2.00 m/s) 4:34pm (9/11)
- ISS mnvr to dock attitude 2:40pm (9/12)
- Progress Kurs-A Activ. (T1) 3:27pm
- SM Kurs-P Activation (T1) 3:29pm
- Sunrise 3:53pm
- Good Kurs-P data at 80 km 3:54pm
- Range = 9 km (TORU cmd link) 4:19pm
- Range = 8 km (30P TV activ.) 4:21pm
- Sunset 4:53:34pm
- Docking (9/12) **5:01pm**
- Progress hooks closed 5:21pm.

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 20 Scheduled Main Activities:

- Mon. (9/1, Labor Day): Crew off duty; Progress 29P Undock (~3:47pm); CSA-CP probe replacement; ham session; FSL/FCE lock.
- Tue. (9/2): ATV Undock OBT; BUAP/MBRL (PCE) equipment install in

SM (ATV hand controller, antenna switch box, prox comm unit); Elektron deact/act; Vozdukh AVK test; FGB PS1/PS2 filter & TsV1 screen cleaning; USOS water sampling; CMO profic.train.; FSL/FCE release.

- Wed. (9/3): MO-7 (all); RED inspection; BMP ch.1 regen; MO-3/FE-1 (TVIS); WRS O_2 purge/port install/leak check; SAMS s/w load; CGSE troubleshooting; BRTK-MBRL (PCE) test 1.
- Thu. (9/4): SOTR-KOB1 maintenance; SRVK-BRPK maintenance; BMP ch.2 regen; CWC audit; SLEEP init.; PCS s/w load-ghosting; IWIS reprogram; ATV: activate/remove equipment & SSVP docking system/close hatches/take photo+video; TVS-MPEG Ku-band test.
- Fri. (9/5): ATV Undock (5:27pm EDT); PCS reboot; microbial sampling; CGSE troubleshoot.
- Sat. (9/6): FFQ; IWIS deact.

ISS Orbit (as of this morning, 7:52am EDT [= epoch]):
Mean altitude -- 353.6 km
Apogee height -- 358.2 km
Perigee height -- 349.0 km
Period -- 91.61 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006873
Solar Beta Angle -- -3.7 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 42 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56038

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/01/08 -- Progress M-64/29P undocking, FGB nadir (~3:47pm); independent flight w/"Plasma" exp.
09/05/08 -- ATV1 undocking, from SM aft port (~5:27pm); independent flight
09/09/08 -- Progress M-64/29P de-orbit (~5:19pm)
09/10/08 -- Progress M-65/30P launch (~3:49:45pm)
09/12/08 -- Progress M-65/30P docking (SM aft, ~5:08pm DM)
09/29/08 -- ATV de-orbit (nighttime re-entry for observation)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft)
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11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking

11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
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04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/30/08
Date:	Saturday, August 30, 2008 1:34:56 PM
Attachments:	

ISS On-Orbit Status 08/30/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – mostly off duty for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff.*

Sergey Volkov & Oleg Kononenko performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the SM (Service Module) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

As part of the house cleaning, the crew conducted regular maintenance inspection & cleaning on fan grilles in the FGB (TsV2) and SM (VPkhO, VPrK, FS5, FS6 & FS9) screens.

The CDR also checked up on the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem, gathering weekly data on total operating time & "On" durations for reporting to TsUP-Moscow. Afterwards, Volkov temporarily powered down the POTOK for the periodic cleaning of its pre-filter, using the vacuum cleaner with narrow-slit nozzle attachment.

At ~10:05am EDT the crewmembers conducted their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-Houston and TsUP-Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

In the Kibo JPM Laboratory, Greg Chamitoff supported ongoing Marangoni Surface

experimentation in the FPEF (Fluid Physics Experiment Facility), ground-commanded from the SSIPC (Space Station Integration & Promotion Center) at Tsukuba/Japan, by activating the MMA (Microgravity Measurement Apparatus) and its laptop (MLT), first powering up the MMA's NCU/RSU (Network Control Unit/ Remote Sensor Unit) set from the Ryutai rack's UDC (Utility DC to DC Converter), then turning on both NCU/RSU and MLT.

Afterwards, after a brief familiarization review of reference material plus a ground specialist tagup, Gregory began his selected four-hour VolSci (Voluntary Weekend Science) session with the payload SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellites). In support of this interesting experiment, flight controllers at 9:00am EDT activated the CDRA (Carbon Dioxide Removal Assembly), to be turned off after an extended run tonight at ~8:00pm. *[The SPHERES experiment is a test bed for the development and testing of formation flying and other multi-spacecraft control algorithms. Today's 11:40am-3:10pm session concentrates on the ability of a single crewperson to deploy three satellites in two modes: "Position Hold" and "Closed Loop delta-V Control". SPHERES, done first by FE-1 Jeff Williams on Expedition 13, serves to mature autonomous satellite formation flight, rendezvous and docking algorithms in a long duration, microgravity environment. Single-satellite experiments test new thrusting algorithms utilizing onboard accelerometers and gyroscopes to more accurately apply velocity commands; they also use a new technique to more accurately estimate velocity. The two-satellite experiments introduce new controllers and path planning tools for purpose of docking to a tumbling satellite. Formation flight experiments test initialization of a formation, and obstacle avoidance. These tests help to develop the concept of a "fractionated spacecraft," which uses a loose formation of small satellites to perform the tasks of a single large spacecraft. Greg set up the Work Area, dimmed GLAs (General Luminaire Assemblies), programmed & deployed the three gas-propelled satellites (orange, red, blue), with five beacons, and used two PD-100 camcorders for video capture. Per applicable Flight Rule, SPHERES operations have no CO_2 (Carbon Dioxide) output constraints if the CDRA (CO_2 Removal Assembly) is operating in dual-bed or single-bed mode. The experiment run was time-critical since Ku-band is required for real-time video downlink.]*

Chamitoff also filled out the regular FFQ (Food Frequency Questionnaire), his eleventh, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the*

previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]

At ~6:50am, Cosmonaut Kononenko had his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

At ~9:47am, the FE-2 powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, & power supply) and conducted, at 9:52am, a ham radio exchange with students and teachers at Schulhaus Feld 1 in Richterswil, Switzerland. Richterswil is situated at the lake of Zurich. Some of the approximately 11000 inhabitants of the township work in Zurich, about 30 kilometers away. Others are employed at one of the local firms or have jobs in the neighboring towns and villages. There are five schools and several kindergardens. Richterswil hosts its own museum and many different organizations such as sports clubs, a woman's club, a parent's organization, a theatre group, several choirs and more. At the school there are about 170 children aged 6 to 13 years, split up into eight classes (grades 1 to 6). Staff includes 15 teachers and 3 janitors. The school building includes a gym and a swimming hall, which is also used by the other schools in Richterswil. Questions to Greg were uplinked beforehand. *["Is this your first mission on the ISS?"; "What do you feel when the rocket takes off? Are you happy, scared or just excited?"; "Do you miss your family? Are you homesick?"; "Is it comfortable to live in zero gravity or do you like it better on Earth?"; "How are you feeling psychologically in Space?"; "What does it smell like inside the ISS?"; "Do you sleep well in your sleeping bag? Is it comfortable?"; "How do you wash or shower?"; "What do you eat and how do you prepare and cook your food?"; "Is it difficult to live so closely together? Do you have any rules to help you?"; "Are there any sounds in Space or is it quiet?"; "Can you see other planets from the ISS?".]*

Kononenko completed the routine daily servicing of the SOZh system (ECLSS/ Environment Control & Life Support System) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The station residents conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-

1). Later, Greg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Hurricane Gustav Update: MCC-Houston is at Level 4 (full team) since yesterday morning and continues preparations for the potential closure of JSC. Gustav's progress is being tracked, and JSC is planning on a tagup tonight at ~11:00pm EDT to determine the next course of action for Sunday. NASA's SSC (Stennis Space Center) are closed and MAF (Michoud Assembly Facility) will close at midnight tonight (except for essential personnel).

Weekly Science Update *(Expedition Seventeen -- Week 19*

3-D SPACE: In progress.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Measurements continue in FGB module.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-2/CGBA-5 (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus 5): Silicate Garden Hab Side 2 is complete and CGBA-5 has now been powered off awaiting its move to EXPRESS Rack 2 (ER2). The Hab along with other CSI-02 equipment will be removed and returned home on ULF2.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): EuTEF platform is nominal. -- DEBIE-2: IOPs (Instrument Operations Procedures) were performed successfully for 24 hrs duration from 8/22 to 8/26. Generic status: link error still in work; however a work-around allows for regular science data acquisition using an on-board Instrument Operations Procedure (IOP) (but not yet in conjunction with any FIPEX IOP). A final software patch, which will enhance the present instrument capabilities, is under finalization on the ground.-- DOSTEL: On-going science acquisition.-- EuTEMP: Currently inactive as planned.-- EVC: Currently no picture taking.-- EXPOSE: On-going science acquisition.-- FIPEX: IOPs) were performed from 8/27 until 8/29.-- MEDET: Continuous science acquisition.-- PLEGPAY: Currently in READY mode, no science data acquisition on-going.-- TRIBOLAB: The Ball-Bearing experiment #4 was paused on 8/27 for the DAM. After the DAM, TRIBOLAB was commanded again to Thermal Stabilization Mode (in order to restart the Ball-Bearing Experiment #4).-- MEDET: Continuous science acquisition.

FSL (Fluid Science Laboratory): FSL is nominal.

GEOFLOW: Science Run#1 and Run#2 were successfully downlinked and handed-over to science teams in Germany. “We have received very promising results for GEOFLOW so far!” After deletion of the FSL VMU (Fluid Science Laboratory Video Management Unit) hard-disk content, the Science Run#3 was successfully performed on 8/25. The temperature gradient set-point of 4.2K could not be reached (actual gradient showed 3.6K), but science team gave their go ahead to proceed. Run#3 data were successfully downlinked on 8/26). On 8/27, Science Run#4 had to be interrupted before its completion (9 out of 11 iterations completed) because the FSL Rack had to be readied and the FSL FCE (Facility Core Element) was locked prior to the DAM (Debris Avoidance Maneuver) at 12:11pm. Unfortunately, it was not possible to activate FSL Rack prior to crew wake up time, to create enough time margin to secure the full Run#4 processing. The actual temperature gradient is now much closer to the set-point value (6.1K vs 6.2K, respectively) after modification of the GEOFLOW hardware temperature regulation parameters. Run#4 data were downlinked on 8/28. Due to limited crew time for ESA, the FSL FCE will remain locked at least until after the Progress 30P docking planned on 9/12.

HDTV System Test DL (JAXA): This activity is now planned for next week (9/5).

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Planned.

Marangoni Experiment for ISS (JAXA Fluid Physics Experiment Facility): The first experiment cycle was completed successfully.

Micro-G Clay (JAXA EPO): The Clay figures were retrieved from the JPM wall on 8/28 and stowed for return on ULF2.

MISSE (Materials ISS Experiment): Ongoing.

Moon Photography from ISS (JAXA EPO): Complete.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-1/-2 (Nitric Oxide Analyzer, ESA): Complete.

NUTRITION w/REPOSITORY: In progress.

PADLES (Passive Dosimeter for Lifescience Experiment in Space): These continue to be exposed in JEM-PM and JLP until 15A.

PCRF (Protein Crystallization Research Facility) Reconfiguration (JAXA): The PCRF reconfiguration was completed nominally on 8/28.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems):

Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): *"*Greg, you have almost completed all of the planned test points for SHERE. We thank you very much for all the fantastic science you have given us and all your hard work. You have given us science far beyond the original plan, and your results have sparked much discussion and excitement among the team. Thank you! We will send you more results as we analyze the data, and we hope to work with you again soon."

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): "Greg, next week you will have your next Sleep download activity. The Support team may or may not be verifying the file in between the download and initialization, based on whether hurricane Gustav decides to make an appearance. We are also working to start your next week of Sleep logging later in the week. Thanks for your participation."

SOLAR (Solar Monitoring Observatory): With the Sun observation duration per orbit reaching its maximum (20 min), SOLAR has been put in Sun Pointing Mode at around 8/28, 4:20pm EDT. The first Criss-Cross maneuver was successfully performed on 8/29.-- SOVIM: Acquiring science;-- SOLSPEC: Acquiring science; -- SOLACES: Acquiring science.

SOLO: Planned.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): On 8/22, the BIOLAB Rotor A bellow test was performed by ground commanding. Unfortunately this test was not successful, as 4 out of the 6 Reference ECs (Experiment Containers) gave faulty results. Teams on ground are assessing the impact to the planned recovery activities

CEO (Crew Earth Observations): Through 8/26 the ground has received a total of 5,220 frames of CEO images for review and cataloging. Photos acquired with times

corresponding to the CEO target list request times were reviewed first and this week included: the Toshka Lakes, Egypt (acquired-under review) and West Hawk Impact Crater, Manitoba (acquired-under review). "We are pleased to report that your excellent imagery of Tunis, Tunisia satisfies our increment requirements for this target and we can strike it from our list. The composition and focus of your images continues to show much improvement. However, more effort is needed on improving your mapping technique (i.e. overlap of successive frames). Many of our targets have this requirement because of their size and the level of detail needed. Please keep in mind that sufficient overlap is especially important in long-lens sessions where center-point jumps (random walk views) either leave the target incomplete or acquire imagery that is difficult to impossible to locate. Your recent, detailed view of the Aeolian Islands off the north coast of Sicily will be published on NASA/GSFC's Earth Observatory website this weekend. It provides excellent detail and context of the variety of volcanic structures present on these small Mediterranean islands. Nice shot!"

CEO (Crew Earth Observations) photo targets uplinked for today were **Algerian megafan** *(a mapping swath was requested along this ideally located track. If Greg shot for 60 secs after crossing the prominent dune field just uptrack, he will have acquired significant portions of the target [overlapping images are important for researchers to be able to identify the area covered in these long-lens images]),* and **Hurricane Gustav, Caribbean** *(by the time of this pass Gustav will have strengthened to a Category 2 (and possibly 3) storm now that it is over warm water).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 20 Scheduled Main Activities:

- Sun. (8/31): Station cleaning (USOS); WINSCAT; PFC (FE-2).
- Mon. (9/1, Labor Day): Crew off duty; Progress 29P Undock (~3:47pm); CSA-CP probe replacement; ham session; FSL/FCE lock.
- Tue. (9/2): ATV Undock OBT; BUAP/MBRL (PCE) equipment install in SM (ATV hand controller, antenna switch box, prox comm unit); Elektron deact/act; Vozdukh AVK test; FGB PS1/PS2 filter & TsV1 screen cleaning; USOS water sampling; CMO profic.train.; FSL/FCE release.
- Wed. (9/3): MO-7 (all); RED inspection; BMP ch.1 regen; MO-3/FE-1 (TVIS); WRS O_2 purge/port install/leak check; SAMS s/w load; CGSE troubleshooting; BRTK-MBRL (PCE) test 1.
- Thu. (9/4): SOTR-KOB1 maintenance; SRVK-BRPK maintenance; BMP ch.2 regen; CWC audit; SLEEP init.; PCS s/w load-ghosting; IWIS reprogram;

ATV: activate/SSVP docking system remove/close hatches/take photo+video; TVS-MPEG Ku-band test.

ISS Orbit (as of this morning, 8:55am EDT [= epoch]):
Mean altitude -- 353.6 km
Apogee height -- 358.3 km
Perigee height -- 349.0 km
Period -- 91.61 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006895
Solar Beta Angle -- -8.0 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 48 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56023

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/01/08 -- Progress M-64/29P undocking, FGB nadir (~3:47pm); independent flight w/"Plasma" exp.
09/05/08 -- ATV1 undocking, from SM aft port (~5:27pm); independent flight
09/09/08 -- Progress M-64/29P de-orbit (~5:19pm)
09/10/08 -- Progress M-65/30P launch (~3:49:45pm)
09/12/08 -- Progress M-65/30P docking (SM aft, ~5:08pm DM)
09/29/08 -- ATV de-orbit (nighttime re-entry for observation)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) or 10/24?
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch

03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/29/08
Date:	Friday, August 29, 2008 1:10:05 PM
Attachments:	

ISS On-Orbit Status 08/29/08

All ISS systems continue to function nominally, except those noted previously or below.

Before breakfast and exercise, FE-2 Chamitoff performed his second PHS (Periodic Health Status) w/Blood Labs examination, using the U.S. PCBA (Portable Clinical Blood Analyzer). The second part of PHS, Subjective Clinical Evaluation, was performed later in the day. CDR Volkov assisted in the assessment as CMO (Crew Medical Officer). All data were then logged on the MEC (Medical Equipment Computer) and the hardware stowed. *[The PHS exam, with PCBA analysis and clinical evaluation, is guided by special software (IFEP, In-Flight Examination Program) on the MEC laptop. While PCBA analyzes total blood composition, the blood's hematocrit is particularly measured by the Russian MO-10 protocol.]*

Sergey Volkov serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out"-to-vacuum cycle on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~5:15pm EDT. Filter bed #1 was regenerated yesterday. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time: 8/11 & 12).]*

FE-1 Kononenko took the periodic readings of potentially harmful atmospheric contaminants in the SM (Service Module), using the CMS (Countermeasure System), a component of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, which uses preprogrammed microchips to measure H_2CO (Formaldehyde, methanal), CO (Carbon Monoxide) and NH_3 (Ammonia), taking one measurement per microchip.

The CDR had several hours set aside for preparing the Progress-364/29P spacecraft for its undocking. To get the uncrewed cargo ship ready for departure, Volkov –

- Dismantled and removed the electronic LKT local temperature sensor commutator (TA251MB) of the BITS2-12 onboard telemetry measurement system and its PZU-1M ROM (read-only memory) unit from inside the ship for recycling,
- Salvaged a good two-light SD1-7 lighting fixture from 29P and replaced it with a failed (one-light) SD1-7 from ZIP stowage,
- Worked with Oleg Kononenko in the spacecraft to finish packing and tying down trash and excess cargo while logging moves in the IMS (Inventory Management System),
- Activated 29P and tore down the ventilation air duct to the FGB,
- Closed FGB-to-Progress transfer hatches (~2:00pm), and
- Started the usual one-hour hatch leak check on the connecting vestibule.

[Undocking is scheduled for ~3:47pm EDT on 9/1 (Monday). Progress 364 will remain in orbit on independent flight to conduct a "Plasma" experiment. Destructive reentry over the Pacific Ocean is scheduled for 9/9 (deorbit ~5:15pm).]

Chamitoff and Kononenko finished up on ATV (Automated Transfer Vehicle) cargo transfers and undock preparations. *[Documentary photography & video of the stowage arrangement are being examined on the ground for last-minute adjustments to ensure proper containment of all items and good CG (center-of-gravity) position for stable maneuvering during independent flight after undocking. "Jules Verne" is scheduled to de-orbit on 9/29 for a nighttime return timed for observing the fiery reentry and destruction from a high-flying observation plane and the ground.]*

The FE-1 completed another radiation data checkup for accumulated flux & dose rate data with the Matryoshka-R radiation payload (RBO-3-2) and its LULIN-5 electronics box.

Oleg also took the periodic photographs of the plants growing in the BIO-5 Rasteniya-2 ("Plants-2") Lada-13 greenhouse, using the Nikon D2X photo camera with F=17-55 mm lens, then downlinked the images via BSR-TM. The regular status check of the payload which researches growth and development of plants (barley) under spaceflight conditions was also conducted.

Afterwards, Kononenko continued preparations for the upcoming installation of ATV proximity ops control equipment by readying panels 226 & 227 in the SM for the outfitting and tagging up with ground specialists. *[The outfitting involved a remote hand controller with its stand, a BUAP antenna switch box with cabling and the PCE (Proximity Communications Equipment; Russian: MBRL) unit.]*

Meanwhile, Gregory spent several hours collecting fluid samples from ITCS (Internal Thermal Control System) loops in the

- JAXA Kibo module: one NH_3 (ammonia) sample from the LTL (Low Temperature Loop),
- U.S. Lab: a Triol return-to-ground sample plus an OPA (Ortho-Phthalaldehyde) sample,
- Node-2: an OPA or NH_3 sample from LTL and MTL (Moderate Temperature Loop) each,
- Columbus Laboratory: a Triol return-to-ground return and one NH_3 sample from MTL.

[Collecting and on-orbit analyzing (for ppm) of fluid specimen are done with a standard ITCS Sampling Adapter. Some samples will be returned to ground for analysis.]

Chamitoff also configured and recharged three PDAs (Personal Digital Assistant) units (via dual-USB cables) in preparation for their loading with new BCR (Bar Code Reader) and WINS (Windows Internet Name Service) software next week. *[WINS is Microsoft's implementation of NetBIOS Name Service (NBNS), a name server and service for NetBIOS computer names (equivalent to what DNS is to domain names).]*

The FE-2 conducted the regular bi-monthly reboot of the OCA Router and File Server SSC (Station Support Computer) laptops.

Greg took measurements for the regular atmospheric status check for $ppCO_2$ (Carbon Dioxide partial pressure) in the Lab, SM at panel 449 and COL (Columbus Orbital Laboratory) plus battery ticks, using the hand-held CDMK (CO_2 Monitoring Kit, #1002). The unit was then deactivated and returned to its stowage location (LAB1S2). *[Purpose of the 5-min activity is to trend with MCA (Major Constituents Analyzer), i.e., to correlate the hand-held readings with MCA measurements.]*

In the U.S. Lab, Oleg Kononenko performed a controlled shut-down of the EHS VOA (Environmental Health System-Volatile Organic Analyzer), with the ground power-cycling its RPC (Remote Power Controller).

The FE-1 also completed the routine daily servicing of the SOZh system (ECLSS/ Environment Control & Life Support System) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Afterwards, Oleg took care of the daily IMS maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The station residents conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Sergey will transfer the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~4:45am EDT, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU/*Glavnaya operativnaya gruppa upravleniya* = *“Main Operative Control Group”*), including Shift Flight Director (SRP), at TsUP-Moscow via S-band/audio, phone-patched from Houston and Moscow.

At ~5:00am, Sergey & Oleg linked up with TsUP stowage specialists via S-band to conduct the weekly IMS tagup, discussing inventory & stowage issues, equipment locations and ATV & Progress cargo transfers.

At ~2:55pm, the ISS crew will have their regular weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC (Station Support Computer)]*.

As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control ppCO_2 levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS (Internal Thermal Control System) cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking.]*

WRM Update: An updated WRM (Water Recovery Management) “cue card” was uplinked overnight for the crew’s reference, updated with yesterday’s water audit. *[The new card (17-0002X) lists 31 CWCs (~1163.8 L total) for the four types of water identified on board: technical water (385.0 L, for flushing only because of* Wautersia *bacteria), potable water (706.7 L, incl. 174.6 L currently on hold), condensate water (54.1 L), waste/EMU dump and other (17 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

MT Translation Update: Today at ~3:10pm-4:40pm EDT, ground commanding will move the Mobile Transporter from WS-6 (Worksite 6) to WS-7 using string-A IMCAs (Integrated Motor/Controller Assemblies) to provide added MMOD (Micrometeoroid/ Orbital Debris) protection of the TUS (Trailing Umbilical System) cable. During the move, Russian thrusters will be inhibited (2:55pm-5:55pm) due to loads constraints.

Conjunction Update: The conjunction with another Kosmos-2421 piece (#33248) tonight at 9:09pm EDT will not require a DAM (Debris Avoidance Maneuver). Based on more tracking, the object's trajectory is quite stable, with a predicted miss distance of 20.789 km, yielding a collision probability of 3.84E-10 (i.e., odds ~1:2,600,000,000), which moves the conjunction way out of the Red box (threshold 1:10,000).

Tropical Storm Gustav Update: In response to TS Gustav, JSC/Houston has transitioned to Level 4. As currently expected, the Center will go to Level 3 not earlier than Saturday evening, 8/30. Level 2 (Center Shutdown & relocation of the BCC/Backup Control Center deploy team to MSFC/Huntsville) would follow on Sunday evening unless changes in storm track, condition or speed alter this timeline. Gustav's landfall is still expected to be early on Tuesday morning, 9/2, somewhere on the Texas/Louisiana coast.

CEO (Crew Earth Observations) photo targets uplinked for today were **Cairo, Egypt** *(aiming at nadir and a touch left, and shooting margins of this rapidly expanding megalopolis on both banks of the Nile River in the green floodplain. Pyramids can be seen just west of the floodplain in the light-toned desert),* **South Tibesti Megafans, Chad** *(Greg was asked to shoot a swath of overlapping images just right of track. Two larger rivers from the Tibesti Mountains used to flow out onto the light-toned plains spreading enormous cones of sediment. The remnants of such cones in this target appear to be a good analog for the arid plains of Mars. Greg's visual cue was the light-toned plains directly at the foot of the black lava slopes of the Tibesti Mts.),* **Yellowstone National Park, Wyoming** *(detailed overlapping images just right of track were requested to document various features within the National Park, especially trails and remote roads that are best mapped from above),* and **Hurricane Gustav, Caribbean** *(Gustav has restrengthened into a Category 1 storm south off Cuba by the time of this pass [1:19pm EDT])*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 19/20 Scheduled Main Activities:

- Sat. (8/30): Station cleaning (RS); PFCs (CDR, FE-1); VolSci (SPHERES);

FFQ; Ham pass.

- Sun. (8/31): Station cleaning (USOS); WINSCAT; PFC (FE-2).
- Mon. (9/1, Labor Day): Crew off duty; Progress 29P Undock (~3:47pm); CSA-CP probe replacement; ham session; FSL/FCE lock.
- Tue. (9/2): ATV Undock OBT; BUAP/MBRL (PCE) equipment install in SM (ATV hand controller, antenna switch box, prox comm unit); Elektron deact/act; Vozdukh AVK test; FGB PS1/PS2 filter & TsV1 screen cleaning; USOS water sampling; CMO profic.train.; FSL/FCE release.
- Wed. (9/3): MO-7 (all); RED inspection; BMP ch.1 regen; MO-3/FE-1 (TVIS); WRS O_2 purge/port install/leak check; SAMS s/w load; CGSE troubleshooting; BRTK-MBRL (PCE) test 1.
- Thu. (9/4): SOTR-KOB1 maintenance; SRVK-BRPK maintenance; BMP ch.2 regen; CWC audit; SLEEP init.; PCS s/w load-ghosting; IWIS reprogram; ATV: activate/SSVP docking system remove/close hatches/take photo+video; TVS-MPEG Ku test.

ISS Orbit (as of this morning, 8:33am EDT [= epoch]):
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Perigee height -- 349.1 km
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Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006797
Solar Beta Angle -- -12.2 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 71 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 56007

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/01/08 -- Progress M-64/29P undocking, FGB nadir (~3:47pm); independent flight w/"Plasma" exp.
09/05/08 -- ATV1 undocking, from SM aft port (~5:27pm); independent flight
09/09/08 -- Progress M-64/29P de-orbit (~5:19pm)
09/10/08 -- Progress M-65/30P launch (~3:49:45pm)
09/12/08 -- Progress M-65/30P docking (SM aft, ~5:08pm DM)
09/29/08 -- ATV de-orbit (nighttime re-entry for observation)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) or 10/24?

11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/28/08
Date:	Thursday, August 28, 2008 1:18:04 PM
Attachments:	

ISS On-Orbit Status 08/28/08

All ISS systems continue to function nominally, except those noted previously or below.

Upon wake-up, CDR Volkov terminated his ninth MBI-12 SONOKARD experiment session for the long-term Russian sleep study, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

Volkov also performed the periodic service of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The process will be terminated at ~5:15pm EDT and Bed #2 regeneration performed tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time: 8/11 & 12)];*

After completing sampling of condensate water (KAV) from the SRVK-2M condensate processor upstream of the FGS gas-liquid mixture filter in drink bags, FE-1 Kononenko removed the processor's BKO multifiltration unit and replaced it with a spare, stowing the old unit for deorbiting on Progress 29P. *[BKO contains five purification columns to rid the condensate of dissolved mineral and organic impurities. It has a service lifetime of ~450 liters throughput. The water needs to be*

purified for proper electrolysis in the Elektron O_2 generator.]

Sergey Volkov conducted an inspection and photo-documentation of currently sunlit window panes in the RS (Russian Segment), specifically on windows 2 & 13 in the SM (Service Module) and VL1 (EV hatch 1) and VL2 (EV hatch 2) in the DC1 Docking Compartment. The observed defects were recorded in image and text files on the RSK1 laptop for subsequent downlink via U.S. OCA assets. *[Objective of the inspection, which uses a digital still camera (Nikon D1X w/SB-28DX flash) and voice recorder, was to assess the window pane surfaces for any changes (new cavities, scratches, new or expanded old stains or discolorations affecting transparency properties) since the last inspection. The new assessment will be compared to earlier observations. Defects on the currently are measured with the parallax method which uses eyeball-sighting with a ruler and a right isosceles triangle to determine the defects' size and position with respect to the window's internal surface (parallax being the apparent change in an object's position resulting from changing the observer's position).]*

In the FGB module, Volkov worked on the BR-9TsU-8 Radiotelemetry System (RTS), supporting the ground with another verification of the proper functioning of two temperature sensors (T97, T98) of the SIT-9L Temperature Measuring System.

Oleg Kononenko worked on the SM toilet systems (ASU), performing the monthly 30-min. maintenance/servicing of the facility, changing out replaceable ASU parts with new components, i.e., the urine receptacle (MP) and a filter insert (F-V). The old parts were discarded as trash.

Afterwards, the FE-1 had an hour in the FGB to search for and gather the necessary gear for the upcoming installation of ATV (Automated Transfer Vehicle) control equipment in the SM, i.e., an ATV hand controller with its stand, a BUAP antenna switch box with cabling and the PCE (Proximity Communications Equipment; Russian: MBRL) unit.

In the JAXA Kibo laboratory, Chamitoff powered down the MMA NCU/RSU (Microgravity Measurement Apparatus Network Control Unit/Remote Sensor Unit) at the Ryutai rack UDC (Utility DC-to-DC Converter) unit, without turning off the MLT (MMA Laptop Terminal) and its software. *[These systems were powered up by Greg on 8/19.]*

Also in the JPM (JEM Pressurized Module), Gregory had 1:15 h to reconfigure the PCRF (Protein Crystallization Research Facility).

After the recent (8/11) first Japanese payload activity in Kibo, an EPO (Educational

Payload Operation) experiment to model a piece of clay into a human-shaped form in micro-G, Gregory today prepared the clay form for return to Earth, packing it up carefully to protect it against breakage.

Pursuant to the discovery of a blacked out display on the CB (Clean Bench) subrack facility in the JPM during yesterday's Saibo CB checkout, Chamitoff today supported ground-commanded troubleshooting of the display by verifying cable connectivity (two cables, four plugs) and looking for possible bent connector pins. *[Ground commanding of JPM payloads is done by JAXA's SSIPC (Space Station Integration & Promotion Center) at Tsukuba/Japan. The CB provides a germ-free environment for life science and biotechnological experiments. It has a specially designed microscope that operates with bright-field, phase-contrast and fluorescence modes. The objective lens can be switched between four magnification levels (4x, 10x, 20x, 40x).]*

In the Lab, the FE-2 continued outfitting for the future U.S. Regenerative ECLSS (Environment Control & Life Support System) with the Modification Kit #1, Part 2. *[The work included installation of the OGS (Oxygen Generator System) secondary power jumper on its Utility Interface Panel (UIP, i.e., Z-panel LAB1PD1), connecting a MIL-Standard 1553 data bus for the WRS (Water Recovery System) on the PD2 Z-panel and retrieving equipment from stowage in the P1 volume.]*

FE-1 Kononenko had another ~3 hrs set aside for finishing up ATV cargo transfer activities and preparing the "Jules Verne" contents for ATV undocking next week (9/5).

At the TVIS treadmill, Kononenko did another inspection and documentary photography of the improvised patch of the running belt and four shifted belt plates above the patch for ground verification of belt integrity after its improvised repair conducted on 8/11.

The FE-2 completed the weekly 10-min. CWC (Contingency Water Container) inventory as part of on-going WRM (Water Recovery & Management) assessment of onboard water supplies. Updated "cue cards" based on the crew's water calldowns are sent up every other week. *[The new card (17-0002W) lists 31 CWCs (~1204.3 L total) for the four types of water identified on board: technical water (426.5 L, for flushing only because of* Wautersia *bacteria), potable water (706.7 L, incl. 174.6 L currently on hold), condensate water (54.1 L), waste/EMU dump and other (17 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

Gregory worked on the failed SSC-1 (Station Support Computer 1) laptop, replacing

its defunct shell ((#1098; failed backlight) with an A31p shell (#1173) from stowage and equipping it with the HDD (hard disk drive) of the failed laptop, making #1173 the new SSC-1.

Sergey Volkov was scheduled to initiate, later terminate, an oxygen refresh of the cabin atmosphere with O_2 from Progress M-64/29P stores.

The CDR performed the routine daily servicing of the SOZh system (ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Afterwards, Sergey took care of the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Later today (~2:00pm), Greg Chamitoff will break out and set up the equipment for tomorrow's scheduled U.S. PHS (Periodic Health Status) w/Blood Labs exam, a clinical evaluation of Chamitoff as subject, with Sergey Volkov assisting as CMO (Crew Medical Officer) for the blood sampling part. *[The task today included an electronic function test and control analysis of the blood lab equipment, viz., the PCBA (Portable Clinical Blood Analyzer), which was then temporarily stowed.]*

The station residents conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Sergey will transfer the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~9:35am EDT, Greg Chamitoff supported an interactive PAO TV event of ~20 min. with students from Sydney Girls High School at Australian Broadcasting Corporation's "Catalyst" Science Program of the Royal Botanic Gardens "Seeds in Space" Project, Sydney, Australia.

Conjunction Update: Using ATV thrusters, the ISS performed a 1 m/s braking burn yesterday at 12:11pm EDT to remove the risk of collision with an orbital object,-#33246 (part of the Kosmos-2421 satellite). The retrograde firing of 5 min 2 sec duration resulted in a mean altitude loss of ~1.77 km. Propellant usage: ~98 kg of

ATV prop, leaving ~190 kg in "Jules Verne" prior to undock (possibly with some margin, to be assessed by ESA) and ~320 kg of Progress/SM props for attitude control of the stack. A **second possible conjunction** with another piece (#33248) of Kosmos-2421 has been identified for tomorrow (8/29) at 9:09pm EDT, currently predicted to be in the RED box. This would require another DAM (Debris Avoidance Maneuver), but more tracking is required for a burn decision. Estimated prime TIG (Time of Ignition): tomorrow 7:00pm. Prop strategy is currently under study. If a second DAM is necessary tomorrow, using ATV prop, the Progress 29P undocking on 9/1 (Monday) can be supported by SM thrusters. Ballistic calculations must continue to account for future Soyuz launch, Soyuz landing and Shuttle ULF2 launch/rendezvous constraints.

Tropical Storm Gustav Update: Gustav is approaching Jamaica, with a hurricane warning already issued for the island. JSC/Houston is currently in the potential zone for Hurricane Gustav. Predictions for the 5-day timeline still have significant uncertainty. JSC will go to Level 4 if the storm threatens within 72 hours. Landfall is currently predicted to be on Tuesday, 9/2.

CEO (Crew Earth Observations) photo target uplinked for today was **Gordion archaeological site, Turkey** *(looking left. Visual cues were a man-made lake and narrow wooded [green] ridges. Broad images of the area were requested to assist future focused imaging efforts),* **Algerian megafan** *(detailed overlapping images were requested along track and just right of track, of this newly identified feature. During wet phases in the Sahara Desert one major river repeatedly built up this large "cone" of river sediment. Of special interest is the apex zone where the sediment cone has partly engulfed several hills [dark spots within fan margin]. This process of sediment burial of hills is providing a new analog for landscape models on Mars [where "hills" are impact crater rims]),* **Hurricane Gustav, Caribbean** *(interacting with the mountains of Hispaniola, Gustav has declined to a tropical storm, but is expected to intensify again to hurricane status by the time of this pass. The center was predicted to lie between Jamaica and Cuba),* and **Beni River dynamics, Bolivia** *(the Beni River transports great quantities of sediment from the Andes Mts and deposits it as a vast fan [450 km in radius] in SW Amazonia. The river has swept across the entire surface of the fan in the process. Shooting right to obtain images of numerous prior river courses)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 19/20 Scheduled Main Activities:

- Fri. (8/29): BMP ch.2 regen; PHS w/blood (PCBA); 29P: LKT remove/

activate/hatch close/leak check; BRTK-MBRL prox.comm. prep; ITCS fluid sampling (JEM, Lab, Node-2, COL); OCA & FS laptop reboots.

- Sat. (8/30): Station cleaning (RS); PFCs (CDR, FE-1); VolSci (SPHERES); FFQ; Ham pass.
- Sun. (8/31): Station cleaning (USOS); WINSCAT; PFC (FE-2).
- Mon. (9/1, Labor Day): Crew off duty; Progress 29P Undock (~3:47pm); CSA-CP probe replacement; ham session; FSL/FCE lock.
- Tue. (9/2): ATV Undock OBT; BUAP/MBRL (PCE) equipment install in SM (ATV hand controller, antenna switch box, prox comm unit); Elektron deact/act; Vozdukh AVK test; FGB PS1/PS2 filter & TsV1 screen cleaning; USOS water sampling; CMO profic.train.; FSL/FCE release.

ISS Orbit (as of this morning, 8:05am EDT [= epoch]):
Mean altitude -- 353.8 km
Apogee height -- 358.1 km
Perigee height -- 349.4 km
Period -- 91.61 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006422
Solar Beta Angle -- -16.3 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.72
Mean altitude loss in the last 24 hours -- 1770 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55991

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/01/08 -- Progress M-64/29P undocking, FGB nadir (~3:47pm); independent flight w/"Plasma" exp.
09/05/08 -- ATV1 undocking, from SM aft port (~5:27pm); independent flight
09/09/08 -- Progress M-64/29P de-orbit (~5:19pm)
09/10/08 -- Progress M-65/30P launch (~3:49:45pm)
09/12/08 -- Progress M-65/30P docking (SM aft, ~5:08pm DM)
09/29/08 -- ATV de-orbit (nighttime re-entry for observation)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft)
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10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) or 10/24?
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit

11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/27/08
Date:	Wednesday, August 27, 2008 2:47:17 PM
Attachments:	

ISS On-Orbit Status 08/27/08

All ISS systems continue to function nominally, except those noted previously or below. *Today five years ago (2003), the planet Mars made its closest approach to Earth in nearly 60,000 years: 55,758,006 km (34,646,419 mi).*

Conjunction event: Using ATV thrusters, the ISS performed a DAM (Debris Avoidance Maneuver) burn at 12:11pm EDT (in lieu of the IWIS Thruster Firing Test originally planned) to remove the risk of collision with an orbital object,- #33246 (part of the Kosmos-2421 satellite). *[Miss distance of the object, tracked over several days, was predicted this morning to be 1.627 km, with a collision probability of 0.0139 (odds 1:72) which brought it over the ruled threshold into the RED box (FR B4-101, i.e.," greater than 1 in 10,000"), requiring a DAM. The burn, calculated to last 5 min 2sec, was performed with two thrusters of the ATV main propulsion system. Predicted delta-V was ~1 m/s, in retrograde direction, so that future Soyuz launch, Soyuz landing and Shuttle ULF2 launch constraints can be met. An automated timer-controlled confirmation check by the RS CCS (Command & Control System) software of the transition to the proper system configuration for the thruster burn did not take place and had to be done manually by MCC-H Flight Control in time for the burn. Note: The last DAM was performed on 5/30/03.]*

Upon wake-up, FE-1 Kononenko terminated his ninth MBI-12 SONOKARD experiment session for the long-term Russian sleep study, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. Sergey Volkov's new MBI-12 session starts tonight (~5:20pm). *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

In preparation for the ATV DAM burn at 12:11pm, FE-2 Chamitoff closed the protective shutters on the Lab science window, having verified shutter closure for the JPM (JEM Pressurized Module) window yesterday.

Also for the DAM, the FE-2 locked the FSL FCE (Fluid Science Laboratory/Facility Core Element) in the COL (Columbus Orbital Laboratory) with four locking bolts to fix it for the acceleration forces caused by the thrusters. *[The locking activity had to wait until after a ground-commanded GEOFLOW Single Experiment run in the FSL, ending at ~11:15am.]*

The originally scheduled installation of the IWIS (Internal Wireless Instrumentation System) and the periodic OBT (Onboard Training) Fire Emergency Drill by the crew were not conducted because of the concurrently scheduled DAM.

After turning on the four Pille dosimeters of the LULIN-ISS radiation complex on 8/21 to start data taking, Kononenko downlinked the post-exposure readings of each dosimeter and then deactivated the LULIN BUI Control & Measuring Unit, leaving the electrical connections in place.

Gregory was to use the electronic Velocicalc instrument to take the periodic THC IMV (Temperature & Humidity Control/Intermodule Ventilation) air flow measurements of relative humidity (dew point, wet bulb temp), temperature and air velocity (flow rate) between modules, but the activity was aborted due to false Velocicalc readings. *[The instrument was reading negative in the high 100's (ft/m) and did not vary when moved across the diffuser. Specialists are investigating the anomalous Velocicalc performance. The IMV flow measurements are used to determine when duct cleaning should be performed.]*

Oleg conducted the periodic checkout/verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the passageways SM PrK (Service Module Transfer Compartment)–ATV, PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1.

More water samples were gathered by Kononenko in the RS, today from the BRP-M Water Distribution & Heating Unit (hot tap). The samples were stored in drinking bags and a sample container for return to the ground.

In the JAXA Kibo JPM, the FE-2 supported the Tsukuba flight controllers by verifying a ground-commanded checkout of the CB (Clean Bench) subrack facility (except its microscope). Video of the checkout was downlinked through VCU (Video Control Unit) and IPU (Image Processing Unit).

Greg performed the periodic maintenance of the CEVIS cycle ergometer, lubricating its guide pins and making sure that the exercise machine can still be rotated out of the way to the stowed position.

The CDR had 2 hrs set aside to perform the periodic Russian SPOPT (Fire Detection & Suppression System) maintenance in the DC1 “Pirs” Docking Compartment by dismantling its three IDZ-2 smoke detectors, cleaning their ionizing needles and then reinstalling the sensors. *[Part of the job is inspection and cleaning of surrounding areas behind panels.]*

Volkov, Kononenko & Chamitoff had another ~4:30 hrs reserved on today’s timeline between them for ATV cargo unloading/loading, i.e., moving consumables to the ISS via the SM and loading trash & excessed equipment on “Jules Verne”.

The FE-1 performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Afterwards, Oleg also took care of the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

As per the Russian voluntary “time permitting” task list, Kononenko conducted the regular status check on the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (barley) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}), recharging its water tank as required.

The station residents conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Oleg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

ER-4/ER-5 Relocation Update: During yesterday’s EXPRESS Rack 5 transfer, both the supply- and return-line QDs (Quick Disconnects) of the ITCS MTL (Internal

Thermal Control System/Moderate Temperature Loop) leaked some ITCS fluid (Triol, a water/glycerin mixture) upon disconnection. A 1.1% drop in accumulator quantity was observed, which equates to approximately 3-4 oz. of fluid. The return line leak was stopped. Since the supply side continued to leak despite prescribed QD leak troubleshooting, it was left connected to the Z-panel. ER-5 was relocated to the JPM but will remain unpowered until the ITCS jumper is installed. It is not scheduled for powered operations for several days. The supply line must be removed prior to the CHeCS (Crew Health Care Systems) rack relocation in two weeks. *[A "triol" is a chemical compound containing three hydroxyl groups (-OH), such as glycerol.]*

VolSci Preview: For next weekend's Voluntary Science program, Gregory has selected a 4-hr. session with the SPHERE (Synchronized Position Hold, Engage, Reorient, Experimental Satellites) payload, using all three satellites and requiring the CDRA to be running. Two additional candidate payloads were suggested for 8/31 (Sunday) & 9/1 (Monday, a holiday): (1) a LOCAD-PTS (Lab-On-A-Chip Application Development – Portable Test System) run, using Glucan LAL cartridges in COL (Columbus Orbital Laboratory) to look for fungus on surfaces, and (2) another SHERE (Shear History Extensional Rheology Experiment) session.

CEO (Crew Earth Observations) photo target uplinked for today was **Santorini Volcanic Complex, Greece** *(looking left at the tight circle of small islands nearest track for detailed images),* **Kwanza Basin, Angola** *(overlapping images along track at nadir were requested; handheld imagery is acting as baseline mapping data for expected new economic development in the Kwanza Basin as oil revenues from the coastal oilfields rise rapidly),* **Hurricane Gustav, Caribbean** *(Dynamic event. This hurricane is moving NW and expanding rapidly. It is expected to be a Category 2 storm centered just south of Cuba by the time of this ISS pass),* and **High Central Andean Glaciers** *(changes in glacier footprint are climate change indicators, and are ideally mapped by remote means. Tropical mountain glaciers are known to be melting fast in some areas. Looking roughly at nadir for bright white glaciers on mountain peaks [for ~2.5 minutes])*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 19/20 Scheduled Main Activities:

- Thu. (8/28): MBI-12/Sonokard (CDR); BMP ch.1 regen; Regen ECLSS Mod Kit 1 install; JAXA CB Microscope C/O; Clay EPO return; COL FSL FCE release; ATV cargo transfers; PHS w/blood set-up; ASU R&R; WRM audit.
- Fri. (8/29): BMP ch.2 regen; PHS w/blood (PCBA); 29P: LKT remove/

activate/hatch close/leak check; BRTK-MBRL prox.comm. prep; ITCS fluid sampling (JEM, Lab, Node-2, COL); OCA & FS laptop reboots.

- Sat. (8/30): Station cleaning (RS); PFCs (CDR, FE-1); VolSci (SPHERES); FFQ; Ham pass.
- Sun. (8/31): Station cleaning (USOS); WINSCAT; PFC (FE-2).
- Mon. (9/1, Labor Day): Crew off duty; Progress 29P Undock (~3:47pm); CSA-CP probe replacement; ham session; FSL/FCE lock.
- Tue. (9/2): ATV Undock OBT; BUAP/MBRL (PCE) equipment install in SM (ATV hand controller, antenna switch box, prox comm unit); Elektron deact/act; Vozdukh AVK test; FGB PS1/PS2 filter & TsV1 screen cleaning; USOS water sampling; CMO profic.train.; FSL/FCE release.

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/01/08 -- Progress M-64/29P undocking, FGB nadir (~3:47pm); independent flight w/"Plasma" exp.
09/05/08 -- ATV1 undocking, from SM aft port (~5:27pm); independent flight
09/09/08 -- Progress M-64/29P de-orbit (~5:19pm)
09/10/08 -- Progress M-65/30P launch (~3:49:45pm)
09/12/08 -- Progress M-65/30P docking (SM aft, ~5:08pm DM)
09/29/08 -- ATV de-orbit (nighttime re-entry for observation)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) or 10/24?
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking

04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/26/08
Date:	Tuesday, August 26, 2008 12:27:23 PM
Attachments:	

ISS On-Orbit Status 08/26/08

All ISS systems continue to function nominally, except those noted previously or below.

Today's main activity for the crew was to transfer two Lab racks to the JAXA JPM (JEM Pressurized Module) – ER4 (EXPRESS Rack 4) and ER5, as part of a larger move of nine U.S. racks to Kibo as per international agreement. For the transfer, Gregory Chamitoff, assisted by CDR Volkov, had to –

- Disconnect the two ELCs (ER laptop computers) and stow them temporarily with their cables & support equipment,
- Rotate the CEVIS ergometer bicycle 90 deg out of the way to its stowed position (after having performed his one-hour physical exercise on it),
- Relocate ER4 from LAB1P2 to Kibo position JPM1F5,
- Relocate ER5 from LAB1S4 to Kibo position JPM1F1,
- Mate ER4's umbilicals at the JPMF5 UIP (Utility Interface Panel, "Z-panel");
- Mate ER5's umbilicals at the JPM1F1 UIP ("Z-panel"),
- Set up & connect each ELC at its respective ER, and
- Restow any items temporarily relocated before the transfers to their original locations.

[The EXPRESS (EXpedite the PRocessing of Experiments to the Space Station) Racks are standardized payload rack systems that transport, store and support science payloads aboard the ISS in several disciplines such as biology, chemistry, physics, ecology and medicine, including commercial activities. Each ER is housed in an ISPR (International Standard Payload Rack) - a refrigerator-size container that acts as the ER's exterior shell. Each rack can be divided into segments, whether as large as half the entire rack or as small as a breadbox.]

Volkov used an early RGS (Russian Groundsite) comm pass (DO4/~2:27am EDT) to downlink a Fialka UVC (Ultraviolet Video Camera) recording from the geophysical GFI-1 Relaksatsiya ("relaxation") experiment session on 8/20, which took images and radiation patterns of the Earth atmosphere & surface from spectra recorded

with the UV camera from SM window #9. *[Relaksatsiya normally deals with the study of the chemoluminescent chemical reactions and atmospheric light phenomena (emissions, i.e., molecular relaxation processes), including those that occur during high-velocity interaction between the exhaust products from space vehicles and the atmosphere at orbital altitude and during the entry of space vehicles into the Earth's upper atmosphere. "Relaxation", in Physics, is the transition of an atom or molecule from a higher energy level to a lower one, emitting radiative energy in the process as equilibrium is achieved.]*

After temporarily deactivating the Russian SKV-2 air conditioner, FE-1 Kononenko collected another set of condensate water (KAV) samples from the SRV-K2M Condensate Water Recovery System, upstream of its FGS Gas-Liquid Mixture Filter, in an empty drinking bag for return to Earth.

As part of regular preventive maintenance of RS (Russian Segment) ventilation systems, the FE-1 used a vacuum cleaner and soft brush for cleaning the detachable VT7 fan screens 1, 2 & 3 of the three SOTR (Thermal Control System) gas-liquid heat exchangers (GZhT4) In the FGB (Funktsionalnyi-Grusovoi Blok).

Volkov, Kononenko & Chamitoff had another ~8:40 hrs reserved on today's timeline between them for ATV (Automated Transfer Vehicle) cargo unloading/loading, i. e., moving consumables to the ISS via the SM (Service Module) and loading trash & excessed equipment on "Jules Verne".

Yesterday's scheduled O_2 (oxygen) refresh of the cabin atmosphere from Progress M-64/29P stores was aborted and moved to today's schedule for the CDR.

The crew had their regular weekly PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Sergey at ~12:05pm, Oleg at ~1:20pm, Greg at ~2:30pm EDT.

The CDR performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Afterwards, Sergey also completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

In preparation for the IWIS (Internal Wireless Instrumentation System) thruster test

scheduled tomorrow evening (~6:12pm), Gregory verified closure of the protective window shutter of the JAXA JLP.

The station residents conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Volkov transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~5:20pm EDT, just before sleep time, the FE-1 will again set up the Russian MBI-12 SONOKARD (Sonocard) payload and start his ninth experiment session, using a sports shirt from the SONOKARD kit with a special device in the pocket for testing a new method for acquiring physiological data without using direct contact on the skin. Measurements are recorded on a data card for return to Earth. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control $ppCO_2$ levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS (Internal Thermal Control System) cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking.]*

WRS (Water Recovery System) Update: Yesterday's scheduled installation of the O_2 port on the PD4 standoff in the Lab and the relocation of the CHeCS (Crew Health Care System) O_2 supply hose to the new port, followed by an overnight leak check, could not be completed by the FE-2 when an adapter required for umbilical and port purging could not be located. The activity has been deferred until the missing equipment is located. *[The CHeCS rack will be relocated next week in the U.S. Lab from the D4 position to the S4 position in order to install the WRS-1 rack during STS-126/ULF2. Since there will be no O_2 connection to the CHeCS rack at the S4 location, the new O_2 port must be installed, also to interface with the*

Regenerative ECLSS system to maintain a functional O_2 port in the D4 bay of the Lab.]

HRM Update: When Kononenko's exercise HRM2 (Heart Rate Monitor 2) #1001 stopped working yesterday, it was replaced by the available spare (#1002), pending further troubleshooting of #1001. *[The wireless POLAR S810 HRMs resemble sports wrist watches, with some of their features. They display the heart rate as BPM (beats per minute) and % of HRmax, average HR plus exercise duration, along with 7 different exercise profiles. The HR is radioed by the HRM transmitter, worn on an elastic belt around the chest, to the wrist receiver for subsequent downloading to the MEC and analysis by special software. Receiver settings are also uploaded from the laptop.]*

VolSci Preview: For next weekend's Voluntary Science program, Gregory has selected a 4-hr. session with the SPHERE (Synchronized Position Hold, Engage, Reorient, Experimental Satellites) payload, using all three satellites and requiring the CDRA to be running. Two additional candidate payloads were suggested for 8/31 (Sunday) & 9/1 (Monday, a holiday): (1) a LOCAD-PTS (Lab-On-A-Chip Application Development – Portable Test System) run, using Glucan LAL cartridges in COL (Columbus Orbital Laboratory) to look for fungus on surfaces, and (2) another SHERE (Shear History Extensional Rheology Experiment) session.

CEO (Crew Earth Observations) photo target uplinked for today was **West Hawk Impact Crater, Manitoba** *(looking right from track, West Hawk crater was a more circular lake situated on the near side of a set of many elongated lakes. This 4.5 km-diameter crater was formed 350 million years ago, and is still evident in the landscape despite several episodes of glacial erosion in the last 2 million years).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 19 Scheduled Main Activities:

- Wed. (8/27): MBI-12/Sonokard (FE-1); ATV cargo transfers; LULIN data dwnld.; DC1 IDZ-2 smoke detector cleaning; THC-IMV flow meas.; SVO BRP-M water sampling; IWIS setup; Emergency proc. OBT/drill; IWIS thruster test.
- Thu. (8/28): MBI-12/Sonokard (CDR); BMP ch.1 regen; Regen ECLSS Mod Kit 1 install; JAXA CB Microscope C/O; Clay EPO return; COL FSL FCE release; ATV cargo transfers; PHS w/blood set-up; ASU R&R; WRM audit.
- Fri. (8/29): BMP ch.2 regen; PHS w/blood (PCBA); 29P: LKT remove/ activate/hatch close/leak check; BRTK-MBRL prox.comm. prep; ITCS fluid

sampling (JEM, Lab, Node-2, COL); OCA & FS laptop reboots.

- Sat. (8/30): Station cleaning (RS); PFCs (CDR, FE-1); VolSci (SPHERES); FFQ; Ham pass.
- Sun. (8/31): Station cleaning (USOS); WINSCAT; PFC (FE-2).

ISS Orbit (as of this morning, 8:35am EDT [= epoch]):
Mean altitude -- 355.6 km
Apogee height -- 361.5 km
Perigee height -- 349.6 km
Period -- 91.65 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0008817
Solar Beta Angle -- -23.8 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.71
Mean altitude loss in the last 24 hours -- 40 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55960

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
08/27/08 -- IWIS thruster test (~6:12pm)
09/01/08 -- Progress M-64/29P undocking, FGB nadir (~3:47pm); independent flight w/"Plasma" exp.
09/05/08 -- ATV1 undocking, from SM aft port (~5:27pm); independent flight
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09/10/08 -- Progress M-65/30P launch (~3:49:45pm)
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11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
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11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking

02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
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04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/25/08
Date:	Monday, August 25, 2008 1:13:05 PM
Attachments:	

ISS On-Orbit Status 08/25/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 19 of Increment 17.*

The crew got up an hour earlier this morning (1:00am EDT) to enable TORU testing over RGS (Russian Groundsite). Sleep time tonight will also begin an hour earlier (4:30pm), and end tomorrow at the regular time (2:00am).

For the purpose of testing the main TORU (Teleoperator Control System) receiver on the mated Progress M-64/29P, CDR Volkov & FE-1 Kononenko worked with ground specialists via VHF on DO3 (Daily Orbit 3, VHF coverage 2:15-2:22am) on the standard vehicle-to-vehicle TORU checkout between the Service Module (SM) and the Progress 29P cargo ship docked to the FGB nadir port. TORU was activated on 2:16am. Progress thrusters (DPO) were inhibited and not involved. *[Crew activities focused on TORU activation, inputting commands via the RUO Rotational Hand Controller and close-out ops. TORU lets an SM-based crewmember perform the approach and docking of automated Progress vehicles in case of failure of the automated KURS system. Receiving a video image of the approaching ISS, as seen from a Progress-mounted docking television camera ("Klest"), on a color monitor ("Simvol-Ts", i.e. "symbol center") which also displays an overlay of rendezvous data from the onboard digital computer, the crewmember steers the Progress to mechanical contact by means of two hand controllers, one for rotation (RUO), the other for translation (RUD), on adjustable armrests. The controller-generated commands are transmitted from the SM's TORU control panel to the Progress via VHF radio. In addition to the Simvol-Ts color monitor, range, range rate (approach velocity) and relative angular position data are displayed on the "Klest-M" video monitor (VKU) which starts picking up signals from Progress when it is still approximately 7 km away. TORU is monitored in real time from TsUP over Russian ground sites (RGS) and via Ku-band from Houston, but its control cannot be taken over from the ground.]*

FE-2 Chamitoff worked on reconditioning ITCS (Internal Thermal Control System) Flow Meter batteries, that is, charging them in the SMPA (SM Power Adapter) "Makita" battery charger through several cycles and checking charge level between cycles. *[The batteries have discharged due to a shelf-life issue and were unable to accept charge via nominal charging. The reconditioning required demating the battery (to reset its internal circuit) every hour, then remating it for more charging if necessary. The process included a confidence check, i.e., by determining how long a battery will power the Flow Meter when connected to it. The SMPA connects to the Russian power system with U.S. cables and transforms the Russian 28 volts direct current to 12VDC for the battery.]*

Kononenko conducted the periodic (about twice a month) replenishing of the Elektron oxygen generator's water supply for electrolysis, filling the KOV EDV container with water collected in a CWC (Contingency Water Container, #1021) from the Lab CCAA (Common Cabin Air Assembly) dehumidifier. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron shutdown.]*

Volkov & Kononenko had another ~5:45 hrs reserved between them for ATV cargo transfers, i.e., moving consumables to the ISS via the SM and loading trash & excessed equipment on "Jules Verne".

After the ATV D1 rack compartment was cleared of cargo items, the CDR performed a special deck inspection in the ESA freighter spacecraft to check on possible condensate and to measure shell temperature. Afterwards, Sergey & Oleg installed a TSR (Temporary Stowage Rack) in the D1 space and modified it to accept large trash items. *[The shell inspection was motivated by the shifting of several layers of MLI (Multi-Layer Insulation) during launch, exposing the hull in several locations without thermal insulation. The goal of the inspection and temperature measurements with the Scopemeter with thermal probe was to evaluate the impact(s) of the insulation loss for the future.]*

The FE-1 "harvested" plants grown in the long-term BIO-5 Rasteniya-2 ("Plants-2") micro-G growth payload, photographing and collecting barley seedlings and inserted them into a MELFI (Minus Eighty Degree Laboratory Freezer for the ISS) box module (Dewar 3/Tray A) for return to Earth. Oleg then planted two BIO-5 root modules with fresh Mizuna seeds (*Brassica juncea* var. *japonica,* Japanese Mustard Greens, also known as California Peppergrass). Working off his discretionary "time permitting" task list, Oleg additionally performed the daily status check of the hardware. *[Rasteniya researches growth and development of plants (currently Mizuna) under spaceflight conditions in the Lada-13 greenhouse. MELFI's cooling system is using the Reverse Brayton Thermodynamic Cycle with nitrogen as working fluid. The cooling engine, a Brayton Machine (BM), working*

with a compression wheel and expansion wheel on the same shaft supported by a gas bearings system, can rotate at speeds up to 96,000 rpm depending on the cooling requirements.]

In preparation for tomorrow's relocation of ER-4 (EXPRESS Rack 4) & ER-5 from the US Lab to the JAXA Kibo JPM (JEM Pressurized Module), Gregory made room for the transfers by clearing stowage from the future site of the racks in the JPM and prepared the translation path for "flying" the ERs over to Kibo. As an additional voluntary job on his "job jar" list, Greg also was to take photographs of any items protruding into the 50 in x 72 in. translation path needed for the various rack transfers.

Later, the three crewmembers reviewed tomorrow's transfer activities and also the upcoming cabling modification tasks on the Regenerative ECLSS (Environment Control & Life Support System) in the Lab. *[The ER rack transfers will involve only two of nine US rack relocations prior to STS-126/ULF2, with the remaining transfers scheduled in September, viz.: MELFI plus two ZSRs (Zero-G Stowage Racks) to Kibo, HRF-1 (Human Research Facility 1) & HRF-2 to COL (Columbus Orbital Laboratory), and CHeCS (Crew Health Care Systems) plus one RSR (Resupply Stowage Rack from Node-2) to Lab positions. The CHeCS rack transfer will lead over to completion of the Regenerative ECLSS modifications.]*

Chamitoff completed the retrieval of eight US grounding straps from the JLP (JEM Logistics Pressurized Section), originally scheduled 8/20 but then postponed. The straps will be required for tomorrow's rack relocations (four each for ER-4 & ER-5).

In the Lab, the FE-2 also performed corrective maintenance on the Avionics Rack 1 (LAB1D5), removing and replacing an RPCM (Remote Power Control Module). *[The RPCM (LAD52B-A) exhibited anomalous behavior some time ago, probably because of a FET (Field Effect Transistor) Hybrid failure in one of the RPCs, causing a spontaneous power on reset which switched the INT MDM (Interior Multiplexer/Demultiplexer) computer system from Primary INT-2 to INT-1 and thereby removed some heaters from RPC control.]*

CDR Volkov set up the IWIS (Internal Wireless Instrumentation System) and connected its NCU (Network Control Unit) to the SSC-4 (Station Support Computer 4) laptop to enable ground-commanded testing of the IWIS structural vibrations dynamics measuring & data recording system.

FE-1 Kononenko took care of the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV*

waste water and EDV-U urine containers.]

Oleg also completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Greg Chamitoff continued outfitting for the new Regenerative ECLSS, today working on its WRS (Water Recovery System) by installing the oxygen (O_2) port, venting the new CHeCS O_2 supply hose to prevent contamination, then relocating the umbilical to the new port, purging it and the CHeCS rack O_2 port and configuring the setup for an overnight leak check. *[The WRS will be used to recycle wastewater into potable water. The Regenerative ECLSS will be required for the future six-person occupancy of the station.]*

Sergey set up the Fialka-UVC hardware in preparation for downlinking the video recording from last Wednesday’s (8/20) session with the geophysical GFI-1 Relaksatsiya ("relaxation") experiment which took images and radiation patterns from the Earth atmosphere & surface from spectra recorded with the UV (ultraviolet) camera from SM window #9. The TV recording will be downlinked tomorrow on DO4. *[Relaksatsiya normally deals with the study of the chemoluminescent chemical reactions and atmospheric light phenomena (emissions, i.e., molecular relaxation processes), including those that occur during high-velocity interaction between the exhaust products from space vehicles and the atmosphere at orbital altitude and during the entry of space vehicles into the Earth's upper atmosphere.]*

The three station residents conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Volkov transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Sergey initiated, later terminated, an oxygen refresh of the cabin atmosphere with O_2 from Progress M-64/29P stores.

At ~12:35pm EDT, Dr. Chamitoff supported a live interactive PAO/Educational event of ~20 min with the Columbia Mission Project at Buchanan High School in Clovis, CA. This was the third annual Simulated Space Station Experience at that

location. The project involved a simulated total NASA experience, from rocket fabrication to astronaut selection, training in Mission Control, and station operations. The highlight was students spending 48 hours in mockups of the ISS and Mission Control for a space station mission. Questions from the K-12 students were uplinked to the crew beforehand. *["What inspired you to be an astronaut?"; "What was the greatest obstacle you had to overcome in your astronaut training? For example, did you have to overcome any fears?"; "What was the most interesting psychological test you experienced during the astronaut application process?"; "You revolutionized the game of chess and took a chess board into space. Have any of the Mission Control Centers been able to beat you?"; "Where you able to watch or follow the Beijing Olympics and what event do you think would be most fun in space?"]*

As generally every day now, today starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control $ppCO_2$ levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS (Internal Thermal Control System) cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking.]*

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 19 Scheduled Main Activities:

- Tue. (8/26): SRVK KAV sample; ATV cargo transfers; ER4/ER5 stow; ER4 relocate to JPM; ER5 relocate to JPM; ER4/ER5 umbillicals mate; ER4/ER5 restow.
- Wed. (8/27): MBI-12/Sonokard (FE-1); ATV cargo transfers; LULIN data dwnld.; DC1 IDZ-2 smoke detector cleaning; THC-IMV flow meas.; SVO BRP-M water sampling; IWIS setup; Emergency proc. OBT/drill; IWIS thruster test.
- Thu. (8/28): MBI-12/Sonokard (CDR); BMP ch.1 regen; Regen ECLSS Mod Kit 1 install; JAXA CB Microscope C/O; Clay EPO return; COL FSL FCE release; ATV cargo transfers; PHS w/blood set-up; ASU R&R; WRM audit.
- Fri. (8/29): BMP ch.2 regen; PHS w/blood (PCBA); 29P: LKT remove/ activate/hatch close/leak check; BRTK-MBRL prox.comm. prep; ITCS fluid sampling (JEM, Lab, Node-2, COL).

ISS Orbit (as of this morning, 8:30am EDT [= epoch]):
Mean altitude -- 355.6 km

Apogee height -- 361.6 km
Perigee height -- 349.6 km
Period -- 91.65 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0008866
Solar Beta Angle -- -27.2 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.71
Mean altitude loss in the last 24 hours -- 44 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55944

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/01/08 -- Progress M-64/29P undocking, from FGB nadir; de-orbit/re-entry ~9/8
09/05/08 -- ATV1 undocking, from SM aft port (loiter until 9/29 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) or 10/24?
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation

10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/24/08
Date:	Sunday, August 24, 2008 12:13:09 PM
Attachments:	

ISS On-Orbit Status 08/24/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – rest day for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff. Ahead: Week 19 of Increment 17.*

Sleep/Wake Cycle Change: Crew sleep begins an hour earlier tonight (4:30pm EDT) to accommodate tomorrow's TORU testing with a one-hour earlier wake-up (1:00am). Tomorrow evening, sleep will begin also earlier, at 4:30pm, and end at the regular time of 2:00am on Tuesday.

Gregory Chamitoff had three hours reserved for the regular weekly station cleaning in the USOS (US Segment) which wasn't scheduled yesterday alongside the RS (Russian Segment) "uborka" housecleaning by his two crewmates.

Oleg Kononenko serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out"-to-vacuum cycle on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~4:00pm EDT. Filter bed #1 was regenerated yesterday. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time: 8/11&12).]*

Sergey Volkov conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The CDR also checked up on the Russian POTOK-150MK (150 micron) decontamination filter unit of the SM's SOGS air revitalization subsystem, gathering weekly data on Total Operating Time & "On" durations for reporting to TsUP-Moscow.

Chamitoff completed the periodic relocation of the TEPC (Tissue Equivalent Proportional Counter), the primary radiation measurement tool in the ISS, from the SM starboard crew quarters (panel 449) to the JAXA JPM (JEM Pressurized Module) 1A5 location. *[The FE-2 also photo documented the current state of the TEPC power/data cable, then covered the peeling Kapton tape on the degraded cable with fresh tape to contain any FOD (Foreign Object/Debris). TEPC had been relocated to the SM by Greg on 6/24.]*

Working off the Russian discretionary "time permitting" task list, Kononenko performed the regular status check of the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

As time permitted, Oleg was also to conduct another run of the Russian DZZ-2 "Diatomeya" ocean observations program, using the NIKON-F5 DCS still camera with f85mm lens and the HDV camcorder from SM window #7 to record color field patterns in target water areas and current atmospheric conditions above them. *[Uplinked target zones in the Indian Ocean were the coastal area of Oman and the area west of Australia, and in the Atlantic Ocean Newfoundland Island and the - Bay of Biscay.]*

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-2), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

As generally every day now, today starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control $ppCO_2$ levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS (Internal Thermal Control System) cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking.]*

Preparatory to ATV "Jules Verne" undocking on 9/5, TsUP-Moscow downlinked several hours worth of test data of the ASN-M Satellite Navigation System from ~9:05am-1:40pm via S-band.

SHERE Update: "Greg: wonderful work on SHERE yesterday! Once again, we've gotten more than we had hoped for, and thank you for the test repeats. Also, thank you for your observations and comments in the crew notes, especially on the uniformity and symmetry of the fluid column. It has started us thinking about the effects of fluid overflow on the Force Transducer end and optical effects in our camera field of view."

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 19 Scheduled Main Activities:

- Mon. (8/25): RPCM LAB1D5/AvRack R&R; O_2 port install on WRS; ATV cargo transfers; SVO EDV condensate fill; TEPC relocate; Flowmeter battery maint.; ER5 rack transfer preps.
- Tue. (8/26): SRVK KAV sample; ATV cargo transfers; ER4/ER5 stow; ER4 relocate to JPM; ER5 relocate to JPM; ER4/ER5 umbillicals mate; ER4/ER5 restow.
- Wed. (8/27): MBI-12/Sonokard (FE-1); ATV cargo transfers; LULIN data dwnld.; DC1 IDZ-2 smoke detector cleaning; THC-IMV flow meas.; SVO BRP-M water sampling; IWIS setup; Emergency proc. OBT/drill; IWIS thruster test.
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- Fri. (8/29): BMP ch.2 regen; PHS w/blood (PCBA); 29P: LKT remove/ activate/hatch close/leak check; BRTK-MBRL prox.comm. prep; ITCS fluid sampling (JEM, Lab, Node-2, COL).

ISS Orbit (as of this morning, 8:01am EDT [= epoch]):
Mean altitude -- 355.7 km
Apogee height -- 361.6 km
Perigee height -- 349.7 km
Period -- 91.65 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0008791
Solar Beta Angle -- -30.2 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.71
Mean altitude loss in the last 24 hours -- 42 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55928

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
08/25/08 -- Progress M-64/29 SORR (Stage Operations Readiness Review) @ NASA/JSC
09/01/08 -- Progress M-64/29P undocking, from FGB nadir; de-orbit/re-entry ~9/8
09/05/08 -- ATV1 undocking, from SM aft port (loiter until 9/29 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
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12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at

http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/23/08
Date:	Saturday, August 23, 2008 2:41:53 PM
Attachments:	

ISS On-Orbit Status 08/23/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – mostly off duty for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff.*

Volkov & Kononenko performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the SM (Service Module) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

The CDR conducted the periodic service of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The process will be terminated at ~5:15pm EDT and Bed #2 regeneration completed tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time: 8/11&12)];*

At ~9:45am EDT the crewmembers conducted their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP-Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

For today's VolSci (Voluntary Weekend Science) program, another session with SHERE (Shear History Extensional Rheology Experiment), FE-2 Chamitoff –

- Activated the MSG (Microgravity Science Glovebox) from the A31p laptop,
- Powered on the SHERE hardware,
- Accessed the CGBA (Commercial Generic Bioprocessing Apparatus) to install the SHERE FM (Fluid Module) #9;
- Supported the first SHERE experiment run (Test Point 16);
- Transferred the module with the fluid sample,
- Installed FM #19 for the second experiment run (Test Point 2);
- Repeated the procedure (TP 5);
- Transferred the module with the fluid sample,
- Installed FM #7 for the third experiment run (Test Point 12);
- Repeated the procedure (TP 10);
- Removed the FM from the CGBA, followed by SHERE data transfer;
- (Had the option of a fourth run if time allowed, with FM #21 (TP 7), plus repeat (TP 13);
- Turned off the SHERE/CGBA equipment;
- Transferred the data files to the MSG laptop for subsequent downlink, and
- Powered down the MSG.

[Background: Rheology is the study of the deformation and flow of matter under the influence of an applied stress ("preshearing" = rotation) which might be, for example, a shear stress or extensional stress. In practice, rheology is principally concerned with extending the "classical" disciplines of elasticity and (Newtonian) fluid mechanics to materials whose mechanical behavior cannot be described with the classical theories. SHERE is designed to study the effect of preshear (rotation) on the transient evolution of the microstructure and viscoelastic tensile stresses for solutions with long chains of monodisperse dilute polymer molecules in the MSG. Collectively referred to as "Boger fluids," these polymer solutions have become a popular choice for rheological studies of non-Newtonian fluids and are the non-Newtonian fluid used in this experiment. The SHERE hardware consists of the Rheometer, Camera Arm, Interface Box, Cabling, Keyboard, Tool Box, Fluid Modules, and Stowage Tray.]

Kononenko completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Gregory filled out the regular FFQ (Food Frequency Questionnaire), his tenth, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is*

performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]

The two cosmonauts had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Oleg at ~6:40am, Sergey at ~8:15am EDT.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Sergey transferred the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

As generally every day now, today starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control ppCO_2 levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS (Internal Thermal Control System) cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking.]*

JEMRMS Update: Yesterday's Checkout #4 of the JEM Robotic Manipulator System (RMS) was completed for Stage 1 (TVC & Joint Angle Encoder Calibration). Stage 2 (Inching in Manual Mode) had to be aborted due to an emergency stop caused by a time overrun in the ACU (Arm Computer Unit). Investigation by JAXA is underway.

Weekly Science Update *(Expedition Seventeen -- Week 18)*

3-D SPACE: In progress.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Measurements continue in FGB module. Last memory card exchange performed on 8/13.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-2/CGBA-5 (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus 5): Silicate Garden Hab Side 2 is complete and CGBA-5 has now been powered off awaiting its move to EXPRESS Rack 2 (ER2). The Hab along with other CSI-02 equipment will be removed and returned home on ULF2.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): EuTEF platform is nominal. A DHPU (Data Handling Processing Unit) software patch is currently being developed to fix the link error issues encountered with DEBIE-2 and FIPEX instruments. On 8/14, EUTEF stayed on feeder#2 (survival heaters) during the duration of the COL S/W Cycle 11 update. The power-up sequence in the evening of 8/14 had some initial problems but could be completed upon a power cycle of the facility. All instruments were subsequently powered up. – DEBIE-2: IOP (Instrument Operations Procedures) performed for 24 hrs duration, after COL S/W Cycle 11 power-down on 8/14-25 and on 8/19-20. Generic status: link error still in work. However a work-around allows for regular science data acquisition using an on-board Instrument Operations Procedure (IOP), but not yet in conjunction with any FIPEX IOP – a final software patch, which will enhance the present instrument capabilities, is under finalization on ground;-- DOSTEL: On-going science acquisition;-- EuTEMP: Currently inactive as planned;-- EVC: Currently no picture taking;-- EXPOSE: On-going science acquisition;-- FIPEX: IOPs run from 8/15 until 8/18. A new run started on 8/20 and will end on 8/22; -- MEDET: Continuous science acquisition; -- PLEGPAY: Currently in READY mode, no science data

acquisition on-going;-- TRIBOLAB: The Ball-Bearing experiment #4 was restarted on 8/18 after thermal stabilization confirmation. This run will be paused for the thruster firing currently planned for 8/27.

FSL (Fluid Science Laboratory): FSL is nominal.

GEOFLOW: The second GEOFLOW run on FSL was performed on 8/19. The temperature gradient set-point of 2.2K could not be reached; actual gradient showed 1.8K. The run, however, was completed nominally with this temperature gradient. Impact on future runs to be assessed by science team. Data downlinking and ground data transfer experienced some difficulties, leading to a delay and cancellation of runs foreseen on 8/19-20. The difficulties are under further investigation, but it is expected that the next GEOFLOW run can be performed on 8/25 upon go-ahead from the science team to erase the data of the first two runs from the FSL hard disk.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Planned.

Marangoni Experiment for ISS (JAXA Fluid Physics Experiment Facility): First Marangoni Experiment on FPEF started on 8/21 during Orbit 2.

Micro-G Clay (JAXA EPO): On 8/11, Greg performed JAXA's first EPO experiment, Micro-G Clay. The clays are in the drying process.

MISSE (Materials ISS Experiment): Ongoing.

Moon Photography from ISS (JAXA EPO): Crew performed moon photo activity on 8/19. PI is checking the downlinked images.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 "Pirs".

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-1/-2 (Nitric Oxide Analyzer, ESA): The fourth and last NOA-1 session for both CDR and FE-1 was nominally performed on 8/19.

NUTRITION w/REPOSITORY: In progress.

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): "Greg, thus far, you have processed 14 Fluid Modules. The minimum number of SHERE test points for this investigation was 9. The preferred number is 20. We also have a significant level of success at 16 Fluid Modules, of which we are short by 2 test points."

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): In progress.

SOLAR (Solar Monitoring Observatory): Previous Sun observation window closed on 08/08 (GMT221). On 8/14, SOLAR stayed on feeder#2 (survival heaters) during the duration of the COL S/W Cycle 11 update. The power-up sequence in the evening of 8/14 experienced difficulties. Upon a COL LAN switch cycle and SOLAR power cycle, the SOLAR instruments were activated on power feeder#1 again on 8/15. Next sun visibility window to open on 8/25.-- SOVIM: out of Sun visibility, so no science data acquisition; -- SOLSPEC: out of Sun visibility, so no science data acquisition; -- SOLACES: out of Sun visibility, so no science data acquisition.

SOLO: Planned.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): During the BLB (BIOLAB) checkout after COL S/W (Columbus Orbital Laboratory Software) Cycle 11 update, the Incubator TCS (Thermal Control System) could not be activated. It was suspected that some of the switches on one of the BIOLAB-ESEM (Exchangeable Standard Electronic Modules) boards were out of config. On 8/21, the crew corrected the BLB-ESEM switch positions. This will allow a troubleshooting plan to be developed to recover all the BIOLAB functionalities, following the BIOLAB Rotor A bellow test by ground commanding on 8/22. The next steps in the recovery of all the BIOLAB functionalities will be the replacement of 6 Reference ECs (Experiment Containers) on Rotor B and subsequent test of Rotor B. Planning for these activities is currently TBD.

CEO (Crew Earth Observations): Through 8/21 the ground has received a total of 4,958 frames of CEO images for review and cataloging. "Photos acquired with times corresponding to our CEO daily target list request times are reviewed first and this week included: Mount Rainier (not acquired); Mount Etna (acquired, too cloudy); Mauna Loa, Hawaii (acquired-too cloudy); Andrew Forest (partial acquisition, soft); Santorini Volcanic Complex, Greece (acquired-still under review); Slate Island Impact (acquired); Tunis, Tunisia (acquired-still under review); Libyan megafan (to be reviewed); Algerian megafan (to be reviewed); and Tropical Storm Fay (acquired-captioned and released by PAO). We are seeing improvement in the focus and consistency of your long-lens photos; please continue with more practice when you can. Your rare, striking view of the southern tip of Greenland will be published on NASA/GSFC's Earth Observatory website this weekend. Your high-oblique, panoramic view was shot as the ISS passed over Newfoundland and offers a great perspective the ice field, glaciers, and topography of part of the Earth's largest island. Nice shot!"

CEO (Crew Earth Observations) photo targets uplinked for today were **Barringer Impact Crater, Arizona** *(this well-known crater is so young [~50,000 years] that its circular rim has not yet been eroded away. Recent calculations suggest that the impactor was a meteorite ~50m in diameter traveling at 12.8 km/sec [28,600 mph]. Looking right: visual cues are a winding river and the forest line),* **Jornada Basin, New Mexico** *(nadir pass. If Greg shot overlapping images of the Rio Grande floodplain [green, vegetated zone] he will have gotten this site. Desertification of local soils, as interpreted from changing vegetation patterns, is the research interest),* and **Gulf of Fonseca, Central America** *(looking left for images of this major embayment in the coastline. Three countries meet along the shoreline of the gulf. Heavy use of the coastline includes numerous newly constructed aquaculture basins).*

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 19 Scheduled Main Activities:

- Sun. (8/24): Station cleaning (USOS); BMP ch.2 regen; PFC (FE-2).
- Mon. (8/25): RPCM LAB1D5/AvRack R&R; O_2 port install on WRS; ATV cargo transfers; SVO EDV condensate fill; TEPC relocate; Flowmeter battery maint.; ER5 rack transfer preps.
- Tue. (8/26): SRVK KAV sample; ATV cargo transfers; ER4/ER5 stow; ER4 relocate to JPM; ER5 relocate to JPM; ER4/ER5 umbillicals mate; ER4/ER5 restow.
- Wed. (8/27): MBI-12/Sonokard; ATV cargo transfers; LULIN data dwnld.; DC1 IDZ-2 smoke detector cleaning; THC-IMV flow meas.; SVO BRP-M water sampling; IWIS setup; Emergency proc. OBT/drill.

ISS Orbit (as of this morning, 8:50am EDT [= epoch]):
Mean altitude -- 355.7 km
Apogee height -- 361.6 km
Perigee height -- 349.8 km
Period -- 91.65 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.000874
Solar Beta Angle -- -32.9 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.71
Mean altitude loss in the last 24 hours -- 31 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55913

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
08/25/08 -- Progress M-64/29 SORR (Stage Operations Readiness Review) @ NASA/JSC
09/01/08 -- Progress M-64/29P undocking, from FGB nadir; de-orbit/re-entry ~9/8
09/05/08 -- ATV1 undocking, from SM aft port (loiter until 9/29 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)

10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) or 10/24?
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/22/08
Date:	Friday, August 22, 2008 2:13:48 PM
Attachments:	

ISS On-Orbit Status 08/22/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Volkov began his day by downlinking yesterday's Norton AntiVirus (NAV) data from the RSK-1 laptop scan. Later in the day, FE-2 Chamitoff also ran the scan on the SSC (Station Support Computer) to be used for downloading today's 1553-bus comm files of the JEMRMS (Japanese Experiment Module/Robotic Manipulator System) Checkout #4 from the RLT (RMS Laptop Terminal) to the OpsLAN for downlinking. *[All A31p laptops onboard are currently being loaded with latest NAV software and updated definition files for increased protection.]*

FE-1 Kononenko continued (and wrapped up) the installation of the two new Zveno-B ("Link-B") modems plus their stand-alone RSE2 laptop, plus their integration into the BKS onboard cabling and the TVS LIV television system, with the BITS2-12 onboard telemetry measurement system aqnd VD-SU monitoring mode deactivated during the outfitting activities (which also required the Elektron oxygen generator to be turned off). TVS LIV was then reconfigured and the worksites cleaned up.

Later, the Elektron electrolysis machine was activated at 32 amps, supported by Volkov monitoring the external temperature of its secondary purification unit (BD) for the first 10 minutes of operations to ensure that there was no overheating. In support of the reactivation, at ~7:12am EDT the ground temporarily switched the ATV (Automated Transfer Vehicle) to autonomous power (i.e., disconnected it electrically from ISS) and later reconfigured it to ISS power, with its lights back on at ~8:12am. *[The gas analyzer used on the Elektron during nominal operations for detecting hydrogen (H_2) in the O_2 line (which could cause overheating) is not included in the control algorithm until 10 minutes after Elektron startup.]*

As is usual after deactivation/reactivation of VD-SU monitoring mode, Sergey

performed a quick checkout of the SUBA Ethernet connection between OpsLAN and the BRI Smart Switch Router in the SM.

Volkov also conducted the periodic maintenance/checkout of the spare BZh Liquid Unit (#056) for the Elektron generator, *[Objective of the checkout of the BZh, which has been in stowage for 1.5 years, was to check for leakage and good water passage through the feed line inside of the BZh (from ZL1 connector to the buffer tank) and to check the response of the Electronics Unit's micro switches (signaling "Buffer Tank is Empty" & "Buffer Tank is Full". The last test pressurization to monitor for leakage was on 7/20. During Elektron operation, the inert gas locked up in the BZh has the purpose to prevent dangerous O_2/H_2 mixing. A leaking BZh cannot be used.]*

Working closely with JAXA flight controllers on the ground, FE-2 Chamitoff conducted the JEMRMS Checkout #4 which featured more motions of its MA (Main Arm) in space. The maneuvers were observed by the SSRMS (Space Station Remote Manipulator System) video cameras via SSC-14 near the JEMRMS workstation and ISL (Integrated Station OpsLAN) Ethernet cable. *[After activating the RLT (RMS Laptop Terminal), CCP (Camera Control Panel) and RMS Monitors, and adjusting settings including updating the DOUG (Dynamic Onboard Ubiquitous Graphics) laptop application with realtime data, Greg "flew" the MA around the EFU13 (Exposed Facility Unit 13) on the JLP (JEM Logistics Pressurized Section) module to capture target images using the television camera on the MA EE (End Effector) for calibration purposes, followed by so-called "inching" operations, as a crew-in-the-loop demonstration to verify how small a command the crewmember can input using the hand controllers in Manual Mode (this inching operation is expected to be used on Flight 2J/A and subsequent flights if the RTL (Ready-to-Latch) judgment for a P/L (payload) berthing is not OK and the operator is requested to get the P/L closer to an EFU.]*

Also in the Kibo JPM, Gregory retrieved the MEU (Measurement Experiment Unit) with its Bs cultivation chamber from the CBEF (Cell Biology Experiment Facility) incubator, where he had installed MEU-Bs on 8/8.

Sergey Volkov continued the current round of periodic preventive maintenance of ventilation systems in the RS (Russian Segment), today cleaning the ventilation screens of panels 201, 301, 401, 116, 316, 231 & 431 in the FGB.

Sergey also checked out the Russian AOK GANK-4M Real-Time Harmful Contaminant Gas Analyzer system with the objective of troubleshooting a potential zero-sensor shift or damage of its cassette tape.

Chamitoff took measurements for the regular atmospheric status check for $ppCO_2$ (Carbon Dioxide partial pressure) in the Lab, SM (at panel 449) and COL (Columbus Orbital Laboratory) plus battery ticks, using the hand-held CDMK (CO_2 Monitoring Kit, #1002). The unit was then deactivated and returned to its stowage location (LAB1S2). *[Purpose of the 5-min activity is to trend with MCA (Major Constituents Analyzer), i.e., to correlate the hand-held readings with MCA measurements.]*

The CDR conducted the monthly FDS PEP (Fire Detection & Suppression/Portable Emergency Provisions) safety inspection/audit in the ISS modules. *[The IMS-supported inspection involves verification that PFEs (Portable Fire Extinguishers), PBAs (Portable Breathing Apparatus), QDMAs (Quick-Don Mask Assemblies) and EHTKs (Extension Hose/Tee Kits) are free of damage to ensure their functionality, and to track shelf life/life cycles on the hardware. QDMA harness inspection was not required today.]*

In the US Lab, Oleg powered down the EHS VOA (Environmental Health System-Volatile Organic Analyzer).

In preparation for the Progress M-64/29P undocking on 9/1, the CDR & FE-1 worked in the transfer tunnel to install the SSVP StM docking mechanism (Stykovochnovo mekhanizma) between the cargo ship and the FGB, a one-hour routine activity. *[The StM is the "classic" probe-and-cone type, consisting of an active docking assembly (ASA) with a probe (SSh), which fits into the cone (SK) on the passive docking assembly (PSA) for initial soft dock and subsequent retraction to hard dock. The ASA is mounted on the Progress' cargo module (GrO), while the PSA sits on the docking ports of the SM, FGB and DC1.]*

Oleg performed another run of the Russian DZZ-2 "Diatomeya" ocean observations program, using the NIKON-F5 DCS still camera to record color field patterns in highly productive waters of the Pacific and Atlantic oceans. *[Uplinked target zones in the Atlantic Ocean were along the track from Gulf of Saint Lawrence to the NW of Azores, and in the Pacific the Californian upwelling area.)*

Sergey conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The CDR also took care of the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations,

for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Working off the Russian discretionary “time permitting” task list, Kononenko conducted the regular status check of the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Oleg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~4:00am EDT, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU/*Glavnaya operativnaya gruppa upravleniya* = *“Main Operative Control Group”*), including Shift Flight Director (SRP), at TsUP-Moscow via S-band/audio, phone-patched from Houston and Moscow.

At ~4:30am, Sergey & Oleg linked up with TsUP stowage specialists via S-band to conduct the weekly IMS tagup, discussing inventory & stowage issues, equipment locations and ATV & Progress cargo transfers.

At ~9:55pm, Dr. Chamitoff supported two live interactive PAO interviews of ~10 minutes each, with WKYC-TV, Cleveland, OH, and Fox Business News, New York, NY.

At ~2:22pm, the ISS crew will have their regular weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC (Station Support Computer)]*.

As generally every day now, today starting at ~5:00am and running until 11:00am, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control ppCO_2 levels. This configuration for the daily ops does not require connecting & disconnecting the ITCS (Internal Thermal Control System) cooling loop. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking.]*

Grounding Straps Update: The retrieval of ten US grounding straps from the JLP (JEM Logistics Pressurized Section) reported on 8/20 has been delayed until 8/25 (Monday). The straps will be required for the HRF rack relocations next week (two for the MELFI rack and four each for the ER-4 & ER-5 racks).

SRVK-2M Correction: The failed separator in the Russian SRVK-2M condensate water processor lasted ~80% of its expected life-time, not 20% as reported yesterday.

VolSci Preview: For tomorrow's Voluntary Weekend Science program, Gregory has selected another session with the SHERE (Shear History Extensional Rheology Experiment) payload. Planned are three runs (which would bring the total for this Increment to 17), plus two repeats, and one run will have changed parameter settings.

CEO (Crew Earth Observations) photo targets uplinked for today were **Gordion, Turkish archaeological site** *(requested were generalized images of the area around this famous archeological site. The site is near a wooded mountain range. Looking right: lead-in cues were three lakes),* **Toshka Lakes, Egypt** *(general views of the entire lake system were requested for comparison with prior images when lake levels were higher),* and **Ile Rouleau Impact Crater, Quebec** *(this 4-km diameter crater now forms an island at the south end of one of Quebec's largest lakes, Lake Mistassini. ISS had a nadir pass).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 18/19 Scheduled Main Activities:

- Sat. (8/23): Station cleaning (RS); BMP ch.1 regen; PFCs (CDR, FE-1); VolSci (SHERE); FFQ.
- Sun. (8/24): Station cleaning (USOS); BMP ch.2 regen; PFC (FE-2).
- Mon. (8/25): RPCM LAB1D5/AvRack R&R; O_2 port install on WRS; ATV cargo transfers; SVO EDV condensate fill; TEPC relocate; Flowmeter battery maint.; ER5 rack transfer preps.
- Tue. (8/26): SRVK KAV sample; ATV cargo transfers; ER4/ER5 stow; ER4 relocate to JPM; ER5 relocate to JPM; ER4/ER5 umbillicals mate; ER4/ER5 restow.

ISS Orbit (as of this morning, 8:31am EDT [= epoch]):
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Perigee height -- 350.0 km
Period -- 91.66 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0008547
Solar Beta Angle -- -35.2 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.71
Mean altitude loss in the last 24 hours -- 45 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55897

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
08/25/08 -- Progress M-64/29 SORR (Stage Operations Readiness Review) @ NASA/JSC
09/01/08 -- Progress M-64/29P undocking, from FGB nadir; de-orbit/re-entry ~9/8
09/05/08 -- ATV1 undocking, from SM aft port (loiter until 9/29 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft)
10/01/08 -- **NASA 50 Years** (official)
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11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
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11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**

07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/21/08
Date:	Thursday, August 21, 2008 2:45:17 PM
Attachments:	

ISS On-Orbit Status 08/21/08

All ISS systems continue to function nominally, except those noted previously or below.

After configuring the PFE-OUM (Periodic Fitness Evaluation - Oxygen Uptake Measurement) equipment at the HRF-2 (Human Research Facility 2) rack, Gregory Chamitoff conducted his first PFE-OUM session on the CEVIS (Cycle Ergometer with Vibration Isolation) while wearing an HRM (Heart Rate Monitor), with Sergey Volkov as operator to obtain measurements of the subject. *[The equipment includes the HRF PFM/PAM (Pulmonary Function Module/Photoacoustic Analyzer Module), Mixing Bag System and GDS (Gas Delivery System). Today's session used GDS tanks 1, 2 & 5. After calibration of the DPFM (Differential Pressure Flowmeter), Greg, assisted by Sergey, worked through the protocol, changing the loads on the ergometer and recording data. Later, the FE-2 updated the evaluation protocol, deactivated & stowed the gear, and powered down the PFE-OUM laptop. Purpose of PFE-OUM is to measure aerobic capacity during exercise within 14 days after arrival on ISS, and once monthly during routine PFEs. The data allows exercise physiologists & flight doctors to assess the crew's health & fitness and to provide data for modifying & updating crew-specific exercise regimes. By hooking up a special cable, continuous oxygen uptake measurements can now be taken while riding the CEVIS without requiring access to the CEVIS control panel as before. PFE-OUM is a collaborative effort between NASA and ESA (European Space Agency).]*

Volkov and Kononenko continued communications outfitting activities in the SM (Service Module) by finishing the installation of two new "Zveno-B" (Link-B) modems with their cabling behind panel 437, connecting one to a BSK-1B Common Power Switching Timer, the other to an LKTs Local Digital Commutator (switch) and both to a controlling A31p laptop, RSE2. *[The modems link the RSE2 to the SM REGUL comm system, enabling data to be uplinked/downlinked and commands to be uplinked directly. Regul provides for two-way voice*

communication, digital command/program information as well as telemetry transmission via RGS (Russian Groundsites). It also has the capability to receive and transmit range, radial velocity, and time-referenced information. It is the nominal uplink path for all Russian commands and is the only subsystem that operates using the Command Radio Link (KRL). Operating at a low data rate, it is equivalent to the U.S. S-band system. There is no Russian equivalent of the U.S. high data rate Ku-band system, based on the TDRS satellites.]

The FE-1 took the periodic readings of potentially harmful atmospheric contaminants in the SM, using the CMS (Countermeasure System), a component of the SKDS GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, today using preprogrammed microchips to measure for Isopropanol ("rubbing alcohol", C_3H_8O), Methanol ("wood alcohol", CH_3OH) and Toluene (methylbenzene, C_7H_8).

In the COL (Columbus Orbital Laboratory), in support of ground-commanded FSL (Fluid Science Laboratory)/GeoFlow checkout ops, Chamitoff inserted an SDLT-II digital line tape in the FSL's VMU (Video Management Unit) tape recorder. About 6.5 hrs later, the tape was removed, labeled "GeoFlow-234" and stowed.

Also in COL, the FE-2 had ~10 min reserved for a status check of the BLB ESEM3-2 (Biolab Exchangeable Standard Electronic Module 3-2) power board.

ESA ground controllers continued the "Cycle 11" software transition aboard COL, today focusing on PWS-1 (Portable Work Station 1) laptop, supported by Chamitoff as he did last week for PWS-2. The CDs with the new software were stowed afterwards. *[After the transition, COL will gradually be powered back on, including external payloads.]*

In the JAXA Kibo/JPM (JEM Pressurized Module), Gregory activated the RLT (Robotics Laptop Terminal) of the JEMRMS (JEM Robotic Manipulator System) to set up/enable a new database uplinked by flight controllers, then turned it off again, later reviewing & checking the DOUG (Dynamic Onboard Ubiquitous Graphics) files for tomorrow's scheduled RMS C/O-4 (Checkout #4). *[During C/O-4, Greg will "fly" the JEMRMS MA (Main Arm) around the EFU13 (Exposed Facility Unit 13) on the JLP (JEM Logistics Pressurized Section) module to capture target images using the television camera on the MA EE (End Effector) for calibration purposes, followed by so-called "inching" operations, as a crew-in-the-loop demonstration to verify how small a command the crewmember can input using the hand controllers in Manual Mode (this inching operation is expected to be used on Flight 2J/A and subsequent flights if the RLT (Ready-to-Latch) judgment for a P/L (payload) berthing is not OK and the operator is requested to get the P/L closer to an EFU.]*

Conducting periodic EHS CSA-CP (Environmental Health System - Compound Specific Analyzer-Combustion Products) maintenance, Gregory removed the battery of the prime CSA-CP unit and replaced it with a fresh one (#1198). *[The US CSA-CP is a passive cabin atmosphere monitor that provides quick response capability during a combustion event (fire). Its collected data are stored on a logger. After replacing the prime unit's battery, Gregory zero-calibrated the instrument (to eliminate drift in the combustion sensors). Following zero calibration, prime unit was deployed again at the SM Central Post.]*

Sergey Volkov completed the TVIS treadmill part of the onboard preventive health maintenance fitness test "Profilaktika" (MBI-8, "Countermeasures"), which could not be performed on 8/5 as per original plan due to the TVIS repair activities. Kononenko took the MBI-8 test yesterday. *[Test procedure for MBI-8, which requires workouts on the VELO and TVIS, is identical to the Russian MO-5 assessment, but in addition to the nominal procedure it uses the TEEM-100M gas analyzer with breathing mask, a blood lactate test with the ACCUSPORT analyzer and REFLOTRON-4 accessories, and a subjective evaluation of physical exertion levels during the test (using the Borg Perceived Exertion Scale, viz., 10 steps from very light over hard and very hard to maximum). Results are entered on a log sheet. TEEM and ECG (electrocardiograph) data are transferred to the RSE-Med laptop, also on a tape cassette (Cardiocassette-2000), and prepared for later downlink via Regul-Packet comm. Results are also called down to specialists standing by at TsUP.]*

In the US Airlock (A/L), the FE-2 terminated the second recharge/discharge maintenance cycle on EMU (Extravehicular Mobility Unit) battery #2073, started on 8/19. *[Since the due date for the regular 85-day maintenance was expired, an additional maintenance cycle was required after the battery's discharge. The periodic maintenance consists of fully discharging (and later recharging) the storage units to prolong their useful life. After end of the maintenance cycle, Greg restored the SSC laptop, which is used in DOS mode for the automated procedure, to nominal ops.]*

Gregory completed another one of the periodic (monthly) inspections of the RED (Resistive Exercise Device) canister cords and accessories.

FE-1 Kononenko activated the four Pille dosimeters of the Lulin-ISS radiation complex to start data taking, after having set them up yesterday with their ICU (Interface Control Unit, Russian: BUI) for battery recharging.

The FE-2 completed the weekly 10-min. CWC inventory as part of on-going WRM (Water Recovery & Management) assessment of onboard water supplies. *[The new card (17-0002V) lists 34 CWCs (Contingency Water Containers,~1204.3 L*

total) for the four types of water identified on board: technical water (426.5 L, for flushing only because of Wautersia *bacteria), potable water (706.7 L, incl. 174.6 L currently on hold), condensate water (54.1 L), waste/EMU dump and other (17 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

Sergey checked another Russian laptop, today RSK-1, for software virus by scanning its hard drives and a photo disk with the Norton AntiVirus application.

The CDR also conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Oleg Kononenko took care of the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The three station residents conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-1, FE-2/OUM), TVIS treadmill (CDR), RED resistive exercise device (FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Oleg transferred the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~12:35pm EDT, the two cosmonauts downlinked a TV message of greetings for replay at Gidroaviasalon-2008 (Hydro-Aviation Show 2008) on 9/3 in Gelendzhik. Gidroaviasalon is a one-of-a-kind annual international hydro-aviation show with increasing popularity, with the prime objective to showcase Russia as a major space and aviation market player and to initiate new international projects. *["… The Expedition 17 crew of the International Space Station is extending their heartfelt greetings to the participants and guests of the Seventh International Hydro-Aviation Show, the Third Russian Song Festival Krylia Rossyi (Wings of Russia), and all citizens of the resort town Gelendzhik…."]*

VHF Comm Check Update: The periodic VHF-1 emergency communications check conducted by Gregory Chamitoff on 8/18 over NASA's VHF (Very High Frequency) stations could not be completed successfully when calls from the Control Centers could not be heard by the crew and COL-CC did not get uplink or

downlink calls. Troubleshooting is in work.

SRVK Update: Yesterday TsUP-Moscow observed the failure of a separator in the SRVK-2M condensate water processor, which apparently lasted only about 20% of its expected life-time. Spares are available onboard and planning is underway to replace failed separator, using Line 3 which has a new one.

CBEF Update: JAXA specialists are continuing to assess the CO_2 leak in the CBEF CGSA (Cell Biology Experiment Facility/Common Gas Support Assembly) in the JPM. Troubleshooting is planned on 9/5.

NODE-2 SD-2 Update: The failure of the Smoke Detector #2 in Node-2 is still under investigation, because it exhibited previously not seen signatures. Meanwhile, SD-1 is active and nominal, and there is a spare SD available onboard.

CEO (Crew Earth Observations) photo targets uplinked for today were **Urumqi, China** *(shooting overlapping nadir views of China's booming oil city which lies at the foot of the mountains. City margins are of greatest interest),* **Typhoon Nuri, South China Sea** *(Dynamic event. This storm is still moving NW, and is expected to make landfall on the Chinese coast on Friday. ISS passed almost directly over the eye. Nuri is a Category 3 storm),* **Libyan Megafans** *(looking left for detailed images of the vast inland deltas north of the Tibesti Mountains. Widespread stream channel networks are the object interest),* and **Tropical Storm Fay, Florida** *(Dynamic event. Fay is moving slowly up Florida's east coast and is expected to pass over Jacksonville).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 18/19 Scheduled Main Activities:

- Fri. (8/22): EMU batt. #2073 maint.; BKS cabling for Zveno (Link); Zveno-B unit install in ZVK LIV exp. video complex; RSE-2 laptop set-up for Zveno-B; PEPS inspect/checkout; Elektron BZh unit #56 leak check; Elektron On; JEMRMS Checkout #4; GANK & CDMK reading; Progress M-64 SSVP-StM docking mechanism install.
- Sat. (8/23): Station cleaning (RS); BMP ch.1 regen; PFCs (CDR, FE-1); VolSci.; FFQ.
- Sun. (8/24): Station cleaning (USOS); BMP ch.2 regen; PFC (FE-2).
- Mon. (8/25): ATV cargo transfers; SVO EDV condensate fill; TEPC relocate; Flowmeter battery maint.; ER5 rack transfer preps.

ISS Orbit (as of this morning, 9:39am EDT [= epoch]):
Mean altitude -- 355.8 km
Apogee height -- 361.5 km
Perigee height -- 350.1 km
Period -- 91.66 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.000848
Solar Beta Angle -- -36.9 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.71
Mean altitude loss in the last 24 hours -- 60 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55882

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
08/25/08 -- Progress M-64/29 SORR (Stage Operations Readiness Review) @ NASA/JSC
09/01/08 -- Progress M-64/29P undocking, from FGB nadir; de-orbit/re-entry ~9/8
09/05/08 -- ATV1 undocking, from SM aft port (loiter until 9/29 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) or 10/24?
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit

05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/20/08
Date:	Wednesday, August 20, 2008 12:31:19 PM
Attachments:	

ISS On-Orbit Status 08/20/08

All ISS systems continue to function nominally, except those noted previously or below.

Before breakfast and exercise, all crewmembers completed a 10-min session with the periodic Russian MedOps test "Hematokrit" (MO-10), which measures the red cell count of the blood, with CDR Volkov acting as CMO (Crew Medical Officer, Russian: Examiner). It was the third session for Volkov & Kononenko, the second for Chamitoff. *[The blood samples were drawn from a finger with a perforator lancet, then centrifuged in two microcapillary tubes in the M-1100 kit's minicentrifuge, and its hematocrit value was read off the tubes with a magnifying glass. It is a well-known phenomenon of space flight that red blood cell count (normal range: 30-45%) tends to go down over time. After the exam, the data were saved in the IFEP software (In-Flight Examination Program) on the MEC (Medical Equipment Computer), and Kononenko stowed the equipment.]*

The CDR performed the periodic accuracy check on four RS (Russian Segment) vacuum pressure gauges (MV). *[Two in the Service Module (SM), one in the DC1 Docking Compartment, and one in the Soyuz TMA-12 Orbital Compartment (BO).]*

After activating the RS2 laptop, Volkov configured the new A31p laptop set up in the US Lab as SM Central Post (CP) Remote Workstation and ran functional tests between it and the Central Post Computer 1 (KTsP1), in “Slave” mode, via the RS1 laptop. *[Meanwhile KTsP2, with the RS2 laptop, was online in “Master” mode. Afterwards, KTsP1 was switched back to Master mode and RS2 was shut down.]*

In the SM, Kononenko & Volkov readied equipment, cabling and behind-panel space for the upcoming installation of new Zveno-B (Link) hardware and the RSE2 laptop, tagging up with ground specialists via S-band as required.

FE-2 Chamitoff made further preparations for the planned relocation of ER-4 (EXPRESS Rack 4) & ER-5 from the Lab to the Kibo JPM (JEM Pressurized

Module), today by relocating

- the Ku-band Forward Transmitter from ER-4 to ER-2 and testing it,
- the CGBA-4 (Commercial Generic Bioprocessing Apparatus 4) payload from ER-4 to ER-1, and
- the CGBA-5 payload from ER-4 to ER-2.

Also in preparation for the upcoming US rack installations in Kibo, the FE-2 retrieved ten US grounding straps from the JLP (JEM Logistics Pressurized Section), two for the MELFI (Minus Eighty Degree Laboratory Freezer for the ISS) rack and four each for the ER-4 & ER-5 racks.

Afterwards, Gregory had another 2h 15m for moving cargo from and to the ATV (Automated Transfer Vehicle), including ~1h 15m for transferring ESA equipment to the COL (Columbus Orbital Laboratory).

In support of ISS science, Sergey Volkov assembled the geophysical GFI-1 Relaksatsiya ("relaxation") experiment from six GFI-1 hardware kits, reconfigured the Payload Laptop 3 for the experiment and mounted the UV (ultraviolet) camera with SP spectrometer unit at SM window #9. Purpose of the following ~15 min (9:20am – 9:35am EDT) data take was to contribute to a hyperspectral space/time study of images and radiation patterns from the Earth atmosphere and surface from spectra recorded with the UV camera, spectrometer, Laptop 3 and camcorder. Afterwards the equipment was stowed again. *[Relaksatsiya normally deals with the study of the chemoluminescent chemical reactions and atmospheric light phenomena (emissions, i.e., molecular relaxation processes), including those that occur during high-velocity interaction between the exhaust products from space vehicles and the atmosphere at orbital altitude and during the entry of space vehicles into the Earth's upper atmosphere.]*

Kononenko completed the TVIS treadmill part of the onboard preventive health maintenance fitness test “Profilaktika” (MBI-8, “Countermeasures”), which he could not perform on 8/5 pending the TVIS repair activities. *[Test procedure for MBI-8, which requires workouts on the VELO and TVIS, is identical to the Russian MO-5 assessment, but in addition to the nominal procedure it uses the TEEM-100M gas analyzer with breathing mask, a blood lactate test with the ACCUSPORT analyzer and REFLOTRON-4 accessories, and a subjective evaluation of physical exertion levels during the test (using the Borg Perceived Exertion Scale, viz., 10 steps from very light over hard and very hard to maximum). Results are entered on a log sheet. TEEM and ECG (electrocardiograph) data are transferred to the RSE-Med laptop, also on a tape cassette (Cardiocassette-2000), and prepared for later downlink via Regul-Packet comm. Results are also called down to specialists standing by at TsUP.]*

In the FGB module, Volkov worked on the BR-9TsU-8 Radiotelemetry System (RTS), supporting the ground in verifying temperature measurements by two sensors (T97, T98) of the SIT-9L Temperature Measuring System.

Gregory unstowed and set up the PFE-OUM (PFE-Oxygen Uptake Measurement) equipment on the HRF-2 (Human Research Facility 2) rack, including the PFM/PAM (Pulmonary Function Module/Photoacoustic Analyzer Module), Mixing Bag System and GDS (Gas Delivery System), for his and Sergey's first PFE-OUM protocol session tomorrow. *[The PFE-OUM experiment, using the CEVIS ergometer for workout, demonstrates the capability of crewmembers to perform periodic fitness evaluations with continuous oxygen consumption measurements within 14 days after arrival on ISS, and once monthly during routine PFEs. Once the capability of the pulmonary function system (PFS) to perform PFEs is verified, crewmembers will be able to integrate their monthly PFE with oxygen consumption measurements to fulfill the requirement for cardiovascular fitness evaluations during long-duration space flight.]*

Starting a new round of preventive maintenance on the RS ventilation system, Oleg Kononenko replaced the four dust collector filters (PF1-4) in the SM.

Oleg also conducted the periodic checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the passageways SM PrK (Transfer Compartment)–ATV, PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1.

The FE-1 took and called down the periodic dosage readings of the Russian "Pille-MKS" (MKS = ISS) radiation dosimetry experiment, which has ten sensors placed at various locations in the RS (DC1, SM starboard & port cabin windows, ASU toilet facility, control panel, etc.). Afterwards, two dosimeters were transferred from inside the ATV (near FE-1 sleep station) to a stowage pouch, and one sensor was relocated in the SM. *[Nine of the ten dosimeters are read manually.]*

Kononenko also set up the four Pille dosimeters of the Lulin-ISS radiation complex with its ICU (Interface Control Unit, Russian: BUI) turned on for recharging their batteries, preparatory to tomorrow's activation for data taking.

Oleg took the periodic photographs of the plants growing in the BIO-5 Rasteniya-2 ("Plants-2") Lada-13 greenhouse, using the Nikon D2X photo camera with F=17-55 mm lens, then downlinked the images via BSR-TM. The regular status check of the payload which researches growth and development of plants (peas) under spaceflight conditions, was also conducted, from the Russian discretionary "time permitting" task list.

Later, Kononenko conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Oleg also performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The three station residents conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (CDR). Later, the FE-1 transferred the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~4:20pm EDT, Greg Chamitoff is scheduled for his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop),

As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control $ppCO_2$ levels. In this configuration for the daily ops, connecting & disconnecting the ITCS (Internal Thermal Control System) cooling loop is not required. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking.]*

"Job jar" Update: Task suggestions in Chamitoff's discretionary "job jar" list today involve for JAXA, additional postlaunch reconfiguration on CBEF (Cell Biology Experiment Facility), and for ESA/Columbus, checkout of the BLB ESEM3-2 (Biolab Exchangeable Standard Electronic Modules) power board, removal of four WAICO1 ECs (Waving & Coiling of Arabidopsis Roots at Different g-levels Experiment Containers) from Rotor B, followed by installation of six RECs (Reference ECs) on Rotor B.

CEO (Crew Earth Observations) photo targets uplinked for today were **Typhoon Nuri, Philippines** *(this hurricane is moving NW across the northern Philippines*

[projected to lie just north of the Philippines by the time of this pass]. Aiming right. Nuri is expected to be a Category 3 storm by the time it reaches the Chinese coast), **Mount Vesuvius, Italy** *(looking left at the head of Naples Bay for this famous volcano),* **Mt. Etna, Sicily** *(looking right for the smoking Etna volcano at the near point of the island of Sicily),* and **Lake Nasser, Toshka Lakes***, Egypt (water levels in Egypt's southern lake system are starting to decline. Shooting right of track [west of the Nile] for these string of lakes)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 18 Scheduled Main Activities:

- Thu. (8/21): LULIN dosimeter placement; EMU Battery maint.; PFE-OUM ops; BKS cable outfitting for Zveno-B (Link B) unit; DOUG revw/prep for JEMRMS Checkout #4; COL Cycle 11 transition for PWS-1; WRM/CWC water audit.
- Fri. (8/22): EMU batt. #2073 maint.; BKS cabling for Zveno (Link); Zveno-B unit install in ZVK LIV exp. video complex; RSE-2 laptop set-up for Zveno-B; PEPS inspect/checkout; Elektron BZh unit #56 leak check; Elektron On; JEMRMS Checkout #4; GANK & CDMK reading; Progress M-64 SSVP-StM docking mechanism install.
- Sat. (8/23): Station cleaning (RS); BMP ch.1 regen; PFCs (CDR, FE-1); VolSci.
- Sun. (8/24): Station cleaning (USOS); BMP ch.2 regen; PFC (FE-2).

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/01/08 -- Progress M-64/29P undocking, from FGB nadir; de-orbit/re-entry ~9/8
09/05/08 -- ATV1 undocking, from SM aft port (loiter until 9/29 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) or 10/24?
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit

11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/19/08
Date:	Tuesday, August 19, 2008 3:08:46 PM
Attachments:	

ISS On-Orbit Status 08/19/08

All ISS systems continue to function nominally, except those noted previously or below.

Before breakfast & first exercise, CDR Volkov, FE-1 Kononenko and FE-2 Chamitoff completed a full session with the Russian crew health monitoring program's medical assessment MO-9/Biochemical Urinalysis. Afterwards, the FE-1 closed out and stowed the Urolux hardware. *[MO-9 is conducted every 30 days (and also before and after EVAs) and is one of five nominal Russian medical tests adopted by NASA for U.S. crewmembers for IMG PHS (Integrated Medical Group/ Periodic Health Status) evaluation as part of the "PHS/Without Blood Labs" exam. The analysis uses the sophisticated in-vitro diagnostic apparatus Urolux developed originally for the Mir program. Afterwards, the data are entered in the MEC (Medical Equipment Computer)'s special IFEP software (In-Flight Examination Program).]*

Kononenko performed the periodic extensive audit/inventory of all lights (SD1-7) in the RS (Russian Segment), supported by an uplinked detailed listing of 42 deployed lamps (SM: 24; FGB: 12; DC1: 4+2 portable) and another 42 spare lamps in FGB stowage bags.

Later, Volkov conducted an audit/inventory of SVO Water Supply System equipment in the RS, checking three containers with undocumented contents, i.e., not detailed in the IMS (Inventory Management System).

After the CDR set up the equipment for the NOA/Nitric Oxide Analyzer (MBI-21) payload, both he and the FE-1 undertook the experiment session (Sergey's fifth, Oleg's fourth), filling in the electronic log book on the RSE1 laptop for downlink and restowing the hardware. Each subject took two NO (Nitric Oxide) measurements in exhaled air. Afterwards, the hardware was re-stowed. *[Purpose of the ESA experiment ESANO1, consisting of the "Platon" analyzer and its power supply, is to*

monitor expired NO in the subject's exhaled air to detect signs of airway inflammation and indications of venous gas emboli (bubbles) that may be caused by inhalation of pollutants in the closed environment of the ISS cabin and increased risk of decompression sickness.]

After configuring the JAXA FPEF MS (Fluid Physics Experiment Facility/ Marangoni Surface) hardware last week, FE-2 Chamitoff today continued JMP (JEM Pressurized Module) preparations for Kibo's first experiment by completing several FPEF post-launch reconfigurations plus checkout, preparatory to the scheduled start of the Marangoni experiment on 8/21 (Thursday). *[Reconfiguration proceeded in six steps: Installing MS in FPEF, installing the IR (Infrared) camera on FPEF & connecting harnesses, installing FPEF experiment cover body, connecting the 1553B cable & silicone hoses between FPEF and the silicone filter, with rack power switch set on normal, and removing MS MWA I/F A & B (Maintenance Work Area Interface A & B) from MWA, plus relocating the MWA.]*

Afterwards, Chamitoff configured the required cables connections for CBEF (Cell Biology Experiment Facility) and FPEF, removing the video cables between CBEF and the IPU Image Processing Unit) as well as between the SCOF (Solution Crystallization Observation Facility) and the IPU, also the payload bus cable between SCOF and its ISPR UIP (International Standard Payload Rack Utility Interface Panel), then connecting the FPEF by video cables to the IPU and by payload bus cable to the ISPR UIP.

Also in the JPM, the FE-2 activated the MMA (Microgravity Measurement Apparatus) and its laptop (MLT), by first powering up the MMA's NCU/RSU (Network Control Unit/Remote Sensor Unit) set from the Ryutai rack's UDC (Utility DC to DC Converter), then turning on both the NCU/RSU and MLT.

CDR Volkov set up the geophysical GFI-1 Relaksatsiya ("relaxation") payload's SONY DCR camcorder at Service Module (SM) window #1 (port crew cabin). Purpose of today's ~2.5hr exercise was to calibrate the LCD (Liquid Crystal Display)-equipped camcorder with known observation targets, viz., stars of the constellation Cygnus (Swan). Afterwards the camcorder battery was re-charged and the equipment re-stowed. *[Relaksatsiya normally deals with the study of the chemoluminescent chemical reactions and atmospheric light phenomena (emissions, i.e., molecular relaxation processes), including those that occur during high-velocity interaction between the exhaust products from space vehicles and the atmosphere at orbital altitude and during the entry of space vehicles into the Earth's upper atmosphere.]*

The FE-2 performed CSA-CP (Compound Specific Analyzer-Combustion Products)

maintenance, first replacing the battery of the prime CSA-CP unit with a fresh spare, then performing visual & functional inspections of the CSA-CP probes for damage, using the sampling pumps in Node-1 and -2 for the checkup.

After yesterday's equipment preparations in the US Lab for setting up an A31p laptop that can be used as a remote RS CP (Central Post) computer, Volkov & Kononenko today installed the laptop and connected it to the RS Command & Data Handling System (SUBA). The new Ethernet connection was tested by Oleg afterwards, and a system test of the A31p setup is scheduled tomorrow. *[The Remote RS A31p laptop in the Lab is now connected via Ethernet and the BRI Smart Switch Router to the RS1 laptop and thus to the KTsP1 (Central Post Computer 1) in the SM. BRI is part of the RS OpsLAN network with connections to the three RS SSC (Station Support Computer) clients, the Ethernet tie-in with the US network, a network printer in the RS, and now also to the Remote US CP client.]*)

For the external VSPLESK ("Burst") science payload installed during EVA-20 by Volkov & Kononenko on 7/15, Oleg connected two jumper cables to two array matching devices (USM) for the onboard data/telemetry system, with the BITS2-12 onboard telemetry measurement system temporarily deactivated (which also required the Elektron oxygen generator to be turned off). *[VSPLESK, along with the BTN-M1 "NEUTRON" science payload, will create a physical model of charged and neutral particles generated during solar bursts and of the neutron albedo of the Earth atmosphere considering solar and geophysical aspects.]*

Afterwards, the Elektron O_2 generator was activated at 32 amps, supported by Oleg monitoring the external temperature of its secondary purification unit (BD) for the first 10 minutes of operations to ensure that there is no overheating. In support of the reactivation, at ~6:22am EDT the ground temporarily switched the ATV (Automated Transfer Vehicle) to autonomous power (i.e., disconnected it electrically from ISS) and later reconfigured it to ISS power. *[During nominal Elektron operations a gas analyzer is utilized to detect hydrogen (H_2) in the O_2 line (which could cause overheating) but is not included in the control algorithm until 10 minutes after Elektron startup.]*

Sergey Volkov installed newly delivered extension springs on spare quick-release screw clamps (ZVB) for the standard Russian SSVP-StM docking mechanism.

In the U.S. Airlock (A/L), Chamitoff terminated the maintenance discharge on the second of two EMU (Extravehicular Mobility Unit) batteries (#2073) and started its recharge. *[Since the due date for the regular 85-day maintenance has expired, an additional maintenance cycle is required after the battery's discharge. The periodic*

maintenance consists of fully discharging (and later recharging) the storage units to prolong their useful life. After end of the maintenance cycle, Greg restored the SSC laptop, which is used in DOS mode for the automated procedure, to nominal ops. Yesterday's OCV (Open Circuit Voltage) check on EMU battery #2071 showed 13.4 volts, indicating a shorted cell within the battery. As a result of this finding, the formerly suspect BCM-4 (Battery Charger Module 4) has been cleared for nominal use.]

Gregory also completed the regular 30-day inspection of the new AED (Automated External Defibrillator) in the CHeCS (Crew Health Care Systems) rack. *[The AED is a portable electronic device that automatically diagnoses the potentially life threatening cardiac arrhythmias of ventricular fibrillation and ventricular tachycardia in a patient. It then can treat them through defibrillation, i.e., the application of electrical therapy which stops the arrhythmia, allowing the heart to reestablish an effective rhythm. AEDs are generally either held by trained personnel who will attend events or are public access units which can be found in places including corporate and government offices, shopping centers, airports, restaurants, casinos, hotels, sports stadiums, schools and universities, community centers, fitness centers, health clubs and any other location where people may congregate.]*

As a JAXA EPO (Educational Payload Operation) task, at ~11:00am EDT, at the moment of moonrise for the ISS, the FE-2 watched the Moon from the JPM window and took photography as it rose, including briefly through the upper atmosphere layers. *[As per Greg: In the future, this should be timelined a bit earlier to allow for preparation of the shoot.]*

Sergey conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Oleg performed the daily IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Gregory had another 55 min reserved for ATV cargo transfers, i.e., moving consumables to the ISS via the SM and loading trash & excessed equipment on "Jules Verne".

Kononenko unstowed and installed the equipment for the periodic Russian PZE-MO-10 "Hematokrit" testing which is scheduled for him and CDR Volkov tomorrow. *[MO-10 measures the hematocrit (red blood cell mass) value of the blood (it is a*

well-known phenomenon of space flight that red blood cell mass {normal range: 30-45%} tends to go down over time).]

The crew had their periodic PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Oleg at ~11:20am, Sergey at ~11:50am, Greg at ~2:30pm EDT.

The three station residents conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Oleg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control ppCO_2 levels. In this configuration for the daily ops, connecting & disconnecting the ITCS (Internal Thermal Control System) cooling loop is not required. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking.]*

At ~11:35am, the FE-2 powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, & power supply) and conducted, at 11:40am, a ham radio exchange with the Los Padres Council Boy Scouts Troop 105 of Santa Barbara, CA. Troop 105 is based in Goleta, California, founded in 1967. The troop belongs to the South Coast District of the Los Padres Council. Its monthly program includes weekly meetings and monthly outings, participation in the annual district Camporee and attendance at a week-long summer camp. It also performs service for its community and its sponsor, the St. Raphael Catholic Church and the Knights of Columbus. Questions to Greg were uplinked beforehand. *["What is your favorite experiment on the space station?"; "What kind of computer do you have available to use on the space station?"; "How long do plants live in a space environment?"; "Can you tell us what weightlessness is like?"; "What does the food taste like?"; "What kind of shapes can you make with liquids in weightlessness?"; "How much sleep do you get?"; "What do you do when you get bored?"; "How did scouting help you in your career?"]*

SHERE Feedback: "Greg, once again, outstanding work on SHERE! Getting four test points done plus the three repeats was really, really exciting. Thank you very much for the excellent science!"

VolSci Program Preview: For the weekend of August 23, Greg Chamitoff was offered two choices for the Voluntary Weekend Science program: (1) an "operations improvement" session with SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellites) with all three satellites, requiring ~4 hrs crew time; and (2) a LOCAD PTS (Lab-On-A-Chip Application Development – Portable Test System) surface sampling session in COL (Columbus Orbital Laboratory) using Glucan LAL cartridges, targeting fungus on ISS surfaces, requiring ~1h 45m crew time.

CEO (Crew Earth Observations) photo targets uplinked for today were **Hurricane Fay, Florida** *(Dynamic event. Fay was expected to be a minimal hurricane by the time of this pass, tracking north up the west coast of Florida. Second opportunity at 4:40pm. The earlier opportunity may have had the better viewing angle, with sunrise back-lighting. ISS passed close to the expected center over Fort Myers. Looking forward on the approach from the Yucatan peninsula),* **Tunis, Tunisia** *(shooting left at the head of a major bay for this ancient city. City margins are of greatest interest),* **Libyan megafans** *(overlapping images at nadir were requested as ISS passed directly above this site. A network of streams has created a vast plain of sediments deriving from the Tibesti Mountains hundreds of kilometers to the south. These streams stopped flowing at the end of the last wet period in the Sahara ~6000 years ago. Megafans are proving to be a feasible model for several regional Martian landscapes),* and **Algerian megafan** *(detailed overlapping images along track and just left of track were requested [immediately after ISS crossed a prominent field of parallel sand dunes] to allow researchers to understand more about the behavior of streams on this large, recently discovered feature. Visual cues are networks of parallel dry stream beds).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 18 Scheduled Main Activities:

- Wed. (8/20): Ku-Band Forward Receiver Relocation & Checkout; Ground Strap/Pivot Fitting install in JPM; MO-10 (all); CGBA-4/CGBA-5 subrack relocation; PFE-OUM setup & prep.
- Thu. (8/21): LULIN dosimeter placement; EMU Battery maint.; PFE-OUM ops; BKS cabling outfit for Zveno (Link) unit; DOUG revw/prep for JEMRMS Checkout #4; COL Cycle 11 transition for PWS-1; WRM/CWC water audit.
- Fri. (8/22): EMU batt. #2073 maint.; BKS cabling for Zveno (Link); Zveno unit install in ZVK LIV exp. video complex; RSE-2 laptop set-up for Zveno; PEPS inspect/checkout; Elektron BZh unit #56 leak check; Elektron On; JEMRMS

Checkout #4; GANK & CDMK reading; Progress M-64 SSVP-StM docking mechanism install.

- Sat. (8/23): Station cleaning (RS); BMP ch.1 regen; PFCs (CDR, FE-1); VolSci.
- Sun. (8/24): Station cleaning (USOS); BMP ch.2 regen; PFC (FE-2).

ISS Orbit (as of this morning, 8:56am EDT [= epoch]):
Mean altitude -- 355.9 km
Apogee height -- 361.6 km
Perigee height -- 350.2 km
Period -- 91.66 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0008394
Solar Beta Angle -- -38.7 deg (magnitude peaking)
Orbits per 24-hr. day -- 15.71
Mean altitude loss in the last 24 hours -- 45 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55850

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/01/08 -- Progress M-64/29P undocking, from FGB nadir; de-orbit/re-entry ~9/8
09/05/08 -- ATV1 undocking, from SM aft port (loiter until 9/29 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) or 10/24?
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)

03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/18/08
Date:	Monday, August 18, 2008 12:56:55 PM
Attachments:	

ISS On-Orbit Status 08/18/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 18 of Increment 17.*

Volkov, Kononenko and Chamitoff began their workday before breakfast with the periodic session of the Russian biomedical routine assessments PZEh-MO-7/Calf Volume Measurement & PZEh-MO-8/Body Mass Measurement, using the IM mass measurement device which Sergey Volkov broke down afterwards for stowage. *[Calf measurements (left leg only) are taken with the IZOG device, a custom-sewn fabric cuff that fits over the calf, using the knee and lower foot as fixed reference pints, to provide a rough index of deconditioning in zero-G and effectiveness of countermeasures. For determining body mass in zero-G, where things are weightless but not massless, the Russian IM "scales" measure the inertial forces that arise during the oscillatory motion of a mass driven by two helical metering springs with known spring constants. By measuring the time period of each oscillation of the unknown mass (the crewmember) and comparing it to the period of a known mass, the crewmember's mass is calculated by the computer and displayed.]*

FE-1 Kononenko serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out"-to-vacuum cycle on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~5:15pm EDT. Filter bed #1 was regenerated yesterday. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time: 8/5 & 8/6).]*

Sergey & Oleg undertook their fourth periodic (generally monthly) health test with the cardiological experiment PZEh MO-1 ("Study of the Bioelectric Activity of the Heart at Rest") on the TVIS (Treadmill with Vibration Isolation System). *[During the 50-min. test, the crewmembers tagged up with ground specialists on an RGS*

(Russian ground site) pass (~6:52am EDT) via VHF and downlinked data from the Gamma-1M ECG (electrocardiograph) for about 5-6 minutes.]

Chamitoff retrieved an RF cable from stowage and readied it in the Lab for Wednesday's relocation of the Ku-band forward receiver. *[The Ku receiver will be relocated on 8/20 from ER-4 (EXPRESS Rack 4) to ER-2 and checked out. ER-4 & ER-5 will be relocated in the near future.]*

On ER-4, Gregory also terminated ANITA (Analyzing Interferometer for Ambient Air) sampling mode, deactivated the ANITA hardware and stowed it for return to the ground on ULF2 (STS-126/Endeavour), preparatory to the planned ER-4/ER-5 relocation. *[Note: CGBA-4 (Commercial Generic Bioprocessing Apparatus 4) in ER-4 was deactivated by the ground for its relocation to ER-1 on Wednesday. CGBA-5 will also be relocated on 8/20, to ER-2.]*

The CDR & FE-1 prepared the worksites, equipment and cabling for tomorrow's installation and connecting of an A31p laptop in the U.S. Lab as Remote RS (Russian Segment) Central Post computer. *[Software to enable the laptop to operate with Russian software Vers. 7.05 has already been installed.]*

At the TVIS treadmill, the FE-2 took additional documentary photography of the improvised patch repair of the running belt and four shifted belt plates above the patch, for the ground to verify integrity of the IFM (Inflight Maintenance) conducted last week.

In the U.S. Airlock (A/L), Chamitoff initiated maintenance discharge on the first of two EMU (Extravehicular Mobility Unit) batteries (#2071) and ran the process later also on the second (#2073). *[The periodic maintenance consists of fully discharging (and later recharging) the storage units to prolong their useful life. After end of the maintenance cycle, Greg restored the SSC laptop, which is used in DOS mode for the automated procedure, to nominal ops.]*

After Saturday's VolSci (Voluntary Weekend Science) program featuring SHERE (Shear History Extensional Rheology Experiment), Chamitoff today conducted another SHERE session, by –

- Activating the MSG (Microgravity Science Glovebox),
- Powering on the SHERE hardware,
- Accessing the CGBA (Commercial Generic Bioprocessing Apparatus) to install the SHERE FM (Fluid Module) #4;
- Supporting the first SHERE experiment run (Test Point 18);
- Transferring the module with the fluid sample,
- Installing FM #17 for the second experiment run (Test Point 10);
- Repeating the procedure on TP 10;

- Transferring the module with the fluid sample;
- Installing FM #2 for the third experiment run (Test Point 20) if time permitted;
- Removing the FM from the CGBA, followed by SHERE data transfer;
- Turning off the SHERE/CGBA equipment;
- Transferring the data files to the MSG laptop, and
- Powering down the MSG.

[Background: Rheology is the study of the deformation and flow of matter under the influence of an applied stress ("preshearing" = rotation) which might be, for example, a shear stress or extensional stress. In practice, rheology is principally concerned with extending the "classical" disciplines of elasticity and (Newtonian) fluid mechanics to materials whose mechanical behavior cannot be described with the classical theories. SHERE is designed to study the effect of preshear (rotation) on the transient evolution of the microstructure and viscoelastic tensile stresses for solutions with long chains of monodisperse dilute polymer molecules in the MSG. Collectively referred to as "Boger fluids," these polymer solutions have become a popular choice for rheological studies of non-Newtonian fluids and are the non-Newtonian fluid used in this experiment. The SHERE hardware consists of the Rheometer, Camera Arm, Interface Box, Cabling, Keyboard, Tool Box, Fluid Modules, and Stowage Tray.]

CDR Volkov conducted the periodic (about twice a month) replenishing of the Elektron oxygen generator's water supply for electrolysis, filling the KOV EDV container with water collected in a CWC (Contingency Water Container) from the Lab CCAA (Common Cabin Air Assembly) dehumidifier. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron shutdown.]*

In preparation for tomorrow's planned session with the geophysical GFI-1 Relaksatsiya ("relaxation") experiment, Sergey started (later terminated) battery charging for the SONY DCR digital camcorder. *[Relaksatsiya normally deals with the study of the chemoluminescent chemical reactions and atmospheric light phenomena (emissions, i.e., molecular relaxation processes), including those that occur during high-velocity interaction between the exhaust products from space vehicles and the atmosphere at orbital altitude and during the entry of space vehicles into the Earth's upper atmosphere.]*

At ~9:10am EDT, the crew held a teleconference with ground specialists to discuss ATV (Automated Transfer Vehicle) cargo transfers, to be occurring primarily this week and next week. Today's schedule provided for ~2h 50m of transfer time. *[Originally estimated to require ~41 hrs of crew time, MCC-H specialists have been able to scrub the time for the transfers down to ~31 hrs, including moving major consumables to the ISS besides loading trash & excessed equipment on*

"Jules Verne".]

For a ground-controlled checkout of the JAXA FPEF (Fluid Physics Experiment Facility) and the upcoming Marangoni convection experiments, Gregory turned on the gas supply from the CGSE (Common Gas Support Equipment) in the JPM (JEM Pressurized Module). *[The CGSE consists of a valve unit and four CO_2 & Argon GBUs (gas bottle units).]*

Sergey conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The CDR also performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Oleg Kononenko performed the periodic recharge of the water tank for the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}). The regular status check was also conducted, from the Russian discretionary "time permitting" task list.

At 2:30pm EDT, Greg is scheduled to support the periodic VHF-1 emergency communications check over NASA's VHF (Very High Frequency) stations, today at the Wallops (2:34pm-2:40pm), talking with Houston/Capcom, MSFC/PAYCOM (Payload Operation & Integration Center Communicator), Moscow/GLAVNI (TsUP Capcom), EUROCOM and JCOM in the normal fashion via VHF radio from a handheld microphone and any of the USOS ATUs (Audio Terminal Units). *[Purpose of the test is to verify signal reception and link integrity, improve crew proficiency, and ensure minimum required link margin during emergency (no TDRS) and special events (such as a Soyuz relocation).]*

The three station residents conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1). Later, Oleg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure

on the HRM storage medium (done six times a week).

As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control ppCO_2 levels. In this configuration for the daily ops, connecting & disconnecting the ITCS (Internal Thermal Control System) cooling loop is not required. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking.]*

SOTR KOB-1 Maintenance Update: Volkov's attempt to drain coolant from the #1 loop (KOB-1) of the Russian Thermal Control System (SOTR) in the SM failed last Friday (8/15). The intended pressure check at various valve settings could not be performed. The issue is being investigated. *[Purpose of the attempted coolant draining was to determine the volume of free air in KOB-1 and check the leak tightness of the KOB-1 accumulator bellows; also: to perform preventive maintenance on the SOTR loops' solenoid valves.]*

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 18 Scheduled Main Activities:

- Tue. (8/19): AED Defib inspect; 85 Day Maint Initiate for EMU Battery 2071; VHF Emergency Comm Checkout; Rack Hardware Installation Prep; MO-9; NOA1; CSA-CP maint.; SM CP laptop install in USOS Lab; Extension springs install on spare ZVB quick-release screw clamps;
- Wed. (8/20): Ku-Band Forward Receiver Relocation & Checkout; Ground Strap/Pivot Fitting install in JPM; MO-10 (all); CGBA-4/CGBA-5 subrack relocation; PFE-OUM setup & prep.
- Thu. (8/21): LULIN dosimeter placement; EMU Battery maint.; PFE-OUM ops; BKS cabling outfit for Zveno (Link) unit; DOUG revw/prep for JEMRMS Checkout #4; COL Cycle 11 transition for PWS-1; WRM/CWC water audit.
- Fri. (8/22): EMU batt. #2073 maint.; BKS cabling for Zveno (Link); Zveno unit install in ZVK LIV exp. video complex; RSE-2 laptop set-up for Zveno; PEPS inspect/checkout; Elektron BZh unit #56 leak check; Elektron On; JEMRMS Checkout #4; GANK & CDMK reading; Progress M-64 SSVP-StM docking mechanism install.

ISS Orbit (as of this morning, 6:51am EDT [= epoch]):
Mean altitude -- 356.0 km

Apogee height -- 361.6 km
Perigee height -- 350.3 km
Period -- 91.66 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0008343
Solar Beta Angle -- -38.7 deg (magnitude peaking)
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Mean altitude loss in the last 24 hours -- 45 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55833

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
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09/07/08 -- ATV1 undocking, from SM aft port (loiter until 9/29 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
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11/12/08 -- STS-126/Endeavour/ULF2 docking
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02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
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04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation

10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/17/08
Date:	Sunday, August 17, 2008 12:54:10 PM
Attachments:	

ISS On-Orbit Status 08/17/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – rest day for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff. Ahead: Week 18 of Increment 17.*

Gregory Chamitoff started out with the week-long experiment SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight), using payload software for data logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop. *[To monitor the crewmember's sleep/wake patterns and light exposure, Chamitoff wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

The FE-2 had three hours reserved for the regular weekly station cleaning in the USOS (US Segment) which wasn't scheduled yesterday alongside the RS (Russian Segment) "uborka" housecleaning by his two crewmates.

Greg repeated the "ghosting" of the SAMS ICU (Space Acceleration Measurement System/Interim Control Unit) laptop hard drive in the LAP2 Rack with new software image/structure. *[The ICU stalled out yesterday during the uploading, and new instructions were uplinked overnight.]*

CDR Volkov meanwhile performed the periodic service of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system, and to terminate the process at ~3:30pm EDT, with Bed #2 regeneration to follow tomorrow *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time: 8/5 & 8/6)];*

Sergey conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The CDR also checked up on the Russian POTOK-150MK (150 micron) decontamination filter unit of the SM's SOGS air revitalization subsystem, gathering weekly data on Total Operating Time & "On" durations for reporting to TsUP-Moscow.

The three station residents conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

As per the Russian voluntary "time permitting" task list, Oleg performed the regular status check on the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}) and recharged its water tank.

A new suggested job for Gregory on the U.S. crewmember's-choice "job jar" task list was to check out the BIOLAB ESEM3-2 (Exchangeable Standard Electronic Module 3-2) power board in the Columbus laboratory preparatory to the troubleshooting activities planned by ESA to recover all BIOLAB functionalities.

Meanwhile, "Cycle 11" software transition checkouts of Columbus systems are continuing, by ground control only.

As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control ppCO_2 levels. In this configuration for the daily ops, connecting & disconnecting the ITCS (Internal Thermal Control System) cooling loop is not required. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking.]*

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 18 Scheduled Main Activities:

- Mon. (8/18): MO-7/MO-8 (all); BMP ch.2 regen; MO-1; ATV transfers; SHERE session; RED+Accessories inspect; EMU Battery 2071 discharge (BSA Ops).
- Tue. (8/19): AED Defib inspect; 85 Day Maint Initiate for EMU Battery 2071; VHF Emergency Comm Checkout; Rack Hardware Installation Prep; MO-9; NOA1; CSA-CP maint.; SSVP BZV docking & internal transfer system/screw clamps ops.
- Wed. (8/20): ANITA deactivation & stow; Ku-Band Forward Receiver Relocation & Checkout; Ground Strap/Pivot Fitting install in JPM; MO-10 (all); PFE-OUM setup & prep.
- Thu. (8/21): LULIN dosimeter placement; EMU Battery maint.; PFE-OUM ops; BKS cabling outfit for Zveno (Link) unit; DOUG revw/prep for JEMRMS Checkout #4; COL Cycle 11 transition for PWS-1; WRM/CWC water audit.
- Fri. (8/22): EMU batt. #2073 maint.; BKS cabling for Zveno (Link); Install new Zveno unit in ZVK LIV exp. video complex; RSE-2 laptop set-up for Zveno; PEPS inspect/checkout; Elektron BZh unit #56 leak check; Elektron On; JEMRMS Checkout #4; GANK & CDMK reading; Progress M-64 SSVP-StM docking mechanism install.

ISS Orbit (as of this morning, 9:18am EDT [= epoch]):
Mean altitude -- 356.0 km
Apogee height -- 361.6 km
Perigee height -- 350.4 km
Period -- 91.66 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0008351
Solar Beta Angle -- -38.1 deg (magnitude increasing, approaching peak)
Orbits per 24-hr. day -- 15.71
Mean altitude loss in the last 24 hours -- 31 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55819

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/02/08 -- Progress M-64/29P undocking, from FGB nadir
09/07/08 -- ATV1 undocking, from SM aft port (loiter until 9/29 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft)

10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT; Lonchakov, Fincke, Garriott)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) or 10/24?
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/16/08
Date:	Saturday, August 16, 2008 3:20:10 PM
Attachments:	

ISS On-Orbit Status 08/16/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – mostly off duty for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff.*

Chamitoff began his day with the week-long experiment SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight), using payload software for data logging and filling in questionnaire entries in the experiment's session file on the HRF-1 laptop. *[To monitor the crewmember's sleep/wake patterns and light exposure, Greg wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Volkov & Kononenko performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the SM (Service Module) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

The FE-1 also checked up on the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem, gathering weekly data on Total Operating Time & "On" durations for reporting to TsUP-Moscow. Later, CDR Volkov temporarily powered down the POTOK for the periodic cleaning of its pre-filter, using the vacuum cleaner with narrow-slit nozzle attachment.

Working on the SAMS ICU (Space Acceleration Measurement System/Interim Control Unit) in LAP2 Rack, Gregory initiated, and about three hours later

terminated, the software “ghosting” of the SAMS hard drive, i.e., loading it with new images/structure.

At ~10:05am EDT, the crewmembers conducted their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP-Moscow timeline planners) via S-band/ audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

For today’s VolSci (Voluntary Weekend Science) program, another session with SHERE (Shear History Extensional Rheology Experiment), FE-2 Chamitoff –

- Activated the MSG (Microgravity Science Glovebox),
- Powered on the SHERE hardware,
- Accessed the CGBA (Commercial Generic Bioprocessing Apparatus) to install the SHERE FM (Fluid Module) #15;
- Supported the first SHERE experiment run (Test Point 11);
- Repeated the procedure on TP 11 (the first repetition, suggested by Greg last week);
- Transferred the module with the fluid sample,
- Installed FM #18 for the second experiment run (Test Point 21) , but with reduced preshear duration, now TP 26;
- Transferred the module with the fluid sample,
- Installed FM #22 for the third experiment run (Test Point 8);
- Repeated the procedure on TP 8;
- Removed the FM from the CGBA, followed by SHERE data transfer;
- Turned off the SHERE/CGBA equipment;
- Transferred the data files to the MSG laptop, and
- Powered down the MSG.

[Background: Rheology is the study of the deformation and flow of matter under the influence of an applied stress (“preshearing” = rotation) which might be, for example, a shear stress or extensional stress. In practice, rheology is principally concerned with extending the "classical" disciplines of elasticity and (Newtonian) fluid mechanics to materials whose mechanical behavior cannot be described with the classical theories. SHERE is designed to study the effect of preshear (rotation) on the transient evolution of the microstructure and viscoelastic tensile stresses for solutions with long chains of monodisperse dilute polymer molecules in the MSG. Collectively referred to as “Boger fluids,” these polymer solutions have become a popular choice for rheological studies of non-Newtonian fluids and are the non-Newtonian fluid used in this experiment. The SHERE hardware consists of the Rheometer, Camera Arm, Interface Box, Cabling, Keyboard, Tool Box, Fluid Modules, and Stowage Tray.]

Kononenko performed the routine daily servicing of the SOZh system (Environment

Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Gregory filled out the regular FFQ (Food Frequency Questionnaire), his ninth, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

The three station residents conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Greg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure
on the HRM storage medium (done six times a week).

The two cosmonauts had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Oleg at ~7:00am EDT, Sergey at ~8:10am.

Working from the voluntary “time permitting” task list, Oleg performed the regular status check on the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}) and recharged its water tank.

As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control $ppCO_2$ levels. In this configuration for the daily ops, connecting & disconnecting the ITCS (Internal Thermal Control System) cooling loop is not required. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking.]*

Weekly Science Update *(Expedition Seventeen -- Week 17)*

3-D SPACE: In progress.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Measurements continue in FGB module.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-2/CGBA-5 (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus 5): Silicate Garden Hab Side 2 is complete and CGBA-5 has now been powered off awaiting its move to EXPRESS Rack 2 (ER2). The Hab along with other CSI-02 equipment will be removed and returned home on ULF2.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): EuTEF platform is nominal. A (DHPU) Data Handling Processing Unit software patch is currently being developed to fix the link error issues encountered with DEBIE-2 and FIPEX instruments. On 8/14, a graceful shutdown has been performed of EUTEF instruments in preparation of the S/W “Cycle 11” transition. EUTEF will stay on feeder#2 (survival heaters) for about 10 hours. Power-up sequence will be performed in the evening

of 8/14. - DEBIE-2: IOPs (Instrument Operations Procedures) performed for 24 hrs duration, from 8/9 until S/W “Cycle 11” power-down. Generic status: link error still in work. However a work-around allows for regular science data acquisition using an on-board IOP, but not yet in conjunction with any FIPEX IOP – a final software patch, which will enhance the present instrument capabilities, is under finalization on ground; - DOSTEL: On-going science acquisition until S/W Cycle 11 power-down; - EuTEMP: Currently inactive as planned; - EVC: Currently no picture taking; - EXPOSE: On-going science acquisition until S/W Cycle 11 power-down; - FIPEX: Science acquisition until 8/9. New FIPEX IOP currently planned to start on 8/15; - MEDET: Continuous science acquisition until S/W Cycle 11 power-down; - PLEGPAY: Currently in READY mode, no science data acquisition on-going, powered down for S/W Cycle 11; - TRIBOLAB: The instrument was in Stand-By Mode, now powered down for S/W Cycle 11. Currently planned to bring TRIBOLAB to Stand-By Mode on 8/17 and restart the Ball-Bearing experiment on 8/18.

FSL (Fluid Science Laboratory): FSL is back. Further FSL commissioning activities remain to be done (see following item).

GEOFLOW: After the very first Science Run on 8/7, data have been downlinked, and initially these files were corrupted. This could be resolved by downlinking at a lower data rate. The data have been transferred on 8/13 from COL-CC to MARS USOC and will be made available for science team assessment. Next GEOFLOW run is currently planned for 8/19.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Planned.

Micro-G Clay (JAXA EPO): On 8/11, Greg performed JAXA’s first EPO experiment, Micro-G Clay. The clays are in the drying process.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in

DC1 “Pirs”.

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-1/-2 (Nitric Oxide Analyzer, ESA): Next NOA-1 session for CDR and FE-1 currently planned for 8/19.

NUTRITION w/REPOSITORY: In progress.

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): *“*Greg, you completed test points TP#3, 13, 23, 5, 15, 25, and 1. We are two test points away from our minimum science of nine, which should be met during VolSci on 8/16. You have gotten very adept at deploying the Fluid Modules and performing the science runs. We would like you to continue to provide feedback on what you observe and to take advantage of repeat test points when the opportunity is available. Outstanding work!”

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): “Greg, thanks for completing your Sleep download and initialization. Your data continues to look great. Also, thanks for the crew note that you are removing your watch. That will help the PI with the analysis. After completing this week of sleep logging, you will have one more week of logging, three more monthly downloads, and then doffing the Actiwatch on the Shuttle. Additional sleep logging is above and beyond and greatly appreciated by the PI.”

SOLAR (Solar Monitoring Observatory): Previous Sun observation window closed on 8/8. On 8/14, a shutdown has been performed of SOLAR instruments in preparation of the S/W Cycle 11 transition. SOLAR will stay on feeder#2 (survival heaters) for about 10 hours. Power-up will be performed in the evening of 8/14. Next Sun visibility window to open on 8/25.

SOLO: Planned.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): A troubleshooting plan has been developed to recover all the BIOLAB functionalities. On 8/4, BIOLAB has been activated from ground for about 5 hours, in order to get telemetry about the Smoke Detector sensor and perform a series of BIT (Built-In Test) sequences. This test was positive and we can confirm the full functionality of the Smoke Detector sensor. Next steps will be resumed in the next coming weeks, starting with the BIOLAB Rotor A bellow test (ground only) and later on the remaining WAICO-#1ECs (Experiment Containers) will be disposed and replaced by 6 Reference ECs on Rotor B. Planning for this last activity is currently TBD.

CEO (Crew Earth Observations): Through 8/7 the ground has received a total of 4,220 frames of CEO images for review and cataloging. Photos acquired with camera times corresponding to those of the CEO daily target list requests, included: S. Mozambique (Mount Vesuvius – good context views as requested); and Haze SE USA (this dynamic event apparently was not as discernible as was hoped). "We encourage you to continue to practice with the long lens settings to improve consistency in the sharpness/focus of your images. Coastlines, urban, and other high-contrast areas shot in high sunlight conditions make good practice targets, especially when near-nadir. This week we will publish on NASA/GSFC's Earth Observatory website an excellent, rare photo of the Dry Tortugas, Florida that was on 5/29. The image area is part of remote national park located west of Key West and includes a recognizable view of Fort Jefferson, a hexagonal-shaped, Civil War era, fortification."

CEO (Crew Earth Observations) photo targets uplinked for today were **Algerian megafan** *(a large river-formed fan-shaped inland delta/megafan [210 km radius], formed by a river during wetter climates, was recently identified in the western Sahara Desert. Detailed overlapping images along track and just right of track were requested to allow researchers to understand more about the behavior of streams on these large features. Visual cues are: numerous parallel dry stream beds right of track; and a field of linear sand dunes left of track. The significance of megafans has only recently been appreciated since more than 150 have been identified worldwide. Large fans are being tested as new analogs for many landscapes on*

Mars), **Northern Temperate Lakes, Wisconsin** *(this Long-Term Ecological Research [LTER] site concerns the ecology of lakes in relation to seasonal changes and nearby human processes. Detailed overlapping images along track at nadir [starting shortly after ISS crossed the Mississippi River] acquire the several lakes and their surrounding landscapes as a high-summer data point),* and **West Hawk Impact Crater, Manitoba, Canada** *(this 2.5-km-diameter crater is occupied by a lake. Visual cues: this is the only roughly circular lake in the region, and it lies just north of a long narrow lake).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 17/18 Main Activities:

- Sun. (8/17): Rest; BMP ch.1 regen; Weekly house cleaning (USOS).
- Mon. (8/18): MO-7/MO-8 (all); BMP ch.2 regen; MO-1; ATV transfers; SHERE session; RED + Accessories inspect; EMU Battery 2071 discharge (BSA Ops).
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07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/15/08
Date:	Friday, August 15, 2008 1:27:01 PM
Attachments:	

ISS On-Orbit Status 08/15/08

All ISS systems continue to function nominally, except those noted previously or below.

Gregory Chamitoff began his day with the week-long experiment SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight), using payload software for data logging and filling in questionnaire entries in the experiment's session file on the HRF-1 laptop. *[To monitor the crewmember's sleep/wake patterns and light exposure, Greg wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Working closely with the ground, FE-2 Chamitoff conducted the JAXA JEMRMS (Japanese Experiment Module/Robotic Manipulator System) Checkout #3 which featured the first motion of its Main Arm in space. The maneuvers were observed by the SSRMS (Space Station Remote Manipulator System) video cameras. *[After activating the RLT (RMS Laptop), CCP (Camera Control Panel) and RMS Monitors, and adjusting settings including updating the DOUG (Dynamic Onboard Ubiquitous Graphics) laptop application with realtime data, RMS function was checked out for manual operation in vernier mode, with the EE (End Effector) in stowed position. Following these checkouts, the RMS was to be moved to the JLP GP (JEM Logistics Pressurized Section Grapple Fixture) for EE checkout and verification of RMS characteristics when in Limp Mode. Afterwards, data were to be prepared for downlink, the Arm Bus Monitor turned off, MDP (Management Data Processor) set to Standby and all systems deactivated. Background: The externally mounted JEMRMS is composed of two arms: the 10-m-long MA (Main Arm) and a 2-m-long small fine arm (the latter to be delivered on a future mission). Both arms have six independent joints, to provide dexterity very similar to the human arm. The internal robotic control workstation, known as JEMRMS Console, is used for manipulating the RMS. Remote television cameras are mounted on both*

arms, enabling the crew to control the arms from inside the JPM.]

In preparation for an upcoming JEM rack relocation, Chamitoff also had an hour set aside (plus additional time called out on his discretionary “job jar” task list) for an extensive Kibo cleanup, guided by an uplinked listing with specific items, instructions and locations. *[The activities include relocating JAXA items from COL (Columbus Orbital Laboratory) and Node-2 to JPM (JEM Pressurized Module) and JLP, unpacking or stowing numerous bags, configuring the stowage in JPM & JLP locations and taking documentary photography of all areas involved.]*

CDR Volkov set up the hardware for the Russian MBI-21 PNEVMOKARD experiment and conducted the session, his third, which does not allow moving or talking during data recording. The experiment is controlled from the RSE-Med A31p laptop, equipped with new software, and uses the TENZOPLUS sphygmomanometer to measure arterial blood pressure. Kononenko’s third session was on 8/11. *[PNEVMOKARD (Pneumocard) attempts to obtain new scientific information to refine the understanding about the mechanisms used by the cardiorespiratory system and the whole body organism to spaceflight conditions. By recording (on PCMCIA cards) the crewmember’s electrocardiogram, impedance cardiogram, low-frequency phonocardiogram (seismocardiogram), pneumotachogram (using nose temperature sensors), and finger photoplethismogram, the experiment supports integrated studies of (1) the cardiovascular system and its adaptation mechanisms in various phases of a long-duration mission, (2) the synchronization of heart activity and breathing factors, as well as the cardiorespiratory system control processes based on the variability rate of physiological parameters, and (3) the interconnection between the cardiorespiratory system during a long-duration mission and the tolerance of orthostatic & physical activities at the beginning of readaptation for predicting possible reactions of the crewmembers organism during the their return to ground.]*

In the Lab, FE-1 Kononenko worked on ER4 (EXPRESS Rack 4), troubleshooting the ANITA (Analyzing Interferometer for Ambient Air) payload, to recover its laptop. *[The ANITA air sampling equipment will be returned on STS-126/ULF-2.]*

It was Oleg’s turn today for his first session with the Russian biomedical "Pilot-M"/ NEURO signal response experiment, assisted by Volkov (who underwent the assessment yesterday) and ground specialist tagup via S-band. Afterwards, the Pilot-M & Neurolab-2000M gear was torn down and stowed away. *[MBI-15 requires a table, ankle restraint system, electrodes, and two hand controllers (RUO & RUD) for testing piloting skill in “flying” simulations on a laptop (RSK1) under stopwatch control, as well as for studying special features of the psychophysiologic response of cosmonauts to the effects of stress factors in flight.]*

Sergey Volkov performed maintenance on the #1 loop (KOB-1) of the Russian Thermal Control System (SOTR) in the Service Module (SM), using a manual pump, hose adapters and a pressure gauge (VK-316M) to drain coolant and check pressures at various valve settings. Afterwards, the loop's initial status was restored. Last time done: 5/30. *[Purpose: to determine the volume of free air in KOB-1 and check the leak tightness of the KOB-1 accumulator bellows; also: to perform preventive maintenance on the SOTR loops' solenoid valves.]*

The FE-2 took measurements for the regular atmospheric status check for $ppCO_2$ (Carbon Dioxide partial pressure) in the Lab, SM (at panel 449) and COL, using the hand-held CDMK (CO_2 Monitoring Kit, #1002). *[The battery pack was to be replaced with the one from unit #1009 if necessary. Purpose of the 5-min activity is to trend with MCA (Major Constituents Analyzer), i.e., to correlate the hand-held readings with MCA measurements.]*

Kononenko had another 3 hrs for transferring and loading excessed equipment and trash in Progress M-64/29P.

For today's physical workouts by all crewmembers on the RED (Resistive Exercise Device), Chamitoff set up the video camcorder for filming and recording the sessions via ground commanding. Afterwards, the video equipment was put back in stowage, and the video was to be downlinked from the VTR (Video Tape Recorder) by ground commanding. *[The RED video, showing the apparatus on the "ceiling" hatch of the Node, is periodically required to support biomechanical evaluation of the exercising crewmember and assessment of the on-orbit setup of equipment during data collection.*

As a follow-up to the TVIS repair/maintenance activities earlier this week, Kononenko was requested to take documentary photography of several running belt slats under tension, to be used as baseline for future weekly status checks to track possible changes in the repaired area of the treadmill belt.

The crew performed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Volkov transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week). *[The wireless POLAR S810 HRMs resemble sports wrist watches, with some of their features. They display the heart rate as BPM (beats per minute) and % of HRmax, average HR plus exercise duration, along with 7 different exercise*

profiles. The HR is transmitted from an elastic belt around the chest to the wrist receiver for subsequent downloading to the MEC and analysis by special software. Receiver settings are also uploaded from the laptop.]

After the ground performed the monthly reboots of the SM, Lab and JEM PCS (Portable Computer System) laptops today, Chamitoff closed their ISP Health Monitor Windows and configured them for nominal operations.

In the ESA COL, Gregory activated the PCDF EU (Protein Crystallization Diagnostic Facility/Electronics Unit) in support of the ongoing ground-commanded Columbus "Cycle 11" software transition. *[ESA ground controllers are currently monitoring the performance of Columbus systems with the new software. The remaining MMU (Mass Memory Unit) and PWS-1 (Portable Workstation) will be upgraded to Cycle 11 next week after a successful transition for all functionality has been verified.]*

The CDR conducted the routine daily servicing of the SM's SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Later, Sergey also performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Working from the voluntary "time permitting" task list, Oleg performed the regular status check on the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}) and recharged its water tank.

At ~4:20am EDT, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU/*Glavnaya operativnaya gruppa upravleniya* = *"Main Operative Control Group"*), including Shift Flight Director (SRP), at TsUP-Moscow via S-band/audio, phone-patched from Houston and Moscow.

At ~4:35am, Sergey & Oleg linked up with TsUP stowage specialists via S-band to conduct the weekly IMS tagup, discussing inventory & stowage issues, equipment locations and ATV & Progress cargo transfers.

At ~2:15pm, Greg Chamitoff is scheduled for an interactive PAO TV event with students at Outer Space Base (OSB) of the Pima County Public Library in Tucson,

AZ, attended also by U.S. Rep. Gabrielle Giffords (D-AZ) and STS-124 Commander Mark Kelly. Questions were uplinked beforehand. *["When you were chosen for Expedition 17, how did you feel?"; "In the year 2050 what would be your ideal goal for NASA?"; "Do you think children will ever be allowed to travel into space?"; "Will the space station ever be able to give supplies to the upcoming moon base?"]*

At ~3:35pm, the ISS crew will have their regular weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC (Station Support Computer)]*.

As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control ppCO_2 levels. In this configuration for the daily ops, connecting & disconnecting the ITCS (Internal Thermal Control System) cooling loop is not required. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking.]*

Node-2 SD-2 Update: Smoke detection in Node-2 has lost redundancy when Smoke Detector #2 in the module failed last night. SD-1 remains stable and nominal.

WRM Update: An updated WRM (Water Recovery Management) "cue card" was uplinked overnight for the crew's reference, updated with yesterday's water audit. *[The new card (17-0002V) lists 34 CWCs (Contingency Water Containers,~1204.3 L total) for the four types of water identified on board: technical water (426.5 L, for flushing only because of* Wautersia *bacteria), potable water (706.7 L, incl. 174.6 L currently on hold), condensate water (54.1 L), waste/EMU dump and other (17 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

CEO (Crew Earth Observations) photo targets uplinked for today were **Tropical Storm Fay, Caribbean Sea** *(Dynamic event. This storm is growing rapidly, moving WNW, and is expected to be over Puerto Rico, left of ISS track by the time of this pass. Reconnaissance aircraft was en route),* **Slate Islands Impact Crater, Lake Superior** *(the crater is in the form of a tight cluster of islands just off the north shore of L. Superior. A recent [8/4] CEO image was taken in low light, and another attempt was requested, this time for noon lighting),* and **Andrews Forest, Oregon** *(looking right of track for this long term monitoring site. Seasonal vegetation color and health are the topics of interest.)*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the

Earth from space, with 314,000 from the ISS alone).

Week 17/18 Main Activities:

- Sat. (8/16): SAMS Ghosting; Weekly house cleaning; VolSci.
- Sun. (8/17): Rest; BMP ch.1 regen; Weekly house cleaning (USOS).
- Mon. (8/18): MO-7/MO-8 (all); BMP ch.2 regen; MO-1; ATV transfers; SHERE session; RED + Accessories inspect; EMU Battery 2071 discharge (BSA Ops).
- Tue. (8/19): AED Defib inspect; 85 Day Maint Initiate for EMU Battery 2071; VHF Emergency Comm Checkout; Rack Hardware Installation Prep; MO-9; NOA1; CSA-CP maint.; SSVP BZV docking & internal transfer system/screw clamps ops.
- Wed. (8/20): ANITA deactivation and stow; Ku-Band Forward Receiver Relocation & Checkout; Ground Strap/Pivot Fitting install in JPM; MO-10 (all); PFE-OUM setup & prep.
- Thu. (8/21): LULIN dosimeter placement; EMU Battery maint.; PFE-OUM ops; BKS cabling outfitting; DOUG revw/prep for JEMRMS Checkout #4; COL Cycle 11 transition for PWS-1; WRM/CWC water audit.

ISS Orbit (as of this morning, 5:15am EDT [= epoch]):
Mean altitude -- 356.1 km
Apogee height -- 361.7 km
Perigee height -- 350.5 km
Period -- 91.66 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0008274
Solar Beta Angle -- -35.2 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.71
Mean altitude loss in the last 24 hours -- 12 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55785

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/02/08 -- Progress M-64/29P undocking, from FGB nadir
09/07/08 -- ATV1 undocking, from SM aft port (loiter until 9/29 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)

10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) or 10/24?
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/14/08
Date:	Thursday, August 14, 2008 3:10:55 PM
Attachments:	

ISS On-Orbit Status 08/14/08

All ISS systems continue to function nominally, except those noted previously or below.

Upon wake-up, CDRB Volkov terminated his eighth MBI-12 SONOKARD experiment session for the long-term Russian sleep study, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

FE-2 Chamitoff started his day with the week-long experiment SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight), using the payload software for data logging and filling in questionnaire entries in the experiment's session file on the HRF-1 laptop. *[To monitor the crewmember's sleep/wake patterns and light exposure, Greg wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Volkov and FE-1 Kononenko had about half an hour for cargo transfer activities from and to the ATV1 "Jules Verne" spacecraft. Based on an updated transfer list and return cargo schematics ("maps") as stowage guides, the activities include emptying dry cargo storage bags in the ATV and moving as many resupply items to the ISS as possible in the remaining time.

Later, Volkov and Kononenko also continued loading excessed equipment and trash in Progress M-64/29P.

In the JAXA Kibo JPM (JEM Pressurized Module), FE-2 Chamitoff made preparations for tomorrow's planned functional checkout #3 of the JEMRMS (Robotic Manipulator System), by –

- Activating the JEMRMS RLT (Robotics Laptop) to enable its new database uplinked earlier by controllers,
- Relocating SSC-14 (Station Support Computer 14) near the JEMRMS workstation and connecting it to the ISL (Integrated Station OpsLAN) via Ethernet cable for video ops during the checkout activities,
- Deactivating the RLT when the new database was enabled,
- Reconnecting the Robotics BDS (Backup Drive System) to the JEMRMS Bus Monitor laptop via cable from the BUC (Backup Controller),
- Connecting the BDS to UOP (Utility Outlet Panel) and configure it for BUC activation, and
- Conducting a DOUG review for the JEMRMS Checkout #3.

[Tomorrow's RMS checkout by Chamitoff will include a Manual Mode test, an EE (End Effector) test, a capture & release test of the JLP GF (JEM Logistics Pressurized Section/Grapple Fixture), and acquisition of data to characterize JEMRMS Limping Dynamics. Checkout #1 has been moved to September.]

Gregory also relocated the MMA (Microgravity Measurement Apparatus), removing its RSU (Remote Sensor Unit) from the Ryutai Rack AAA (Avionics Air Assembly) front surface and relocating the NCU (Network Control Unit), connected to the MLT (MMA Laptop Terminal), from the Saibo Rack to Ryutai.

In the ESA COL (Columbus Orbital Laboratory), the FE-2 worked on the FPEF (Fluid Physics Experiment Facility) to complete the assembly of the upcoming MS (Marangoni Surface) convection experiment (see yesterday's report for background details).

CDR Volkov, with FE-1 assisting, performed his first session of the Russian biomedical "Pilot-M"/NEURO experiment which he set up yesterday. The Pilot-M & Neurolab-2000M gear was left in place, to be used tomorrow by Oleg Kononenko. *[MBI-15 requires a table, ankle restraint system, electrodes, and two hand controllers (RUO & RUD) for testing piloting skill in "flying" simulations on a laptop (RSK1) under stopwatch control, as well as for studying special features of the psychophysiologic response of cosmonauts to the effects of stress factors in flight.]*

Kononenko conducted the periodic/long-term inspection of the SM RO (Service Module Working Compartment)'s pressure hull and ring, looking for any moisture, deposits, mold, corrosion and pitting behind panels 130, 134, 135, 138, 139, 454,

also underneath the TVIS treadmill (where deposit was discovered earlier) and the cold plates (where SNT and STR lines are installed). Last time done: 6/3. *[The inspection of the hull surface, which is coated with a primer and dark-green enamel, is done using cleaning napkins to wipe the area in question if required and reporting results to the ground. The hull inspection looks for changed color and cavities; if cavities are found, they are to be measured for depth (with chewing gum) after cleaning. Digital photographs of the shell before and after the removal of deposits were to be made for documentation.]*

After setting up the LULIN-ISS radiation complex yesterday for a 24-hr exposure period, Oleg today took readings from each of the four PILLE dosimeters and downlinked them successively, afterwards deactivating the equipment and closing out the activity.

Later, Kononenko also completed another radiation data monitoring & logging session for flux & dose rate data with the Matryoshka-R radiation payload (RBO-3-2) and its LULIN-5 electronics box. *[Accumulated readings were recorded on a log sheet for subsequent downlink to TsUP/Moscow via the BSR-TM payload data channel.]*

The COL "Cycle 11" software transition continues to go well. After performing stages 2 & 3 of the MMU (Mass Memory Unit) software load for the COL PWS-2 (Portable Work Station 2) laptop yesterday, Chamitoff today supported COL flight controllers in transitioning to Cycle 11 software by connecting & activating PWS-2 and assisting the ground with a TM & TC (telemetry & telecommanding) check. *[After the transition, COL will gradually be powered back on, including external payloads.]*

Working on the Russian RSS-2 laptop, Sergey Volkov ran digital photo flash cards from stowage through a virus check with the Norton AntiVirus application.

Gregory conducted another one of the periodic offloadings of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1054) with the collected water slated for processing. No samples were required.

The FE-2 also completed the weekly 10-min. CWC inventory as part of on-going WRM (Water Recovery & Management) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week. The current card (17-0002U) lists 34 CWCs (Contingency Water Containers, ~1314.1 L total) for the four types of water identified on board: technical water (535.2 L, for Elektron, flushing & hygiene, incl. 487.2 L flushing-only water because of* Wautersia *bacteria), potable water (706.7 L, incl. 174.6 L currently for flushing*

only), condensate water (64.3 L), waste/EMU dump and other (7.9 L). Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

In the US Airlock (A/L), Chamitoff performed the yearly inspection of the SCU (Service & Cooling Umbilical) O_2 poppets on two EMUs (Extravehicular Mobility Units, #3018 & #3004) to verify they are secure. Afterwards, Greg dumped and filled the EMU feedwater tanks, a regular maintenance requirement for on-orbit stowage.

Greg's A/L activities included a checkout of an HHM (Hand-Held Microphone) connected to the ATU-6 (Audio Terminal Unit 6), with the Space-to-Space Radio and an EMU radio powered on. Good voice results were obtained.

CDR Volkov performed monthly maintenance on the deactivated Russian IK0501 GA (Gas Analyzer) of the SOGS Pressure Control & Atmospheric Monitoring System by replacing its CO_2 filter assembly (BF) with a new unit from FGB stowage (done last: 7/2), then reactivating the unit. The old filter was discarded.

Later, Sergey performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Volkov also took care of the routine daily servicing of the SM's SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Kononenko meanwhile conducted the periodic checkout/verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the passageways SM PrK (Service Module Transfer Compartment)–ATV, PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1.

The crew performed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Sergey transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate

Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week). *[The wireless POLAR S810 HRMs resemble sports wrist watches, with some of their features. They display the heart rate as BPM (beats per minute) and % of HRmax, average HR plus exercise duration, along with 7 different exercise profiles. The HR is transmitted from an elastic belt around the chest to the wrist receiver for subsequent downloading to the MEC and analysis by special software. Receiver settings are also uploaded from the laptop.]*

Yesterday's scheduled OCA (Orbital Communications Adapter) checkout for the BCC HOSC (Backup Control Center/Huntsville Operations Support Center) setup, supported by Gregory, had to be deferred due to network configuration issues. The test, which is intended to verify OCA capabilities at the new BCC/Huntsville, was rescheduled for today for 2:15pm.

At ~3:25pm, Dr. Chamitoff also had his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop),

BCC Dry Run: Early this morning, starting at 1:00am EDT and running for seven hours, MCC-Houston and its Moscow support group (HSG) conducted another BCC (Backup Control Center) dry run in test mode, with no involvement of the ISS crew or vehicle, with TsUP playing back ACT (American Contingency Telemetry) from the last BCC Checkout as test. *[Purpose of this periodic exercise is to demonstrate BCC functionality under Russian assets while providing proficiency training for HSG personnel at the HSR (Houston Support Room) and TsUP-Moscow specialists. The ISS EMCC (Emergency Mission Control Center), located in Russia, comprises TsUP/Moscow as the Lead Control Center, coupled with HSR at TsUP. The BCC facility provides a command and control capability from TsUP if the EMCC must be activated. This is the case in situations that render MCC-Houston unable to provide telemetry, voice, and command capability for extended periods. EMCC is also used when the threat of severe weather results in evacuation of the MCC-H building for extended periods. In such an emergency, both Russian servers (CMD/command & TM/telemetry) are transitioned from MCC-H connectivity to BCC configuration, after which only the BCC can connect to the CMD and TM ports.]*

CEO (Crew Earth Observations) photo targets uplinked for today were **Teide Volcano, Canary Islands** *(looking right of track for detailed images of the flanks and inner walls of the large and active Teide Volcano. This volcano makes up most of the island of Tenerife. Tenerife was perhaps observed in eruption by Christopher Columbus),* **Santorini Volcanic Complex, Greece** *(looking close to nadir for this circular set of islands. The Santorini volcanic eruption of 3,600 years ago may have*

led indirectly to the collapse of the Minoan civilization on the island of Crete, 110 km to the south, by releasing a gigantic tsunami. The eruption may be the source of the legend of Atlantis), and **Johnston Island reef, central Pacific** *(this six-mile-long reef lied right of track. An airstrip occupies the small 2-mile-long island. Detailed images of the coral reef were requested)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 17/18 Main Activities:

- Fri. (8/15): MBI-15/Neuro ops, MBI-21/Pneumocard, JEMRMS checkout, CDMK check, VOA power down, 29P stow, KOB-1 maintenance.
- Sat. (8/16): SAMS Ghosting, Weekly house cleaning.
- Mon. (8/18): MO-7/MO-8 (all), BMP ch. 2 regen, MO-1, ATV transfers, SHERE session, RED + Accessories inspect, EMU Battery 2071 discharge (BSA Ops),
- Tue. (8/19): AED inspect, Initiate 85 Day Maint for EMU Battery 2071, VHF Emergency Comm Checkout, Rack Hardware Installation Prep, MO-9, NOA1, CSA-CP maintenance, SSVP BZV docking & internal transfer system/ screw clamps ops.
- Wed. (8/20): ANITA deactivation and stow, Ku-Band Forward Receiver Relocation & Checkout, Ground Strap/Pivot Fitting install in JPM, MO-10 (all), PFE-OUM setup & prep.

ISS Orbit (as of this morning, 8:16am EDT [= epoch]):
Mean altitude -- 356.1 km
Apogee height -- 361.5 km
Perigee height -- 350.7 km
Period -- 91.66 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0008059
Solar Beta Angle -- -32.9 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.71
Mean altitude loss in the last 24 hours -- 172 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55758

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/02/08 -- Progress M-64/29P undocking, from FGB nadir
09/07/08 -- ATV1 undocking, from SM aft port (loiter until 9/29 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch

09/12/08 -- Progress M-65/30P docking (SM aft)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) or 10/24?
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/13/08
Date:	Wednesday, August 13, 2008 2:57:56 PM
Attachments:	

ISS On-Orbit Status 08/13/08

All ISS systems continue to function nominally, except those noted previously or below.

FE-2 Chamitoff started his day with the week-long experiment SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight), using the payload software for data logging and filling in questionnaire entries in the experiment's session file on the HRF-1 laptop. *[To monitor the crewmember's sleep/wake patterns and light exposure, Greg wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Upon wake-up, FE-1 Kononenko terminated his eighth MBI-12 SONOKARD experiment session for the long-term Russian sleep study, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. Sergey Volkov's new MBI-12 session starts tonight (~5:20pm). *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

Using the Russian PLASMA-ISS (KORONA) experiment, prepared yesterday, Oleg Kononenko had ~30 min to conduct measurement operations, recording images and spectra from the Soyuz TMA-12 surfaces during the ATV reboost firing. Later, the video cassette and memory flash card with spectrometer data were removed, camcorder & laptop turned off and the hardware dismantled for stowage. *[Using Russian Laptop 3 and the "Relaksatsiya" (Relaxation) spectrometer & video camera*

at SM (Service Module) window 9, the experiment registered luminosity values of the spacecraft surface from the plasma created by the thruster jets.]

After yesterday's successful replacement of all 36 treadmill RBAs (Roller Bearing Assemblies), CDR Volkov & Gregory Chamitoff today worked through the final steps of maintenance activities on the TVIS (Treadmill with Vibration Isolation & Stabilization) by completing activation and checkout of the treadmill along with a video filming of the a noise capture & speed characterization test to verify TVIS operation and ensure that the belt repair activity has resolved the contact noises. Afterwards, the crew was given the Go for TVIS operations by the ground.

Later, Chamitoff completed the regular monthly & quarterly TVIS maintenance, inspecting the condition of harnesses, belt slats, corner bracket ropes, IRBAs (Isolation Restorative Bungee Assemblies) and gyroscope wire ropes for any damage or defects, lubricating as required plus recording time & date values.

Continuing his preparations of payload operations in the JAXA JPM (JEM Pressurized Module), Gregory also completed the remaining two (of three) setups of the FPEF (Fluid Physics Experiment Facility) for the planned MS (Marangoni Surface) convection experiment by assembling FPEF MS core and cassette, checking them for leaks and completing FPEF MS assembly. *[In microgravity, fluids react differently to stresses when compared to the same stresses on Earth. Understanding the responses to the stressors allows for improved fluid flow models to be designed. Mass transfer on or in a liquid due to surface tension differences is called the Marangoni Effect (which, for example, stabilizes a soap film). The Marangoni convection experiment in the FPEF examines fluid tension flow in micro-G: first, a liquid bridge of silicone oil is formed into a pair of disks. Then, using temperature differences imposed on the disks, convection is induced causing the silicone oil to move and transition through different types of flows because of its fluid instability: successively from laminar to oscillatory, chaos, and turbulence flows as the driving force increases. The flow and temperature fields are observed in each stage and the transition conditions and processes are investigated.]*

In preparation for the upcoming Kibo JEMRMS (Robotic Manipulator System) checkout later this week, Greg disconnected the RLT (Robotics Laptop) from its RIP (Remote Interface Panel) and hooked it up the JEMRMS UOP (Utility Outlet Panel) after verifying that the MDP (Management Data Processor) was powered off.

In the COL (Columbus Orbital Laboratory, Gregory unlocked the FSL FCE (Fluid Science Laboratory/Facility Core Element) which he had secured on 8/8 with four locking bolts against the acceleration forces caused by this morning's ISS reboost.

In the SM, Oleg unstowed the LULIN-ISS radiation complex kit and set up its ICU

(Interface Control Unit, Russian: BUI) with four PILLE radiation dosimeters, connecting it to a power outlet (PPS-26) and RSE-Med laptop. The dosimeters were then activated for a duration of 24 hours. *[Done before on 6/20.]*

Kononenko also serviced the running Matryoshka-R (RBO-3-2) radiation payload which has taken over the ESA/RSC-Energia experiment ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS/ALC) with its Spectrometer (AST) and ALC equipment on DC1 panel 429. *[Oleg retrieved the ALC-949 PCMCIA (Portable Computer Memory Card International Adapter) from stowage, installed it for a checkout run of several minutes in the AST, then checked the card in the RSK-1 laptop, before re-inserting the #949 card into the AST PCMCIA slot for operation.]*

A major activity for the FE-2 today was to support the COL Cycle 11 software transition on the POCs (Portable Onboard Computers). *[Today's activity focused on PWS (Portable Workstation) A31p software partition transfers (4) to the MMU (Memory Mass Unit), disconnecting PWS-2 from the LAN (Local Area Network) and completing the reload on PWS-2 with the software upgrade from CD (compact disk). More to come tomorrow.]*

Chamitoff retrieved and stowed the four passive FMK (Formaldehyde Monitoring Kit) sampling assemblies deployed by him on 8/11 in the Lab (at P3, below CEVIS) and SM (at the most forward handrail, on panel 307), to catch any atmospheric formaldehyde on a collector substrate for subsequent analysis on the ground. *[Two monitors each are usually attached side by side, preferably in an orientation with their faces perpendicular to the direction of air flow.]*

CDR Volkov unstowed and configured the Russian biomedical "PILOT-M"/NEURO experiment (MBI-15), which requires a table, operator ankle restraint system, electrodes, and two hand controllers (RUO & RUD) for testing piloting skill in "flying" simulations on the RSK1 laptop under stopwatch control, and Neurolab-2000M sensors. Operation of the experiment by Sergey is scheduled tomorrow, by Oleg on Friday.

The CDR also conducted ground tagup-supported checkout tests of the VShTV Wide-Angle Vertical Sighting Device on the television screen showing Earth terrain. Screen shots were then downlinked to the ground via OCA. *[Purpose of the routine VShTV tests was to verify proper operation and optical quality of the device after being exposed to spaceflight conditions over a long period.]*

The FE-1 performed another session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program, today "hard" scheduled, using the D2X digital camera with

the F800 telephoto lens, then immediately downlinking photographs via the BSR-TM channel. *[Uplinked target area was the upper section of the Inguri river valley in the Greater Caucasus Mountain Range from the mountain ridge to a hydropower plant to the south of Mt. Elbrus.]*

Oleg also supported the BIO-5 Rasteniya-2 ("Plants-2") experiment, which researches growth and development of plants (peas) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}), by checking up on status, monitoring the greenhouse, taking pictures and downloading them to the ground,

The CDR had another 1h 35m reserved for more trash/equipment transfers to Progress 29P and loading it aboard, keeping the IMS (Inventory Management System) updated with the disposal transfers.

Later, Sergey performed the daily IMS maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/ import to its three databases on the ground (Houston, Moscow, Baikonur).

Meanwhile, the FE-1 took care of the routine daily servicing of the SM’s SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Oleg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~10:25am EDT, Dr. Chamitoff supported live interactive PAO interviews of ~10 minutes each with two clients,- KRIV-TV, Houston, TX and The Pearland Journal, Pearland, TX.

At ~12:05pm, Gregory powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, and power supply) and at 12:10pm conducted a ham radio exchange with young campers at the Summer Playground Camp of the town of Berkeley Heights, NJ. *[Berkley Heights sponsors an annual summer playground camp at one of the town’s parks. Each year the*

New Providence Amateur Radio Club sets up its station, N2 XJ, at the camp as an educational opportunity for the children attending the camp. The camp is open to all grades of school students, but most campers are in grades from kindergarten to sixth grade. Questions to the crew were uplinked beforehand. "Do you have any plants growing on the Space Station, and can you bring them back to Earth to study them?"; "Have you ever worked with a female astronaut?"; "What can a girl do to become an astronaut?"; "Have you done a spacewalk, and what is it like?"; "I've heard that Jeff Williams liked spicy foods in space. Do you have the same experience?"; Can you see an eclipse from the Space Station despite the station's high speed?"; "Can you see aurora from the Space Station?"; "How do you eat and drink while floating?"; "Can you see meteors from the Space Station, and do they look the same as here on Earth?"; "Do you think that children will go into space someday?"; "Will you be home in time to vote, and what state do you vote in?"]

At ~3:10pm, the FE-2 supported a real-time audio/video & software checkout of the new BCC (Backup Control Center) setup at the HOSC (Huntsville Operations Support Center). Gregory is required only to check out the NetMeeting SSC (Station Support Computer) portion, including a short video exchange with the ground.

ATV Reboost Update: The ISS reboost with two ATV1 "Jules Verne" OCS (main propulsion) thrusters was successful. The maneuver started this morning at 3:58am EDT for 16 min 35 s and completed nominally. Actual Delta-V was 3.3 m/s vs. 3.3 m/s (10.8 ft/s) planned, resulting in a mean altitude increase of 5.8 km (3.1 nmi), as planned. The reboost consumed 325.4 kg of propellant for the maneuver and 195 kg of propellant for attitude control. Purpose of the maneuver was altitude maintenance and to set up phasing for upcoming visiting vehicles. *"Bon spectacle, Monsieur Verne!"*

CEO (Crew Earth Observations) photo targets uplinked for today were **Santorini Volcanic Complex, Mediterranean** *(Santorini [aka Thera], with its steep-walled caldera rim, is easy to detect from low earth orbit as a circular island group—looking left of track after crossing the large Mediterranean island of Crete. Santorini is composed of overlapping shield volcanoes cut by at least four partially overlapping collapse calderas. The youngest caldera formed about 3600 years BP during the Late-Bronze-Age that forced abandonment of the thriving island. Subsequent eruptions occurred in 197 BC, 1650 AD [submarine eruption] and 1950),* **Tropical depression Hernan, E. Pacific** *(Dynamic event. This well structured storm may still have been photogenic when ISS passed by to the east),* **Mauna Loa, Hawaii** *(detailed images left of track of volcanic features on the crest and flanks of the largest volcano on Earth are requested. Mauna Loa comprises most of the island of Hawaii, and rises 56,000 feet from its base on the sea floor, with 13,680 feet visible above sea level. Mauna Loa is among Earth's most active volcanoes, having*

erupted 33 times since its first well-documented historical eruption in 1843. Its most recent eruption was in 1984), and **Andrews Forest, Oregon** *(nadir pass. Detailed, overlapping images at nadir acquired this target. Documentation of seasonal vegetation change is the rationale for this LTER [Long Term Ecological Research] site on the slopes of the Cascade Range in Oregon)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Remaining Week 17 Main Activities:

- Thurs. (8/14): MBI-15/Neuro ops, JAXA JEMRMS checkout review, 29P stow, COL Cycle 11 software transition.
- Fri. (8/15): MBI-15/Neuro ops, MBI-21/Pneumocard, JEMRMS checkout, CDMK check, VOA power down, 29P stow, KOB-1 maintenance.
- Sat. (8/16): SAMS Ghosting, Weekly house cleaning.

ISS Orbit (as of this noon, 12:12pm EDT [= epoch]):
Mean altitude -- 356.3 km
Apogee height -- 362.3 km
Perigee height -- 350.2 km
Period -- 91.67 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0008987
Solar Beta Angle -- -30.2 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.71
Mean altitude gain in the last 24 hours -- 5800 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55758

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
09/02/08 -- Progress M-64/29P undocking, from FGB nadir
09/07/08 -- ATV1 undocking, from SM aft port (loiter until 9/29 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) or 10/24?
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking

11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/12/08
Date:	Tuesday, August 12, 2008 1:10:00 PM
Attachments:	

ISS On-Orbit Status 08/12/08

All ISS systems continue to function nominally, except those noted previously or below.

FE-2 Chamitoff started his day with the week-long SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment, using the payload software for data logging and filling in questionnaire entries in the experiment's session file on the HRF-1 laptop. *[To monitor the crewmember's sleep/wake patterns and light exposure, Greg wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

FE-1 Kononenko serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out"-to-vacuum cycle on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~4:15pm EDT. Filter bed #1 was regenerated yesterday. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time done: 7/28 & 7/30).]*

CDR Volkov & Gregory Chamitoff performed Day 2 maintenance activities on the TVIS (Treadmill with Vibration Isolation & Stabilization), removing and replacing the remaining RBAs (Roller Bearing Assemblies), 36 total, and checking out the treadmill. *[Yesterday's task of manufacturing and installing a tread belt patch was successfully accomplished, after some initial problems in getting the correct running torque settings after re-installing the belt slats. Today, the CDR & FE-2 finished the RBA R&R and returned the belt and chassis to the original configuration. Afterwards, the two crewmembers were to run a Noise Capture & Speed Characterization Test similar to the activity performed on 7/29 during TVIS*

troubleshooting. This data will be used to compare to the first video once the maintenance is complete.]

Kononenko completed the periodic collection of air samples in the SM (Service Module) & FGB using the AK-1M sampler kit, recording date, time & location. A second sample for Freon-210 was taken in the SM with the AK-1M-F. Kits and pouches were then restowed.

Afterwards, the FE-1 also conducted the periodic atmospheric sampling in the center of the Lab, SM and JPM (JEM Pressurized Module) with the U.S. GSC (Grab Sample Container). *[GSC #1041 was not to be used.]*

Working briefly on the Matryoshka-R (RBO-3-2) radiation payload, which includes the ESA/RSC-Energia experiment ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS/ALC) with its Spectrometer (AST) and ALC equipment, Kononenko turned off the AST, checked out its PCMCIA (Portable Computer Memory Card International Adapter) card ALC-953 on the RSK-1 laptop and then downlinked the zipped data file via OCA. The AST was not reactivated.

Later, Oleg had another 1h 45m reserved for more trash/equipment transfers to Progress 29P and loading it aboard, keeping the IMS (Inventory Management System) updated with the disposal transfers.

In preparation for tomorrow morning's ISS reboost with the ATV (Automated Transfer Vehicle) "Jules Verne", the FE-2 supported SAMS (Space Acceleration Measurement System) ground commanding by activating its ICU (Interim Control Unit) in Rack LAP2/Drawer 1. *[The reboost is scheduled tomorrow at 3:58am EDT, for 16min 35 sec. SAMS acquires acceleration data relevant to characterization of the dynamic vibratory environment on the ISS.]*

Also for the reboost maneuver, Kononenko unstowed the PLASMA-ISS hardware and installed it at SM window #9 and aligned its sight for the KORONA experiment, which will record the luminosity of the surface of the Soyuz TMA-12 during the ATV reboost thruster (KD) firing. Oleg will be operating the equipment during the firing. *[Plasma-ISS uses a UV (ultraviolet) camera, spectrometer (SP), camcorder (VS) with a video cassette, and accessories, mounted on a bracket adapter.]*

To protect the science windows of the JAXA JPM and U.S. Lab from the thruster blast, Greg Chamitoff closed their external shutters.

Kononenko performed the routine daily servicing of the SM's SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities,*

replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]

The FE-1 also completed the daily IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/ import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-1, FE-2) and RED resistive exercise device (CDR, FE-1, FE-2). Later, Oleg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

The crew is having their regular periodic PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Oleg at ~10:00am, Sergey at ~1:25pm, Greg at ~4:05pm EDT.

At ~4:45pm, Chamitoff is also scheduled for his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop),

At ~5:20pm EDT, just before sleep time, the FE-1 will again set up the Russian MBI-12 SONOKARD (Sonocard) payload and start his eighth experiment session, using a sports shirt from the SONOKARD kit with a special device in the pocket for testing a new method for acquiring physiological data without using direct contact on the skin. Measurements are recorded on a data card for return to Earth.
[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]

A new discretionary task added on the U.S. "job jar" list for Greg Chamitoff for today is to work on the Columbus Biolab Incubator (BLB INC), removing WAICO-1 (Waving & Coiling of Arabidopsis Roots at Different g-levels) experiment containers (ECs) from Rotor B and to install & remove Reference ECs.

VolSci Program Preview: For the weekend of 8/16, Gregory was offered three choices for the Voluntary Weekend Science program: (1) SHERE (Shear History

Extensional Rheology Experiment) science runs in the CGBA; (2) an "operations improvement" session with SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellites) with all three satellites; and (3) a Space Careers Demo EPO (Education Payload Operations), creating an educational video discussing different careers found at NASA, to be used to produce an educational product to enhance existing education resources for students in grades 9-12.

SPDM Checkout Update: Ground-commanded checkout activities of the Special Purpose Dexterous Manipulator (SPDM) continued today, including a Brake Run-In Test. *[Yesterday, controllers checked the FMS (Force Moment Sensors) on both OTCMs (On-orbit Tool Change-out Mechanisms), as well as the OTCM gripper and socket advance mechanism using manual hard stop commands, a check of the gripper, socket advance and torquer mechanisms using the BDU (Back-up Drive Unit) in low and high voltage modes and a check of the brakes on all the joints on both arms.]*

ATV1 Reboost: Tomorrow's ISS reboost by two of the four ATV main engines is scheduled for a TIG (Time of Ignition) of 3:58am EDT. Burn duration: 16 m 35 s, to yield a delta-V of 3.3 m/s (10.8 ft/s). The expected altitude gain (delta-H) is 5.8 km (3.1 nm). Purpose of the reboost is for altitude maintenance and to set up phasing for upcoming visiting vehicles.

KURS Test: TsUP/Moscow has scheduled a test today of both strings of the KURS automated rendezvous radio command system for the FGB port, in preparation for the Progress M-64/29P undocking on 9/2.

CEO (Crew Earth Observations) photo targets uplinked for today were **Mt. Etna, Sicily** *(looking left for Etna volcano which is almost always smoking),* and **Yellowstone National Park, Wyoming** *(Greg was to shoot overlapping nadir views of the park where trails are being mapped).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Remaining Week 17 Main Activities:

- Wed. (8/13): ATV reboost, FMK stow, TVIS quarterly maintenance, Columbus Cycle 11 software transition, Plasma-ISS experiment, JAXA FPEF setup, 29P stow.
- Thurs. (8/14): MBI-15/Neuro setup, JAXA JEMRMS checkout review, 29P stow.
- Fri. (8/15): MBI-15/Neuro, MBI-21/Pneumocard, JEMRMS checkout,

CDMK check, VOA power down, 29P stow, KOB-1 maintenance.

- Sat. (8/16): SAMS Ghosting, Weekly house cleaning.

ISS Orbit (as of this morning, 8:57am EDT [= epoch]):
Mean altitude -- 350.4 km
Apogee height -- 357.4 km
Perigee height -- 343.3 km
Period -- 91.55 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0010433
Solar Beta Angle -- -27.0 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.73
Mean altitude loss in the last 24 hours -- 85 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55740

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
08/13/08 -- ATV Reboost (~3:58am EDT, 3.3 m/s delta-V)
09/02/08 -- Progress M-64/29P undocking, from FGB nadir
09/07/08 -- ATV1 undocking, from SM aft port (loiter until 9/29 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) or 10/24?
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)

04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/11/08
Date:	Monday, August 11, 2008 12:42:28 PM
Attachments:	

ISS On-Orbit Status 08/11/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 17 of Increment 17.*

FE-2 Chamitoff started out with his second week-long session of the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment, using payload software for data downloading and filling in questionnaire entries in the experiment's session file on the HRF-1 laptop. *[To monitor the crewmember's sleep/wake patterns and light exposure, Greg wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

FE-1 Kononenko performed the periodic service of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The process will be terminated at ~5:15pm EDT and Bed #2 regeneration completed tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time: 8/5&6)];*

Volkov & Chamitoff had several hours set aside for working through a major two-day IFM (Inflight Maintenance) on the TVIS treadmill, first to repair the torn tread belt with an improvised patch & shim and later to undertake the periodic R&R (removal & replacement) of the TVIS roller bearings. *[During their TVIS chassis inspection on 8/1, the crew discovered a one-inch tear in the tread belt on the port edge. This necessitated repair since a torn belt could raise a belt slat resulting in a tread belt jam and subsequent motor box failure. A procedure was developed on the ground for a patch to be created and installed on both sides of the belt and for a hole to be punched at the end of the tear. Shims were then to be added to the rear*

and forward deck so that the likelihood of the belt slats, with patch installed, scraping the deck is minimized.]

The FE-2 also completed the periodic deployment of four passive FMK (Formaldehyde Monitoring Kit) sampling assemblies in the Lab (at P3, below CEVIS) and SM (at the most forward handrail, on panel 307) for two days, to catch any atmospheric formaldehyde on a collector substrate for subsequent analysis on the ground. *[Two monitors each are usually attached side by side, preferably in an orientation with their faces perpendicular to the direction of air flow.]*

FE-1 Kononenko set up the hardware for the Russian MBI-21 PNEVMOKARD experiment and conducted the session, his third, which forbids moving or talking during data recording. The experiment is controlled from the RSE-Med A31p laptop, equipped with new software, and uses the TENZOPLUS sphygmomanometer to measure arterial blood pressure. *[PNEVMOKARD (Pneumocard) attempts to obtain new scientific information to refine the understanding about the mechanisms used by the cardiorespiratory system and the whole body organism to spaceflight conditions. By recording (on PCMCIA cards) the crewmember's electrocardiogram, impedance cardiogram, low-frequency phonocardiogram (seismocardiogram), pneumotachogram (using nose temperature sensors), and finger photoplethismogram, the experiment supports integrated studies of (1) the cardiovascular system and its adaptation mechanisms in various phases of a long-duration mission, (2) the synchronization of heart activity and breathing factors, as well as the cardiorespiratory system control processes based on the variability rate of physiological parameters, and (3) the interconnection between the cardiorespiratory system during a long-duration mission and the tolerance of orthostatic & physical activities at the beginning of readaptation for predicting possible reactions of the crewmembers organism during the their return to ground.]*

In preparation for the first Japanese payload activity, a JAXA Educational Payload Operation (EPO) session, Gregory unstowed and set up the Microgravity Clay Experiment (MCE) in the Kibo JPM (JEM Pressurized Module), attaching the MCE box on the CBEF (Cell Biology Experiment Facility) micro-G door and forming clay in a human shape, while videotaping the activity.

Also in the JPM, Greg Chamitoff completed the first (of three) setups of the FPEF (Fluid Physics Experiment Facility) for the planned Marangoni Surface experiment by readying the MWA (Maintenance Work Area) for operation.

Meanwhile, Oleg performed routine preventive maintenance in the Soyuz TMA-12/16S by cleaning the screen of the BVN fan/heater assembly in the spacecraft's Orbital Module (BO) at the DC1 nadir port.

Later, Kononenko took the periodic readings of potentially harmful atmospheric contaminants in the SM (Service Module), using the CMS (Countermeasure System), a component of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, which uses preprogrammed microchips to measure H_2CO (Formaldehyde, methanal), CO (Carbon Monoxide) and NH_3 (Ammonia), taking one measurement per microchip.

The FE-1 also had 2h 15m set aside for more trash/equipment transfers to Progress 29P and loading it aboard, guided by an uplinked cargo transfer list and stowage map to ensure proper center-of-gravity positioning for post-undocking control.

The FE-2 had 1h 20m reserved for transferring and unpacking cargo delivered on the ATV-1 (Automated Transfer Vehicle).

Kononenko performed the routine daily servicing of the SM's SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Oleg also completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Kononenko transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~2:20pm EDT, the crew will convene for their standard bi-weekly teleconference with the JSC Astronaut Office (Steve Lindsey), via S-band S/G-2 audio & phone patch.

Working from the Russian discretionary "time permitting" task list, the FE-1 conducted the regular status check on the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under

spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

JAXA CGSE Update: On 8/8, when the CBEF internal solenoid valves supplying CO_2 (carbon dioxide) to the incubator were opened & closed, an anomalous pressure drop was observed which may indicate a potential CO_2 leak of the CGSE (Common Gas Support Equipment). Investigation is underway on the ground. In case of an actual leak, the volume of gas in the bottles is very small and would not bring the atmosphere to the toxic limit; also, with the cabin ventilation running, any hazard from this leak is controlled. There is no impact on payload operations until end of Inc-17 since no experiment requiring CO_2 is planned in this Increment.

[CBEF is a CO_2 gas incubator with controlled temperature and humidity, to be used for various life science experiments such as cultivating cells, plants, and so on in the JPM. It consists of an incubator and control equipment for CBEF control & communication.]

SPDM Checkout Update: Postponed from last week (8/5-6), the ground-commanded checkout of the Special Purpose Dexterous Manipulator "Dextre" today and tomorrow focuses on OTCM (ORU Tool Mechanism) socket in manual & automatic mode. *[Checkout steps are in summary: (1) Pre-motion survey using ISS and SPDM cameras to verify SPDM arm & body workspace prior to ground control operations, (2) ground-controlled positioning of OTCM1 & OTCM2 in view of the SPDM CLPA2 (Camera, Light & Pan/Tilt Assembly 2) to allow controllers to observe OTCM mechanism motion, (3) calibration of the OTCM mechanisms in preparation for checkout, and (4) performing OTCM mechanism checkout in automatic mode.]*

O_2 Repress Update: The repress last Friday (8/8) added 7 mmHg partial pressure of oxygen from Progress M-64/29P to the cabin atmosphere.

TsVM Update: Lane 3 of the Russian Central Computer in the SM failed over the weekend. The other two lanes are up and nominal. Teams are analyzing.

COL Update: The data of the first GEOFLOW experiment run in the Columbus laboratory are on the ground. Engineers are still working to resolve an issue with the insertion of a tape in the FSL (Fluid Science Laboratory).

Kibo Commissioning Update: Successfully completed by Gregory Chamitoff were MMA (Microgravity Measurement Apparatus) checkout, RYUTAI and SAIBO rack installation & check out, and JEMRMS (Robotic Manipulator System) Backup Drive checkout. JEMRMS main arm checkout is planned later this week.

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Remaining Week 17 Main Activities:

- Tues. (8/12): TVIS roller bearing R&R, TVIS speed characterization, SPDM "Dextre" ops, BMP regen, 29P stow.
- Wed. (8/13): FMK stow, TVIS quarterly maintenance, ATV reboost, Columbus Cycle 11 software transition, Plasma-ISS experiment, JAXA FPEF setup, 29P stow.
- Thurs. (8/14): MBI-15/Neuro setup, JAXA JEMRMS checkout review, 29P stow.
- Fri. (8/15): MBI-15/Neuro, MBI-21/Pneumocard, JEMRMS checkout, 29P stow, KOB-1 maintenance.

ISS Orbit *(as of this morning, 6:39am EDT [= epoch]):*
Mean altitude -- 350.5 km
Apogee height -- 357.5 km
Perigee height -- 343.4 km
Period -- 91.55 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0010419
Solar Beta Angle -- -23.6 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.73
Mean altitude loss in the last 24 hours -- 76 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55722

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
08/13/08 -- ATV Reboost (~3:30am EDT, 3.45 m/s delta-V)
09/02/08 -- Progress M-64/29P undocking, from FGB nadir
09/07/08 -- ATV1 undocking, from SM aft port (loiter until 9/29 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) or 10/24?

11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)
03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/10/08
Date:	Sunday, August 10, 2008 2:13:17 PM
Attachments:	

ISS On-Orbit Status 08/10/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – rest day for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff. Ahead: Week 17 of Increment 17.*

FE-2 Chamitoff had three hours reserved for the regular weekly station cleaning in the USOS (US Segment) which wasn't scheduled yesterday alongside the RS (Russian Segment) "uborka" housecleaning by his two crewmates.

For CDR Volkov, it was time again for the recharging of the Motorola Iridium-9505A satellite phone brought up on Soyuz 16S, a monthly routine job and his fourth time. *[After retrieving it from its location in the TMA-12/16S descent module (BO), Sergey initiated the recharging of its lithium-ion battery, monitoring the process every 10-15 minutes as it took place. Upon completion at ~12:55pm, the phone was returned inside its SSSP Iridium kit and stowed back in the BO's operational data files (ODF) container. The satphone accompanies returning ISS crews on Soyuz reentry & landing for contingency communications with SAR (Search-and-Rescue) personnel after touchdown (e.g., after an "undershoot" ballistic reentry, as happened during the recent 15S return). The Russian-developed procedure for the monthly recharging has been approved jointly by safety officials. During the procedure, the phone is left in its fire-protective fluoroplastic bag with open flap. The Iridium 9505A satphone uses the Iridium constellation of low-Earth orbit satellites to relay the landed Soyuz capsule's GPS (Global Positioning System) coordinates to helicopter-borne recovery crews. The older Iridium-9505 phones were first put onboard Soyuz in August 2003. The newer 9505A phone, currently in use, delivers 30 hours of standby time and three hours of talk, up from 20 and two hours, respectively, on the older units.]*

FE-1 Kononenko completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including the weekly collection of the toilet flush (SP) counter and water supply

(SVO) readings for calldown to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The FE-1 also checked up on the Russian POTOK-150MK (150 micron) decontamination filter unit of the SM's SOGS air revitalization subsystem, gathering weekly data on Total Operating Time & "On" durations for reporting to TsUP-Moscow.

As generally every day now, starting at ~9:00am and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control ppCO_2 levels. In this configuration for the daily ops, connecting & disconnecting the ITCS cooling loop is not required. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking.]*

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

A voluntary task for Gregory and Sergey for today was to print out and review uplinked procedures for tomorrow's and Tuesday's TVIS treadmill repair.

Working off his suggested "time permitting" task list, Volkov conducted another session for Russia's Environmental Safety Agency (EKON), making observations and taking KPT-3 aerial photography with the NIKON D2X camera of environmental conditions near the Baikonur launch site and Lake Balkash.

Also working from the Russian discretionary task list, Oleg Kononenko conducted another session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program, using the D2X digital camera with the F800 telephoto lens and the HVR-Z1J SONY video camera. *[Uplinked target areas were oil contamination of the Caspian sea surface and drilling platforms near the Dagestan shore, the coastal strip of the Aral Sea in overlapping shots, the Ob and Bia river valleys, forest conditions (logging & burnt out areas) near populated areas in the Altai and Sayan mountains in nadir, the Irkut river valley from the northern point of Lake Hubsugul to the south point of Lake Baikal, the confluence of the Desna tributaries with the Desna river falling into the Dnepr river near Kiev, gulley and ravine landscapes of Central Russia up to Volga river, the steppe on the left shore of the Volga river to the south of Saratov (Y. A. Gagarin's landing site) in nadir, and former Soviet Army firing ranges in Germany and coal pits after reclamation.]*

A third activity suggested on the “time permitting” job roster for Oleg was another run of the Russian DZZ-2 "Diatomeya" ocean observations program, using the NIKON-F5 DCS still camera and the HDV (high-definition) video camcorder from SM window 8 for ~20 min to record high production water areas for obtaining data on color field composition in dynamic regions of the ocean and in near-estuary areas of large rivers, plus the current cloud cover above these waters, its rating, and special forms of cloud formation. *[Uplinked target zones in the Atlantic Ocean were the coastal areas of Brazil and Panama, the Strait of Gibraltar and the offshore area of Great Britain.]*

Also working from the discretionary task list, the FE-1 conducted the regular status check on the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this “Gateway” website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Week 17 Main Activities:

- Mon. (8/11): TVIS belt maintenance, TVIS roller bearing R&R, SPDM “Dextre” ops, FMK deploy, BMP regen, MBI-21/Pneumocard, 29P stow.
- Tues. (8/12): TVIS roller bearing R&R, TVIS speed characterization, SPDM “Dextre” ops, BMP regen, 29P stow.
- Wed. (8/13): FMK stow, TVIS quarterly maintenance, ATV reboost, Columbus Cycle 11 software transition, Plasma-ISS experiment, JAXA FPEF setup, 29P stow.
- Thurs. (8/14): MBI-15/Neuro s/u, JAXA JEMRMS ops review, 29P stow.
- Fri. (8/15): MBI-15/Neuro, MBI-21/Pneumocard, JEMRMS ops, 29P stow, KOB-1 maintenance.

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10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/09/08
Date:	Saturday, August 09, 2008 4:00:23 PM
Attachments:	

ISS On-Orbit Status 08/09/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – mostly off duty for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff.*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the SM (Service Module) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

As part of the house cleaning, the crew also conducted regular maintenance inspection & cleaning on fan grilles in the FGB (TsV2) and SM (VPkhO, VPrK) plus in the COL (Columbus Orbital Laboratory).

For today's VolSci (Voluntary Weekend Science) program, another session with SHERE (Shear History Extensional Rheology Experiment), FE-2 Chamitoff –

- Activated the MSG (Microgravity Science Glovebox),
- Powered on the SHERE hardware,
- Accessed the CGBA (Commercial Generic Bioprocessing Apparatus) to install the SHERE FM (Fluid Module) #8,
- Supported the first SHERE experiment run (Test Point 15),
- Transferred the module with the fluid sample,
- Installed FM #11 for the second experiment run (Test Point 25) ,
- Removed the FM from the CGBA, followed by SHERE data transfer,
- Turned off the SHERE/CGBA equipment,
- Transferred the data files to the MSG laptop, and
- Powered down the MSG.

[Background: Rheology is the study of the deformation and flow of matter under the influence of an applied stress which might be, for example, a shear stress or extensional stress. In practice, rheology is principally concerned with extending the "classical" disciplines of elasticity and (Newtonian) fluid mechanics to materials whose mechanical behavior cannot be described with the classical theories. SHERE is designed to study the effect of preshear on the transient evolution of the microstructure and viscoelastic tensile stresses for monodisperse dilute polymer solutions in the MSG. Collectively referred to as "Boger fluids," these polymer solutions have become a popular choice for rheological studies of non-Newtonian fluids and are the non-Newtonian fluid used in this experiment. The SHERE hardware consists of the Rheometer, Camera Arm, Interface Box, Cabling, Keyboard, Tool Box, Fluid Modules, and Stowage Tray.]

The FE-2 performed another standard calibration on the new CSA-O_2 (Compound Specific Analyzer-Oxygen) units #1043 & #1059, delivered on 1J.

Supporting ground-commanded commissioning preparations in the JAXA Kibo JPM (JEM Pressurized Module), Gregory turned off power output from the Saibo & Ryutai Rack UDCs (Utility DC-to-DC Converters) to the MMA NCU & RSUs (Microgravity Measurement Apparatus/Network Control Unit & Remote Sensor Units), then deactivated the NCU/RSUs themselves.

FE-1 Kononenko completed the routine daily servicing of the SM's SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The FE-2 took measurements for the regular atmospheric status check for ppCO_2 (Carbon Dioxide partial pressure) in the Lab, SM (at panel 449) and COL, using the hand-held CDMK (CO_2 Monitoring Kit, #1002). *[The battery pack was to be replaced with the one from unit #1009 if necessary. Purpose of the 5-min activity is to trend with MCA (Major Constituents Analyzer), i.e., to correlate the hand-held readings with MCA measurements. Greg's CDMK reading in the SM was 0.49; in Lab 0.46, and in COL 0.50.]*

Gregory also filled out the regular FFQ (Food Frequency Questionnaire), his ninth, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The*

FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Greg transferred the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~10:15am EDT, the crewmembers conducted their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP-Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

The two cosmonauts had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Oleg at ~6:30am, Sergey at ~8:10am.

Working off his suggested “time permitting” task list, Volkov conducted another session for Russia's Environmental Safety Agency (EKON), making observations and taking KPT-3 aerial photography with the NIKON D2X camera of environmental conditions near Tskhinvala and the Baikonur launch site.

Also working from the discretionary task list, Oleg Kononenko conducted another session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program, using the D2X digital camera with the F800 telephoto lens and the HVR-Z1J SONY video camera. *[Uplinked target areas were glaciers on the north slope of the main Caucasus Ridge, the Dombai region, after-effects of border conflict operations in the Caucasus, the Kalmyk steppe, the main stem stream of the Volga river (west-most) from Astrakhan to Caspian Sea, a series of overlapping shots of the Ob and Bia river valleys (Bia river head stream, Teletsk lake, confluence of Katun and Bia rivers form Ob river), general photography of Carpathian region on both sides of track and of the river valleys in Moldova, gulley and ravine topography of Central Russia up to Volga river, steppe on the left shore of Volga river to the south of Saratov including Y. A. Gagarin’s landing site in nadir, petroleum deposits along both shores of the Ural river and oil drilling fields, former Soviet Army fire ranges in Germany and coal pits after reclamation, scenic shots of Central America and Caribbean basin for educational purposes, and the Gulf Stream.]*

Weekly Science Update *(Expedition Seventeen -- Week 16)*

3-D SPACE: In progress.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Measurements continue in FGB module. Last memory card exchange and data downlink have been successfully performed on 8/4.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-2/CGBA-5 (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus 5): Continuing.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): EuTEF platform is nominal, with temperatures now steadily reaching normal levels after high beta angles period. A DHPU (Data Handling Processing Unit) software patch is currently being developed to fix the link error issues encountered with DEBIE-2 and FIPEX instruments. - DEBIE-2: Instrument Operations Procedures (IOP's) performed for 24hrs duration, from 8/2 to 8/5. Generic status: link error still in work. However a

work-around allows for regular science data acquisition using an on-board IOP, but not yet in conjunction with any FIPEX IOP – a final software patch, which will enhance the present instrument capabilities, is under finalization on ground; - DOSTEL: On-going science acquisition; - EuTEMP: Currently inactive as planned; - EVC: Activities pending for 8/7; - EXPOSE: On-going science acquisition; - FIPEX: Science acquisition from 7/30 to 8/2. New FIPEX IOP started on 8/6 for 2.5 days; - MEDET: Continuous science acquisition since 7/30; - PLEGPAY: Currently in READY mode, no science data acquisition on-going; - TRIBOLAB: The instrument is currently in Stand-By Mode. The Ball-Bearing experiment would be restarted towards mid-Aug (i.e. Week#18). Analysis is on-going on ground.

FSL (Fluid Science Laboratory): FSL is back. Further FSL commissioning activities remain to be done (see following item).

GEOFLOW: On 8/5, Greg managed to fix the FSL Feedthrough Panel minor problem which prevented the continuation of activities since 7/28. On 8/6, the GEOFLOW EC (Experiment Container) check-out tests have been performed flawlessly. On 8/7, the very first Science Run was performed – exciting times! Thanks a lot, Greg, for your great help to fix FSL mechanical setup.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Planned.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer, ESA): In progress.

NUTRITION w/REPOSITORY: In progress.

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): In progress.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): "Greg, thanks for completing your Actiwatch download initialization session. We are targeting next week, the 11th–17th, for your second week of Sleep logging. Thanks for your participation."

SOLAR (Solar Monitoring Observatory): Present Sun observation window started on 7/31 and will continue until 8/12. All the instruments are nominal, and 2 criss-cross manoeuvres have been successfully performed on 8/4 and 8/6 (GMT219), respectively. - SOVIM: Sun irradiance measurements on-going during Sun observation window; - SOLSPEC: Solar mode and Lamps calibration measurements on-going on a daily basis during Sun observation window; - SOLACES: Sun measurements on-going with the various spectrometers (with and without Ionization Chambers).

SOLO: Planned.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): A troubleshooting plan has been developed to recover all the BIOLAB functionalities. On 8/4, BIOLAB has been activated from ground for about 5 hours, in order to get telemetry about the Smoke Detector sensor and perform a series of BIT (Built-In

Test) sequences. This test was positive and we can confirm the full functionality of the Smoke Detector sensor. Next steps will be resumed in the next coming weeks, starting with the BIOLAB Rotor A bellow test (ground only) and later on the remaining WAICO-#1ECs (Experiment Containers) will be disposed and replaced by 6 Reference ECs on Rotor B. Planning for this last activity is currently TBD.

CEO (Crew Earth Observations): Through 8/4 the ground has received a total of 4,002 frames of CEO images for review and cataloging. Photos this week had camera times corresponding to target list times for the following requests: Western Pamirs (34 frames-hazy, soft), Mount Rainier (single frame-clouds), Coast Mountains (10 frames of target area-mostly cloudy), and Slate Island Impact Crater (single frame-target not acquired). "Preliminary review indicates that we will require additional imagery for all of these targets. We'd like to acknowledge your nice oblique views of Tropical Storm Edouard, acquired in two sessions during the afternoon of 8/4. The storm-precautionary closure of JSC that day and the next precluded any timely processing and release of your images. The hurricane season is still young and you will likely have more chances to photograph these dynamic events. An Increment 17 image acquired on 5/29 will be posted on NASA/GSFC's Earth Observatory website this weekend. The photo is a rare, striking view of the Pyramids of Dashur, Egypt (almost all good photos to date of pyramids are of the ones at Giza). Good illumination and focus accentuate the location and shape of these ancient structures.

CEO photo targets uplinked for today were **Kwanza Basin, NW Angola** *(good pass across the center of this site. Mapping swath of overlapping images at nadir was requested as a basic mapping tool for this rapidly changing area. Visual cues were the linear forested ridges at right-angles to track),* **East Libya megafans** *(ancient rivers sourced in the Tibesti Mountains when the climate of the Sahara was wet [> 8000 years ago] have laid down vast spreads of sediment as a series of large fans ["megafans"] hundreds of km long and wide. With more than 150 megafans recently discovered worldwide, the significance of megafans has only recently been understood. A continuous pattern of criss-crossing stream channels, large and small, covers the entire surface of megafans. Looking right beyond the black Namus volcano, Greg's visual cue, for detailed overlapping images of the flat channel-covered plains),* **Gordion, Turkey archaeological site** *(a close repeat of a prior pass on 8/7 put this archeological left of track. A mapping swath looking ~45 degrees left should have captured this famous site),* **Mount Vesuvius, Italy** *(a close repeat pass puts Vesuvius right of track at the head of the prominent Bay of Naples),* **Palmyra Atoll, central Pacific** *(this 6 mile-long atoll is surrounded by a continuous reef which is the scientific feature of interest. Detailed handheld images of coral reefs are being widely used),* and **Kingman Reef, equatorial pacific Ocean** *(this 4 mile-long, V-shaped atoll appeared left of track. Handheld imagery is a major component in the effort to map coral reefs worldwide)*.

CEO photography can be studied at this “Gateway” website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:24am EDT [= epoch]):*
Mean altitude -- 350.6 km
Apogee height -- 357.6 km
Perigee height -- 343.6 km
Period -- 91.55 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0010411
Solar Beta Angle -- -15.9 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.73
Mean altitude loss in the last 24 hours -- 53 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55692

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
08/13/08 -- ATV Reboost (~3:30am EDT)
09/02/08 -- Progress M-64/29P undocking, from FGB nadir
09/07/08 -- ATV1 undocking, from SM aft port (loiter until 9/29 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch (~3:03am EDT)
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port, ~4:51am)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir) or 10/24?
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/25/08 -- Progress M-65/30P undocking & deorbit
11/26/08 -- Progress M-66/31P launch
11/30/08 -- Progress M-66/31P docking
02/09/09 -- Progress M-66/31P undocking & deorbit
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/24/09 -- STS-119/Discovery/15A undocking
02/26/09 -- STS-119/Discovery/15A landing (nominal)

03/25/09 -- Soyuz TMA-14/18S launch
03/27/09 – Soyuz TMA-14/18S docking (DC1)
04/05/09 -- Soyuz TMA-13/17S undocking
04/07/09 -- Progress M-67/32P undocking & deorbit
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/25/09 -- Soyuz TMA-15/19S launch
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking)**
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/08/08
Date:	Friday, August 08, 2008 1:34:26 PM
Attachments:	

ISS On-Orbit Status 08/08/08

All ISS systems continue to function nominally, except those noted previously or below. *Light-duty day for the crew of CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff*.

In continuing support of the COL FSL (Columbus Orbital Laboratory/Fluid Science Lab) facility, the FE-2 completed the insertion of a blank DLT (Digital Line Tape) cartridge in the FSL VMU (Video Management Unit) tape recorder. *[The activity, scheduled (and reported) yesterday (when FSL was powered off), was aborted and rescheduled for today since VMU tape insertion can only be done with the FSL powered on and tape removal only before FSL deactivation.]*

Also in the COL, Chamitoff locked the FSL FCE (Facility Core Element) to fix it for the acceleration forces caused by the ATV reboost next week (scheduled for 8/13, ~3:430am EDT).

The CDR terminated the discharge/charge cycle on the second pair of NiMH (Nickel Metal Hydride) batteries for the Russian BMD (Biomedical Device) PZE STIMUL-01 experiment, in preparation for an upcoming training session of physical stimulation/ conditioning of the two cosmonauts. The first battery set was charged yesterday. *[The neuromuscular myostimulator suit STIMUL-1, which uses electrical stimulation to contract and relax leg muscle fibers for conditioning, is part of the suite of BMS (Biomedical Support) systems under development at the Moscow IBMP (Institute for Biomedical Problems) for long-duration spaceflights including piloted Mars missions.]*

In support of upcoming JAXA payload operations in the Kibo JPM (JEM Pressurized Module), Gregory prepared the MEU (Measurement Experiment Unit) for activation & checkout, inserting its cultivation chamber Bs and installing the MEU Bs in the CBEF (Cell Biology Experiment Facility) incubator. Later, after CBEF control start by ground commanding, Greg performed a visual inspection of the CBEF 1G door

lock.

FE-1 Kononenko performed a controlled shut-down of the US EHS VOA (Environmental Health System-Volatile Organic Analyzer), leaving inlet & exhaust caps plus power switch in the same configuration. The VOA RPC (Remote Power Controller) was power-cycled from the ground.

Meanwhile, the CDR initiated (later terminated) an oxygen refresh of the cabin atmosphere with O_2 from Progress M-64/29P.

The FE-2 conducted the regular bi-monthly reboot of the File Server SSC (Station Support Computer) laptop. *[Rebooting the SSC requires about 15 sec of waiting between shutdown and turning it back on. It may take up to 15 minute for the File Server to fully complete the startup.]*

Working from the Russian discretionary task list, Kononenko conducted the regular status check on the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

Sergey performed the routine daily servicing of the SM (Service Module)'s SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Oleg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~8:15am EDT, Sergey, Oleg and Greg held the periodic crew conference with the Expedition 18 crew, via S-band/audio space-to-ground (S/G2) and Private 2. *[This conference is scheduled once every two weeks, between the ISS crewmembers and Steve Lindsey, Head of the Astronaut Office.]*

TVIS Update: Replacement of the treadmill roller bearings is still scheduled next week on 8/11 & 8/12. Ground engineers are working on a repair method for the belt

tear that is durable and won't cause further hardware damage. Before the roller bearing R&R and belt repair, to be performed in conjunction, the crew will be scheduled for a Repair Procedures Printout & Review activity. Delivery of a new tread belt has been proposed for manifesting on Progress 30P.

SPDM Update: Yesterday, the Special Purpose Dexterous Manipulator "Dextre" had its first successful ground-commanded motion. Both arms' OTCMs (ORU Tool Changeout Mechanisms) were satisfactorily checked out. Next SPDM checkout is planned for 8/11 (Monday).

MT Update: Today at ~2:05-3:35pm EDT, after inhibition of Russian thrusters, ground commanding will move the Mobile Transporter from WS-4 (Worksite 4) to WS-6 to provide additional views from the SSRMS (Space Station Remote Manipulator System) during the planned JEM RMS (Robotic Manipulator System) checkout planned for next week. Thrusters will be re-enabled at ~4:45pm. Later (time frame 8/27-29), the MT will be translated from WS-6 to WS-7 for performing grapple & power checkouts on the ESP-3 (External Stowage Platform 3), mounted on the zenith side of the P3 truss element. *[ESP-3 is an external pallet that can securely hold up to seven ORUs (Orbital Replacement Units).]*

CEO (Crew Earth Observations) photo targets uplinked for today were **Nile delta, Egypt** *(left of track, shooting a mapping swath of overlapping images following the line where the green agricultural lands meet the yellow desert sands),* **Saharan Dust, W Atlantic** *(Dynamic event. Visible Saharan dust reaching the western hemisphere is a relatively rare event [although diffuse Saharan dust is transported the Americas every month of the year]. Aiming left toward the horizon for images of the dust front. Best views were looking rearward roughly along the line of the dust front after ISS crossed cross the islands. Greg was to try to get any landmass into the views, such as Cuba or neighboring islands),* **Georgia Coastal Ecosystems** *(mapping swath of overlapping images was requested following along the Georgia coastline at nadir, to document several processes operating in these wetlands [the dynamic event haze front, off Florida, could be imaged looking right),* and **Mount Rainier, WA** *(Mt. Rainer is the largest volcano visible right of track and lies immediately inland of Tacoma and Seattle. Detailed images were requested)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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Eccentricity -- 0.0010312
Solar Beta Angle -- -11.7 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.73
Mean altitude loss in the last 24 hours -- 40 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55676

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10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
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02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
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05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May ’09)**
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/07/08
Date:	Thursday, August 07, 2008 2:55:28 PM
Attachments:	

ISS On-Orbit Status 08/07/08

All ISS systems continue to function nominally, except those noted previously or below.

As part of the crew's regular morning inspection tour, CDR Volkov began his workday with the routine checkup of DC1 (Docking Compartment) circuit breakers and fuses. *[The monthly checkup in the "Pirs" module looks at AZS circuit breakers on the BVP Amp Switch Panel (they should all be On) and the LEDs (light-emitting diodes) of 14 fuses in fuse panels BPP-30 & BPP-36.]*

For the Russian KPT-2 science payload BAR-RM, the CDR terminated battery charging for the "Kelvin-Video" instrument and started the process on the TTM-2 anemometer/thermometer's power pack. After about 4 hrs, the charging was terminated. *[Objective of the payload is to experiment with ISS leak detection based on environmental data anomalies (temperature, humidity, and ultrasound emissions) at leak locations. The payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/thermometer (TTM-2), an ultrasound analyzer (AU-01), and a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station. Measurements are taken in specific zones (13 in SM PkhO and 4 in DC1), both with lights & fans turned on and off.]*

Later, in preparation for an upcoming training session of physical stimulation/ conditioning of the two cosmonauts with the Russian BMD (Biomedical Device) PZE STIMUL-01, the CDR removed the first pair of freshly charged NiMH (Nickel Metal Hydride) batteries from the payload's charger device and initiated the discharge/ charge cycle on the second pair. *[The neuromuscular myostimulator suit STIMUL-1, which uses electrical stimulation to contract and relax leg muscle fibers for conditioning, is part of the suite of BMS (Biomedical Support) systems under development at the Moscow IBMP (Institute for Biomedical Problems) for long-*

duration spaceflights including piloted Mars missions.]

FE-1 Kononenko completed outfitting the FGB module with new stowage structures, transferring additional enclosures from the ATV (Automated Transfer Vehicle) for installation in FGB zones 35B, V (panel 407) to provide more efficient stowage spaces behind panels and improve airflow/circulation;

Afterwards, Oleg stowed a variety of equipment in the new FGB enclosures, such as two CTBs (Cargo Transfer Bags) with IVA (Intravehicular Activity) Seal Kits from Node-2 and an IFHX (Interface Heat Exchanger).

Sergey Volkov set up the equipment for his third session with the Russian experiment MBI-18 DYKHANIE ("Respiration", "Breathing"), then undertook the session, controlled from the RSE-Med laptop, followed later by Oleg Kononenko who also completed the experiment for the third time. The crewmembers took photographs of each other working the hardware, then closed down the payload and stowed it. *[Dykhanie-1 uses two body belts (PG-T/thoracic, PG-A/abdominal), a calibrator, resistor, mouthpiece, etc., to study fundamental physiological mechanisms of the external breathing function of crewmembers under long-duration orbital flight conditions. During the experiment, physiological measurements are taken and recorded with a pneumotachogram, a thoracic pneumogram, an abdominal pneumogram, and pressure data in the oral cavity. All experimentally derived plus salient environmental data along with personal data of the subject are recorded on PCMIA card for return to the ground at end of the Expedition. Objectives include determining the dynamics of the relationship between thoracic (pectoral) and abdominal breathing function reserves and their realization potential during spontaneous breathing, the coordinated spontaneous respiratory movements in terms of thoracic and abdominal components of volumetric, time & rate parameters of spontaneous respiratory cycle, identification of the features of humoral-reflex regulation of breathing by dynamics of ventilation sensitivity of thoracic and abdominal components to chemoreceptor stimuli, etc. Overall, the experiment is intended to provide a better understanding of the basic mechanisms of pulmonary respiration/gas exchange gravitational relations of cosmonauts.]*

FE-2 Chamitoff conducted another lengthy session with the SHERE (Shear History Extensional Rheology Experiment) payload, proceeding through the individual experiment steps by –

- Activating the MSG (Microgravity Science Glovebox) in the US Lab,
- Powering on the SHERE hardware,
- Accessing the CGBA (Commercial Generic Bioprocessing Apparatus) to install the SHERE FM (Fluid Module) #1,
- Supporting the first SHERE experiment run (Test Point 23),
- Transferring the module with the fluid sample,

- Installing FM #26 for the second experiment run (Test Point 5),
- Removing the FM from the CGBA and transferring SHERE data,
- Turning off the SHERE/CGBA equipment,
- Transferring the data files to the MSG laptop, and
- Powering down the MSG.

[Background: Rheology is the study of the deformation and flow of matter under the influence of an applied stress which might be, for example, a shear stress or extensional stress. In practice, rheology is principally concerned with extending the "classical" disciplines of elasticity and (Newtonian) fluid mechanics to materials whose mechanical behavior cannot be described with the classical theories. SHERE is designed to study the effect of preshear on the transient evolution of the microstructure and viscoelastic tensile stresses for monodisperse dilute polymer solutions in the MSG. Collectively referred to as "Boger fluids," these polymer solutions have become a popular choice for rheological studies of non-Newtonian fluids and are the non-Newtonian fluid used in this experiment. The SHERE hardware consists of the Rheometer, Camera Arm, Interface Box, Cabling, Keyboard, Tool Box, Fluid Modules, and Stowage Tray.]

The FE-2 completed the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WRM (Water Recovery & Management) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week. The current card (17-0002U) lists 34 CWCs (Contingency Water Containers, ~1314.1 L total) for the four types of water identified on board: technical water (535.2 L, for Elektron, flushing & hygiene, incl. 487.2 L flushing-only water because of* Wautersia *bacteria), potable water (706.7 L, incl. 174.6 L currently for flushing only), condensate water (64.3 L), waste/EMU dump and other (7.9 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

In preparation for another run with the US SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment, Gregory first downloaded SLEEP data from his Actiwatch to the HRF-1 (Human Research Facility 1) laptop for subsequent downlink and verification by the support scientist, then re-initialized and donned the Actiwatch. *[To monitor his sleep/wake patterns and light exposure, Chamitoff now wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout this run. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

Sergey performed the routine daily servicing of the SM's SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities,*

replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]

Oleg conducted the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

In continuing support of the COL FSL (Columbus Orbital Laboratory/Fluid Science Lab) facility, Greg inserted a blank DLT (Digital Line Tape) cartridge in the FSL VMU (Video Management Unit) tape recorder.

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Volkov transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~4:15am EDT, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU/*Glavnaya operativnaya gruppa upravleniya* = *“Main Operative Control Group”*), including Shift Flight Director (SRP), at TsUP-Moscow via S-band/audio, phone-patched from Houston and Moscow.

At ~8:45am, Sergey & Oleg linked up with TsUP stowage specialists via S-band to conduct the weekly IMS tagup, discussing stowage issues, equipment locations and ATV & Progress cargo transfers.

At ~10:15am, the crew supported two interactive PAO TV interviews with US media of ~10 min each: KHOU-TV, Houston, TX (Jeremy Desel), and Cal Pol Magazine, San Luis Obispo, CA (Scott Roark).

TVIS Update: Replacement of the treadmill roller bearings is scheduled next week on 8/11 & 8/12. Before the change-out, the torn belt must be repaired with a patch, to be created and installed by the crew. Only after this procedure is completed, the scheduled roller bearing change-out can be performed, since it involves manipulation and stretching of the tread belt during the change-out, which could propagate the tear. Delivery of a new tread belt is proposed on Progress 30P.

SPDM Update: The Special Purpose Dexterous Manipulator “Dextre” was powered-up on Monday for installation of an Arm-2 Shoulder Joint software patch.

After patch installation, the polarity inversion error that occurred initially during the 1J/A mission (3/19/08) re-occurred. Preliminary analysis indicates the problem is in an ambiguity switch returning an inconsistent value. This ambiguity switch is only used during power-up and for a specific range of angles. In the near term, parking the arm at a specific angle can work around the issue. In the long term, this problem can be resolved through software updates.

MT Update: Tomorrow (8/8, ~2:05-3:35pm EDT), the Mobile Transporter will be moved from WS-4 (Worksite 4) to WS-6 to support JEM RMS (Japanese Experiment Module Robotic Manipulator System) checkouts.

CEO (Crew Earth Observations) photo targets uplinked for today were **Kwanza Basin, Angola** *(the Kwanza basin is undergoing rapid economic development, especially around the capital city Luanda, as Angola becomes a major oil exporter. ISS CEO imagery will be used as "baseline" imagery against which to measure future growth [settlements, railroads, highways, etc.]. A mapping swath looking obliquely left will ensure capturing the site. Visual cues are straight ridges extending away from track),* **Gordion, Turkish archaeological site** *(this rich archeological site was a city [capital of Phrygia] 800 years BCE where King Midas reigned. It is also the city where Alexander the Great cut the Gordion knot with his sword. For the last century Turkish and US researchers have excavated here. They have requested oblique views to illustrate publications and presentations. Shooting left for context views. A mapping swath will ensure capturing the site),* **Mount Vesuvius, S. Italy** *(looking near nadir. Visual cues are [1] the peninsula leading out to the Isle of Capri; and [2] Vesuvius's volcanic cone itself which is a prominent dark circular feature in the coastal plains just south of Naples),* and **Haze SE USA** *(looking left after crossing Cuba for the margin of a hazy airmass moving offshore from Georgia. Recent high pressure conditions have concentrated "aerosols" [smog, smoke, dust and other materials] in the lower atmosphere. These are especially visible from space as Greg looked obliquely through the atmosphere [giving a longer "line of sight" through the pollution]. Images of haze are effective if the margin/front between clear and hazy air can be detected. The smog front was expected to be approximately over southern Florida during the overflight).*

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 3:59am EDT [= epoch]):*
Mean altitude -- 350.7 km
Apogee height -- 357.6 km
Perigee height -- 343.8 km
Period -- 91.55 min.

Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0010247
Solar Beta Angle -- -7.4 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.73
Mean altitude loss in the last 24 hours -- 40 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55658

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
08/13/08 -- ATV Reboost
08/30/08 -- Progress M-64/29P undocking, from FGB nadir
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
03/25/09 -- Soyuz TMA-14/18S launch
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May ’09)**
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/06/08
Date:	Wednesday, August 06, 2008 1:19:35 PM
Attachments:	

ISS On-Orbit Status 08/06/08

All ISS systems continue to function nominally, except those noted previously or below. *Today is FE-2 Chamitoff's 46th birthday.* ***Happy Birthday, Gregory!***

FE-1 Kononenko serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out"-to-vacuum cycle on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~5:15pm EDT. Filter bed #1 was regenerated yesterday. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time done: 7/28 & 7/30).]*

FE-2 Chamitoff continued commissioning preparations in the JAXA Kibo JPM (JEM Pressurized Module). *[Activities included first turning off power supply from the Saibo & Ryutai Rack UDCs (Utility DC-to-DC Converters) to the MMA NCU & RSUs (Microgravity Measurement Apparatus/Network Control Unit & Remote Sensor Units), then reconfiguring the FPEF (Fluid Physics Experiment Facility) in two steps from launch to operational configuration, including securing the 3-D camera at a temporary position and verifying its focus setting. Later, power from Saibo & Ryutai was turned on again and the NCU/RSUs and MLT (MMA Laptop Terminal) activated.]*

Kononenko performed scheduled IFM (in-flight maintenance) on the Service Module (SM)'s condensate water processor (SRV-K2M) by removing and replacing its water-conditioning unit purification columns (BK BKV). The old unit was disposed of in Progress 29P. (Last time done: 3/23/08). *[The SRV-K2M, with its BKO multifiltration unit, converts collected condensate into drinking water by removing dissolved mineral and organic impurities from the condensate. Downstream from it the condensate water is treated in the BKV water conditioning unit with salts for taste and silver ions for preservation, before it flows to the KPV potable water container from which the reclaimed water is dispensed warm or hot for drinking and*

preparation of food and beverages.]

CDR Sergey Volkov performed maintenance on the SM's Internal Thermal Loop 2 (KOB2) to determine the technical condition of the filled hydraulic loop by assembling and leak-checking pump and pressure gauge equipment, then using it to measure the free volume (of air) in the loop, adjusting the operational pressure in KOB2 accordingly, and finally disassembling the equipment. *[There are two SOTR KOB cooling loops in the SM, each equipped with two redundant pump panels with two redundant pumps each.]*

Oleg initiated discharge/charge cycle on the first pair of four NiMH (Nickel Metal Hydride) batteries for the Russian BMD (Biomedical Device) PZE STIMUL-01 payload in the payload's charger device in preparation for the upcoming physical stimulation/conditioning training of the two cosmonauts with the device. *[The neuromuscular myostimulator suit STIMUL-1, which uses electrical stimulation to contract and relax leg muscle fibers for conditioning, is part of the suite of BMS (Biomedical Support) systems under development at the Moscow IBMP (Institute for Biomedical Problems) for long-duration spaceflights including piloted Mars missions.]*

With the FGB solar arrays partially retracted and no longer in use, Kononenko continued the dismantling of the SOSB Solar Array Orientation System in the FGB, today removing a static converter (B15, one of two), the communications unit (B01) and the amplifier unit (B03) from behind panel 407, placing the blocks in temporary storage for recycling. The logic & control unit (B14) was removed earlier and used to replace the failed B14 block in the SM. *[The FGB SOSB comprises Sun sensors, amplifier-converter unit, amplifier unit, logic & control unit, communications unit, static converter, and solar array drive.]*

Gregory had an hour reserved to relocate & rearrange stowage items in Node-2 for more efficient ops and to create more space for additional crew provisions (food) from the "Jules Verne" ATV (Automated Transfer Vehicle).

The FE-2 also checked out the U.S. SLM (Sound Level Meter) instrument and then used it to conduct the periodic (once every two months) noise level measurement program in all modules of the station for a 2-hr acoustic survey, followed by transfer of the recorded data to the MEC (Medical Equipment Computer). *[A total of 45 acoustic measurements were obtained at four locations in the ATV1, six locations in Node-2, 11 locations in the SM, eight locations in the COL, nine locations in the Kibo JPM, and four locations in the Kibo JLP. The survey also includes three crew preference locations taken at their perceived loudest locations in the station. The SLM gives instantaneous noise levels and their frequency spectra, which are transferred to the MEC laptop via an RS232 cable and later downlinked with regular*

CHeCS (Crew Health Care Systems) data dump or via OCA.]

Volkov set up the TTM-2 and “Kelvin-Video” batteries for charging for another operational run of the Russian KPT-2 science payload BAR-RM. Charging will be terminated tomorrow (8/7), followed by closeout ops and re-stowing. *[Payload objective is to experiment with ISS leak detection based on environmental data anomalies (temperature, humidity, and ultrasound emissions) at leak locations. The payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/thermometer (TTM-2), an ultrasound analyzer (AU-01), and a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station. Measurements are taken in specific zones (13 in SM PkhO and 4 in DC1), both with lights & fans turned on and off.]*

Kononenko performed the routine daily servicing of the SM’s SOZh system (Environment Control & Life Support System, ECLSS). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Later, working off the discretionary “time permitting” task list, Oleg also performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

An additional job on the Russian voluntary task list for Kononenko was the regular status check on the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-1, FE-2) and RED resistive exercise device (CDR, FE-1, FE-2). Later, Oleg transferred the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

The station residents were scheduled for their regular periodic PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Sergey at ~1:00pm, Oleg at ~2:15pm, Gregory at ~3:30pm EDT.

At ~3:10pm, the ISS crew is scheduled for their regular weekly tagup with the Lead

Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC (Station Support Computer)]*.

At ~4:25pm, Chamitoff will hold his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop) , undoubtedly to enjoy best birthday wishes from his family.

VolSci Program Preview: For the weekend of August 9, Greg Chamitoff was offered two choices for the Voluntary Weekend Science program: (1) an "operations improvement" session with SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellites) with all three satellites; and (2) a LOCAD PTS (Lab-On-A-Chip Application Development – Portable Test System) surface sampling session in COL (Columbus Orbital Laboratory) using Glucan LAL cartridges, targeting fungus on ISS surfaces.

No CEO (Crew Earth Observations) photo targets uplinked for today due to yesterday's JSC stand-down.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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Perigee height -- 343.8 km
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Eccentricity -- 0.0010245
Solar Beta Angle -- -2.9 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.73
Mean altitude loss in the last 24 hours -- 40 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55645

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
08/13/08 -- ATV Reboost
08/30/08 -- Progress M-64/29P undocking, from FGB nadir
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
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10/01/08 -- **NASA 50 Years** (official)

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07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
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12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/05/08
Date:	Tuesday, August 05, 2008 6:57:30 PM
Attachments:	

ISS On-Orbit Status 08/05/08

All ISS systems continue to function nominally, except those noted previously or below.

> Due to the threat from Tropical Storm/Hurricane Edouard, NASA JSC closed down yesterday at ~1:00pm EDT and currently remains closed until tomorrow (8/6) morning. ISS Mission Control Center is operating on a reduced weekend support ("GEMINI") level. Onboard schedules will be re-planned as necessary. Crew activities as timelined in the original work schedules are summarized in the following, and actual task completions will be statused as soon as available.

CDR Volkov's timeline for today called for Sergey to –

- Perform the periodic service of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system, and to terminate the process at ~4:20pm EDT, with Bed #2 regeneration to follow tomorrow *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time: 6/23&24)];*
- Work in the DC1 Docking Compartment to mate the BNP telemetry connector;
- Replace the DC1's PF1 & PF2 dust filters and clean the V1 & V2 fan grilles;
- Conduct the periodic checkout/verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the passageways SM PrK (Service Module Transfer Compartment)–ATV, PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1;
- Take care of the routine daily servicing of the SOZh system (Environment

Control & Life Support System, ECLSS) in the SM;

- Conduct a teleconference (at ~7:55am) with ground specialists to discuss the RS1 laptop;
- Support a telephone interview (at ~8:05am) with an editor of the magazine Rossiyskiy Kosmos (Russian Space);
- Transfer US condensate water, collected from the US CCAA (Common Cabin Air Assembly) air conditioner in a CWC (Contingency Water Container), to a Russian EDV container for processing as technical water for the Elektron oxygen (O_2) generator;
- Perform the periodic (monthly) functional closure test of the Vozdukh CO_2 removal system's spare emergency vacuum valves (AVK), in the spare parts kit *[The AVKs are critical because they close the Vozdukh's vacuum access lines in the event of a malfunction in the regular vacuum valves (BVK) or a depressurization in the Vozdukh valve panel (BOA). Access to vacuum is required to vent CO_2 during the regeneration of the absorbent cartridges (PP). During nominal operation, the AVK valves remain open.];*
- Install thermal insulation on the newly repaired SKV-2 air conditioner; and
- Take the periodic readings of potentially harmful atmospheric contaminants in the SM, using the CMS (Countermeasure System), a component of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, which uses preprogrammed microchips to measure H_2CO (Formaldehyde, methanal), CO (Carbon Monoxide) and NH_3 (Ammonia), taking one measurement per microchip.

FE-1 Kononenko's timeline for today called for Oleg to –

- Remove the B13 logic unit of the FGB Solar Array Orientation System, with the latter powered down;
- Transfer more enclosures from the ATV for installation in the FGB in zone 35A (panel 403) to provide more efficient stowage spaces behind FGB panels and improve airflow/circulation;
- Conduct the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur);
- Restow selected items in the FGB; and
- Support the BIO-5 Rasteniya-2 ("Plants-2") experiment, which researches growth and development of plants (peas) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}), by monitoring the greenhouse, taking pictures and downloading them to the ground.

FE-2 Chamitoff's work schedule for today called for Gregory to –

- Continue preparing the JAXA Kibo JPM (JEM Pressurized Module) for payload operation by setting up and checking out the Robotics BDS (Backup Drive System);
- Connect and turn on the MMA (Microgravity Measurement Apparatus) and MLT (MMA Laptop Terminal) on the RYUTAI Rack;
- Configure and activate the MMA/MLT on the SAIBO Rack;
- Activate and check out the JEM Robotics System (RMS) power switch;
- Start the gas supply on the CGSE (Common Gas Support Equipment), with its valve unit and four CO_2 & Argon GBUs (gas bottle units); and
- Prepare and conduct the POC (Portable Onboard Computer) Software Cycle 11 transition, including the COL PWS (Columbus Orbital Laboratory Portable Workstations), from CDs (Compact Disks) after retrieving and auditing them.

Volkov & Kononenko had three hours set aside for more trash cargo transfers to Progress 29P.

The station residents were scheduled for their regular periodic PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Gregory at ~10:25am, Oleg at ~12:05pm, Sergey at ~12:40pm.

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Sergey transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure
on the HRM storage medium (done six times a week).

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
08/4-6/08 -- MCC-Houston closed due to Tropical Storm (TS)/Hurricane Edouard
08/13/08 -- ATV Reboost
08/30/08 -- Progress M-64/29P undocking, from FGB nadir
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch

10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
03/25/09 -- Soyuz TMA-14/18S launch
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May '09)**
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/04/08
Date:	Monday, August 04, 2008 1:36:57 PM
Attachments:	

ISS On-Orbit Status 08/04/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 16 of Increment 17.*

> ***Tropical Storm/Hurricane Edouard:*** *At ~1:00pm EDT, NASA JSC (Johnson Space Center) closed down today in preparation for TS Edouard, which is expected to make landfall near Houston/Galveston around 8:00am tomorrow morning after forming rapidly over the weekend in the Gulf of Mexico. MCC(Mission Control Center)-Houston is being kept active, powered and with S-band command & telemetry capability, but at the GEMINI level (essentially nominal Houston weekend support) until Wednesday morning (8/6). BCC (Backup Control Center) in Moscow will not be activated. Tomorrow's onboard timeline will be scrubbed to reduce the need for FCT (Flight Control Team) support. The Center is expected to return to nominal operations sometime Wednesday morning. Nominal, full team console support will resume on Wednesday, Orbit 3. On today's timeline, TVIS treadmill repair and SPDM (Special Purpose Dexterous Manipulator) "Dextre" commissioning activities have been deferred and will be rescheduled in the future. Any changes during today's crew activities will be reported ASAP.*

Before breakfast, the CDR, FE-1 and FE-2 completed another periodic session of the Russian biomedical routine assessment PZEh-MO-7/Calf Volume Measurement (fifth for CDR & FE-1, third for FE-2). *[Calf measurements (left leg only) are taken with the IZOG device, a custom-sewn fabric cuff that fits over the calf, using the knee and lower foot as fixed reference pints, to provide a rough index of deconditioning in zero-G and effectiveness of countermeasures.]*

Gregory Chamitoff ended his third session with the NASA/JSC experiment NUTRITION w/Repository by collecting a final urine sample upon wakeup for storage in the MELFI (Minus-Eighty Laboratory Freezer for ISS). The sampling kit was then stowed away. *[The current NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

Later in the day, Volkov & Kononenko also completed the first part of the onboard "Profilaktika" (MBI-8, "Countermeasures") preventive health maintenance fitness test on the VELO bicycle ergometer, assisting each other in turn. Part 2, on the TVIS treadmill, is scheduled later this week (pending TVIS repair). *[Test procedure for MBI-8, which requires workouts on the VELO and TVIS, is identical to the Russian MO-5 assessment, but in addition to the nominal procedure it uses the TEEM-100M gas analyzer with breathing mask, a blood lactate test with the ACCUSPORT analyzer and REFLOTRON-4 accessories, and a subjective evaluation of physical exertion levels during the test (using the Borg Perceived Exertion Scale, viz., 10 steps from very light over hard and very hard to maximum). Results are entered on a log sheet. TEEM and ECG (electrocardiograph) data are transferred to the RSE-Med laptop, also on a tape cassette (Cardiocassette-2000), and prepared for later downlink via Regul-Packet comm. Results are also called down to specialists standing by at TsUP.]*

After deactivating the BITS2-12 onboard telemetry measurement system (which also required the Elektron oxygen generator to be turned off), Sergey Volkov performed major IFM (Inflight Maintenance) on the SM SA (Service Module Solar Array) system by removing its logic unit (B14M) and replacing it with the B14M removed earlier from the FGB. Later, BITS2-12 was turned back on.

While the Elektron was off, Oleg Kononenko conducted routine IFM on the SRVK-2M condensate water processor, removing its BKO multifiltration unit which has reached its service life limit. The old BKO was replaced with a new unit and stowed for deorbiting on Progress 29P. *[BKO contains five purification columns to rid the condensate of dissolved mineral and organic impurities. It has a service lifetime of ~450 liters throughput. The water needs to be purified for proper electrolysis in the Elektron O_2 generator.]*

At 7:36am EDT, the ground disconnected the ATV (Automated Transfer Vehicle)

electrically from the ISS while the Elektron was re-activated. This cause the lights to turn off in the ATV. ATV power was reconnected to the ISS at ~8:41am, and the lights came back on.

The FE-2 continued his activation & checkout work in the JAXA Kibo JPM (JEM Pressurized Module), preparing a sample for cultivation on the CBEF (Cell Biology Experiment Facility) Incubator Unit front surface for CBEF checkout.

Also in the Kibo laboratory, Chamitoff continued preparations for payload operations on RYUTAI and SAIBO racks, installing MMA (Microgravity Measurement Apparatus) equipment with two RSUs (Remote Sensor Units) and the MLT (MMA Laptop Terminal).

On SCOF (Solution Crystallization Observation Facility), the FE-2 installed the reference cell cartridge and MMA.

Chamitoff also conducted the periodic (monthly) CSA-CP (Compound Specific Analyzer-Combustion Products) maintenance/checkout, today on all four units. *[The CSA-CP is a passive cabin atmosphere monitor that provides quick response capability during a combustion event (fire). Its collected data are stored on a logger. Gregory replaced batteries on all units, then zero-calibrated all instruments (to eliminate drift in the combustion sensors). Following zero calibration, the backup units were stowed in the Node, along with the sampling pump, while the prime unit was deployed at the SM Central Post.]*

FE-1 Kononenko unstowed the three copies of the SODF (Systems Operation Data File) Emergency Books located in the SM, FGB and Lab and updated them with new/changed information.

CDR Volkov set up the equipment for transferring TEKh-20 PK-3+ (Plasma Crystal-3 +) experiment digital video data to the Russian BSPN Payload Server. After the transfer, the Telescience hardware was torn down for stowage.

Afterwards, Sergey began a new round of periodic preventive maintenance of cabin ventilation systems in the RS (Russian Segment), today cleaning the “Group A” fan grilles in the SM, while Oleg cleaned the protective TsV1 fan screen in the FGB.

Kononenko serviced the Matryoshka-R (RBO-3-2) radiation payload which has taken over the ESA/RSC-Energia experiment ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS/ALC) with its Spectrometer (AST) and ALC equipment on DC1 panel 429. *[Oleg downlinked data from PCMCIA (Portable Computer Memory Card International Adapter) cards ALC-949, ALC-951 and ALC-952, then activated the AST with the ALC-953 card.]*

The CDR performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The FE-1 conducted the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Gregory completed the periodic (monthly) inspection of the RED (Resistive Exercise Device) canister cords and accessories.

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), RED resistive exercise device (FE-2), and VELO bike with bungee cord load trainer (CDR/MBI-8, FE-1/MBI-8). Later, Oleg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

TVIS Noise/Failure Update: After anomalous noise was noted during TVIS (Treadmill with Vibration Isolation & Stabilization), downlinked audio & video troubleshooting files, followed by crew inspection on 8/1 & 8/2 revealed a tear in the belt, probably caused by FOD (Foreign Object Debris) that got lodged between two of the belt slats. Teams are working to develop a repair/tear propagation mitigation procedure, which should be ready tomorrow. Also, preparations are underway to launch a spare belt on Progress 30P. There are other exercise device options available on board, and TVIS functionality will be recovered ASAP.

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
08/4-6/08 -- MCC-Houston closed due to Tropical Storm (TS)/Hurricane Edouard
08/13/08 -- ATV Reboost
08/30/08 -- Progress M-64/29P undocking, from FGB nadir

09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
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02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
03/25/09 -- Soyuz TMA-14/18S launch
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May ’09)**
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/03/08
Date:	Sunday, August 03, 2008 3:22:47 PM
Attachments:	

ISS On-Orbit Status 08/03/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – rest day for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff. Ahead: Week 16 of Increment 17.*

Gregory Chamitoff started out on Part 2 of his session with the NASA/JSC experiment NUTRITION w/Repository. This is an all-day session, the third for Greg, of collecting urine samples several times for 24 hrs through first void tomorrow morning. *[The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by supercold MELFI dewars), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

Sergey Volkov conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

Working off his suggested “time permitting” task list, FE-1 Kononenko conducted

another session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program, using the D2X digital camera with the F800 telephoto lens. *[Uplinked target areas were Patagonian glaciers and icebergs near South Georgia Island.]*

Also working from the discretionary task list, Oleg conducted another run of the Russian DZZ-2 "Diatomeya" ocean observations program, using the NIKON-F5 DCS still camera and the HDV (high-definition) video camcorder from SM window 8 for ~20 min to record high production water areas for obtaining data on color field composition in dynamic regions of the ocean and in near-estuary areas of large rivers, plus the current cloud cover above these waters, its rating, and special forms of cloud formation.

For the CDR, a discretionary task list job was another session for Russia's Environmental Safety Agency (EKON), making observations and taking KPT-3 aerial photography of environmental conditions of the Indian Ocean (Chagos Archipelago) and the New Zealand islands coastal area.

An additional job on the Russian voluntary task list for Kononenko was to perform the regular status check on the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

SHERE VolSci Update: Note to Gregory: “Magnificent! The SHERE team is ecstatic about your two successful test runs yesterday. As far as the team knows, you are the first person to successfully deploy a rheological fluid column in space. Congratulations!”

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this “Gateway” website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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11/12/08 -- STS-126/Endeavour/ULF2 docking
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07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
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12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/02/08
Date:	Saturday, August 02, 2008 8:51:12 PM
Attachments:	

ISS On-Orbit Status 08/02/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – mostly off duty for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff.*

Gregory Chamitoff had Part 1 of his third session with the NASA/JSC experiment NUTRITION w/Repository, for blood collection only, for which he had to forego exercising and food intake since yesterday for eight hours. Later today, the FE-2 will also set up the equipment for the 24-hour urine collections which start with the first void early tomorrow morning. *[After performing self-phlebotomy, i.e., drawing blood samples (from an arm vein), the samples were first allowed to coagulate in the Repository for 20-30 minutes, then spun in the HRF RC (Human Research Facility/Refrigerated Centrifuge) and finally placed in MELFI (Minus-Eighty Laboratory Freezer for ISS). No thruster activity was allowed during the blood drawing. The RC was later powered off after a temperature reset to limit wear on the compressor, and cleaned.]*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the SM dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

As part of the house cleaning, the crew also conducted regular maintenance inspection & cleaning on fan grilles in the FGB (TsV2), SM (VPkhO, VPrK, FS5, FS6 & FS9), DC1 (V3) screens and PF1/PF2 dust filters, as well as in the COL (Columbus Orbital Laboratory).

The FE-1 also checked up on the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem, gathering weekly data on Total Operating Time & "On" durations for reporting to TsUP-Moscow. Later, CDR Volkov temporarily powered down the POTOK air filtration system for the periodic cleaning of its pre-filter, using the vacuum cleaner with narrow-slit nozzle attachment.

Gregory filled out the regular FFQ (Food Frequency Questionnaire), his eighth, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

Chamitoff also had about half an hour reserved to work on the CMRS (Crew Medical Restraint System), stowed in the CHeCS (Crew Health Care Systems) rack, performing the periodic checkout and inspection of the system for upcoming standard CMO (Crew Medical Officer) proficiency training. *[The FE-2 inspected the CMRS for cracks in the board and/or metal fastener exposed on top of CMRS (found on the ground units), either of which could provide a high-voltage defibrillation ground path from the patient to ISS structure. The board-like CMRS allows strapping down a patient on the board with a harness for medical attention by the CMO who is also provided with restraints around the device. The device can be secured to the ISS structure within two minutes to provide a patient restraint surface for performing emergency medical procedures, such as during ACLS (Advanced Cardiac Life Support). It can also be used to transport a patient between the station and the Orbiter middeck. It isolates the crew and equipment electrically during defibrillations and pacing electrical discharges, accommodates the patient in the supine zero-G positions, provides cervical spine stabilization and, for a three-person crew, can also restrain two CMOs during their delivery of medical care.]*

At ~10:00am EDT, the crewmembers conducted their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP-Moscow timeline planners) via S-band/ audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

For today's VolSci (Voluntary Weekend Science) program featuring SHERE (Shear

History Extensional Rheology Experiment), FE-2 Chamitoff –

- Activated the MSG (Microgravity Science Glovebox),
- Powered on the SHERE hardware,
- Accessed the CGBA (Commercial Generic Bioprocessing Apparatus) to install the SHERE FM (Fluid Module) #25,
- Supported the first SHERE experiment run (Test Point 3),
- Transferred the module with the fluid sample,
- Installed FM #24 for the second experiment run (Test Point 13), ,
- Removed the FM from the CGBA, followed by SHERE data transfer,
- Turned off the SHERE/CGBA equipment,
- Transferred the data files to the MSG laptop, and
- Powered down the MSG.

Later, Chamitoff completed a run with the MedOps experiment WinSCAT (Windows Spaceflight Cognitive Assessment Tool), his second onboard session, by logging in on the MEC (Medical Equipment Computer) and performing the psychological evaluation exercise on the laptop-based WinSCAT experiment. *[WinSCAT is a monthly time-constrained questionnaire test of cognitive abilities, routinely performed by astronauts aboard the ISS every 30 days before or after the PHS (periodic health status) test or on special CDR's, crewmembers or flight surgeons request.]*

Kononenko performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Oleg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure
on the HRM storage medium (done six times a week).

At ~6:35am EDT, the FE-1 had his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

Weekly Science Update *(Expedition Seventeen -- Week 15)*

3-D SPACE: Third session by Greg Chamitoff has been successfully performed on 7/30.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Measurements continue in the FGB module.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-2/CGBA-5 (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus 5): "On 7/31, we had a successful activation of Silicate Garden Hab Side 2 in the afternoon and the crystals looked great at the start of the growth period. Images are being taken once per 90 seconds and will be decreased to once per 5 minutes at 7:00pm EDT today."

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): On 7/16, EuTEF encountered a MIL-Bus error (this happened similarly in the past). The platform has to be power-cycled and the entire EuTEF facility re-initiated. The instruments have been re-activated with some delay due to some minor mismatch in the sequence of commands sent from ground. Although this recurrent DHPU (Data Handling Processing Unit) problem does not prevent EuTEF to function, ground teams are

working hard to characterize it and find a fix. A DHPU software patch is currently being developed to fix the link error issues encountered with DEBIE-2 and FIPEX instruments.-- DEBIE-2: Instrument could not be restarted immediately after the DHPU problem on 7/27, and was finally re-activated on 7/28 for 2 x 24hrs science runs. Generic status: link error still in work. However, a work-around allows for regular science data acquisition using an on-board IOP (Instrument Operations Procedure), but not yet in conjunction with any FIPEX IOP – a final software patch, which will enhance the present instrument capabilities, is under finalization on ground;-- DOSTEL: On-going science acquisition;-- EuTEMP: Currently inactive as planned;-- EVC: Inactive this week;-- EXPOSE: On-going science acquisition;-- FIPEX: Instrument re-activated after DHPU problem on 7/27. Science acquisition since 7/30; -- MEDET: Instrument re-activated after DHPU problem on 7/27. Science acquisition since 7/30; - PLEGPAY: Currently in READY mode, no science data acquisition on-going;--TRIBOLAB: The instrument is currently in Stand-By Mode. The Ball-Bearing experiment would be restarted towards mid-Aug. Analysis is on-going on ground.

FSL (Fluid Science Laboratory): FSL is back but off. Further FSL commissioning activities remain to be done (see following item).

GEOFLOW: Thanks, Greg. for inserting the GEOFLOW Experiment Container on 7/28. However, it was not possible to activate FSL, as some laser switch inhibit did not seem to be positively engaged. That prevents to power on GEOFLOW and later on to proceed with check-out routines and finally first science runs. Ground teams are finalizing a corrective procedure for the crew.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Planned.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer, ESA): In progress.

NUTRITION w/REPOSITORY: In progress.

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): The SHERE team thanks Greg for selecting SHERE for Voluntary Science checkout activities performed on GMT 202. The checkout tests were a great success and showed that the SHERE hardware is functioning properly. The SHERE team looks forward to working with Greg again tomorrow, GMT 208, to perform the SHERE Dry Run. The recent fit problem with the Fluid Module Stowage Tray is being worked and will not affect the Dry Run.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): The HRP team thanks Greg for completing his first week of Sleep logs and his Actiwatch download initialization session. HRP is currently targeting the week of 8/4 for Greg's next week of Sleep logging and the week of 8/11 for his next Actiwatch download. Additional Sleep logging on non-targeted weeks is above and beyond and greatly appreciated by the PI.

SOLAR (Solar Monitoring Observatory): On 7/28, SOLAR experienced a spontaneous reboot, which was recovered on 7/29. It looks like SOLAR does not communicate anymore with the Columbus LAN network when under Columbus LAN switch#2 (CLSW#2) configuration. With the platform connected to the Columbus LAN switch #1 (CLSW#1), the SOLAR team is confident that everything works now for the next Sun observation window which starts on 7/31.-- SOVIM: Instrument confirmed fully functional; awaiting the Sun; -- SOLSPEC: Instrument confirmed fully functional; awaiting the Sun;-- SOLACES: Instrument confirmed fully functional; awaiting the Sun.

SOLO: Planned.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): The four ECs (Experiment Containers) of Rotor B are yet to be retrieved by the crew from the blocked Rotor B. BIOLAB could not be activated from ground yet; pending resolution of the Smoke Detector issue. A troubleshooting plan has been developed to recover all the BIOLAB functionalities. The first step of the BIOLAB recovery plan was to exchange an ESEM Power Board and this activity has been successfully performed on 7/25. On 7/26, BIOLAB was activated from ground for about 1 hour, in order to get telemetry about the Incubator Smoke Detector sensor. This test was positive, but engineering team would like to gather additional data during a longer activation test to confirm full functionality of the sensor. Next steps will follow, starting with the BIOLAB Rotor A bellow test (ground only) and later on the remaining WAICO-#1 ECs will be disposed and replaced by six Reference ECs on Rotor B. Planning for this last activity is currently TBD.

CEO (Crew Earth Observations): Through 7/15 the ground has received a total of 3,734 frames of CEO images for review and cataloging. "We have received some additional imagery this past week, but none with camera times corresponding to our CEO target request times. Most of these appear to be in South America and of good quality. One of your more striking Polar Mesopheric Cloud (PMC) photos, acquired last week, in a pass over central Asia will be published on NASA/GSFC's Earth Observatory webpage. Your PMC photos a welcome addition to our growing collection of images relevant to ISS program support of the International Polar Year (IPY). Thanks for your diligence in acquiring them!"

CEO (Crew Earth Observations) photo targets uplinked for today were **Red River Basin, TX** *(documenting the land use change and water levels of this meandering river boundary between Texas and Oklahoma, using the long lens settings and map along the river westward from Lake Texoma. This was a fair-weather nadir pass in mid-afternoon with an approach from the SW),* **Santa Barbara Coast, California** *(this target is a Long Term Ecological Research [LTER] site centered near Santa Barbara, CA. On this nadir, late-afternoon pass, clear skies were expected over the land areas as ISS approached from the SW. Using the long lens settings for a*

detailed mapping of the Santa Inez Mountains from Lompoc in the west to just north of Ventura to the east), and **Slate Islands Impact Crater** *(this 450 million year old impact is about 30-km in diameter and is revealed as a small cluster of island near the north coast of Lake Superior. As ISS tracked ENE- ward to the north of Lake Superior in late afternoon, Greg was to look for the target just right of track, using the long lens settings for detail)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 08/01/08
Date:	Friday, August 01, 2008 2:28:46 PM
Attachments:	

ISS On-Orbit Status 08/01/08

All ISS systems continue to function nominally, except those noted previously or below.

FE-2 Chamitoff began his workday with the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week. The current card is #17-0002T.]*

In preparation for today's Robotics activities, Chamitoff set up the SSRMS (Space Station Remote Manipulator System) videocamera connection by hooking up the UOP DCP (Utility Outlet Panel/Display & Control Panel) power bypass cable at the CUP RWS (Cupola Robotic Work Station).

Later, the FE-2 took the SSRMS through a prescribed maneuver sequence to allow close-up inspection & photography of the capture & retention snare in the arm's LEE B (Latching End Effector B). The bypass cable will be disconnected again later tonight.

Instead of conducting Greg's first session with the PFE-OUM (Periodic Fitness Evaluation - Oxygen Uptake Measurement) equipment at the HRF-2 (Human Research Facility 2) rack, Gregory & Sergey performed troubleshooting on the TVIS (Treadmill with Vibration Isolation & Stabilization), closely inspecting its chassis to track down the unusual noises developed by it on 7/30.

Preparatory to transferring more water from ATV (Automated Transfer Vehicle/ Water Delivery System) Tank #1, FE-1 Kononenko set up and conducted a leak check of the tank's internal expulsion bladder.

Chamitoff terminated the 24-hr NODE-2/JPM (JEM Pressurized Module) Vestibule depress & leak check started yesterday. *[During the leak check after*

depressurization to ~250 mmHg, the air pressure in the vestibule increased slowly to ~325 mmHg, which could be indicative of a leak from one of the adjacent modules into the vestibule. If this is the case, it would of course be impossible during a subsequent rapid depress event to completely isolate both adjacent modules from the vestibule. The decision was made that if the vestibule pressure remains steady close to 546 mmHg, the leak check will be considered successful. If not, Greg will still be GO to re-ingress the JPM. It was recommended to re-schedule additional troubleshooting and repeat of the leak check for a later date.]

After ingressing the JPM, Chamitoff did more outfitting by installing an IMV (Intermodular Ventilation) jumper from Node-2 to the JPM through the vestibule.

Gregory also transferred the disconnected PCS/PWS (Portable Computer System/ Portable Workstation) A31p laptops to the JPM after the leak check, followed by activating and rebooting them (except for the PLT/Payload Laptop which has developed some hard drive trouble).

Oleg completed another radiation data monitoring & logging session for flux & dose rate data with the Matryoshka-R radiation payload (RBO-3-2) and its LULIN-5 electronics box. *[Accumulated readings were recorded on a log sheet for subsequent downlink to TsUP/Moscow via the BSR-TM payload data channel.]*

The CDR worked on the Progress M-64/29P by transferring more collected discarded equipment and stowing it in the cargo ship-turned-trash can.

Kononenko had ~90 min set aside for the periodic equipment servicing in the SM's ASU toilet facility, changing out replaceable parts with new components, e.g., a filter insert (F-V), the pretreat container (E-K), and the E-K's hose. All old parts were discarded as trash. *[E-K contains five liters of pre-treat solution, i.e., a mix of H_2SO_4 (sulfuric acid), CrO_3 (chromium oxide, for oxidation and purple color), and H_2O (water). The pre-treat liquid is mixed with water in a dispenser (DKiV) and used for toilet flushing.]*

Continuing the latest round of preventive maintenance on the Russian Segment (RS) ventilation system, Volkov replaced the two dust filters PS1 & PS2 in the *Funktsionalnyi-Grusovoi Blok* (FGB), registering the change in the IMS (Inventory Management System).

Greg took measurements for the regular atmospheric status check for $ppCO_2$ (Carbon Dioxide partial pressure) in the Lab, SM (at panel 449) and COL (Columbus Orbital Laboratory), using the hand-held CDMK (CO_2 Monitoring Kit,

#1002), then deactivating it and returning it to its LAB1S2 stowage position.

The FE-2 conducted another one of the periodic offloadings of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1062) with the collected water slated for processing. No samples were required. *[Estimated offload time before reaching the tank's neutral point (leaving ~6 kg in the tank): ~30 min.]*

Kononenko performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Afterwards, working off the discretionary "time permitting" task list, Oleg also performed the daily IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Sergey transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Before sleeptime tonight, Chamitoff is to set up NASA's NUTRITION/Repository experiment hardware for his second session scheduled tomorrow. For the phlebotomy (blood sample draw), Greg has to start fasting 8 hrs before, i.e., tonight, with only water consumption allowed. *[The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by supercold MELFI dewars), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

At ~4:25am EDT, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU/*Glavnaya operativnaya gruppa upravleniya* =

"Main Operative Control Group"), including Shift Flight Director (SRP), at TsUP-Moscow via S-band/audio, phone-patched from Houston and Moscow.

At ~4:50am, Sergey & Oleg linked up with TsUP stowage specialists via S-band to conduct the weekly IMS tagup, discussing stowage issues, equipment locations and ATV & Progress cargo transfers.

At ~5:05am, the CDR & FE-1 conducted a teleconference with ground specialists to discuss the replacement of the failed SM SA (Solar Array) B14M unit with the unit removed from the FGB on 7/30.

At ~3:45pm, the ISS crew is scheduled for their regular weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC (Station Support Computer)]*.

At ~12:10pm, Chamitoff powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, & power supply) and conducted, at 12:15pm, a ham radio exchange with parties in Montreal, via CSA (Canadian Space Agency) ground station.

CEO (Crew Earth Observations) photo targets uplinked for today were **Bigach Impact Crater** *(this small impact site [8-km in diameter] is located in a remote region of southern Russia, northeast of Lake Balkhash not far from the Chinese border. Researchers have no useful photos of the site or the surrounding region. Therefore, on this fair-weather pass in late afternoon sun Greg was asked for a mapping strip from Lake Balkhash to Lake Zysan using the short lens settings. The site is a small, weathered feature variously estimated between 2 and 8 million years old),* **South Tibesti Megafans** *(once more Chamitoff was asked for a context mapping of the area of these subtle features in the desert to the south of the rugged volcanics of the Tibesti Mountains in northern Chad, using the short lens settings as Greg looked right of track in early afternoon light. As ISS tracked NE-ward, noting Lake Chad on the right, Greg was to begin a mapping strip all the way to the southern flanks of the mountains, marked by dark lava flows),* and **Tunis, Tunisia** *(the Tunisian capital is also a large port situated on a sheltering bay in the northeastern corner of the country. On this mid-afternoon, most of the city lied at nadir. Trying for a nadir mapping strip of the northwestern and northern urban margins and using the long lens settings for detail)*.

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/31/08
Date:	Thursday, July 31, 2008 9:09:23 PM
Attachments:	

ISS On-Orbit Status 07/31/08

All ISS systems continue to function nominally, except those noted previously or below.

Upon wake-up, Sergey Volkov terminated his seventh MBI-12 SONOKARD experiment session for the long-term Russian sleep study, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

FE-2 Chamitoff closed the hatches between the Kibo JPM (JEM Pressurized Module) and Node-2 for a vestibule leak check and left them closed overnight. The ground shut down the Inter/Intra Module Ventilation and the Smoke Detectors in the JPM and JLP (JEM Logistics Pressurized Section) prior to the leak check and it may occur when you are still in the JEM.

The TVIS treadmill has not been used for exercise since the crew reported hearing unusual noises yesterday. Audio, video, and still imagery were taken by the crew and downlinked for ground team analysis. The PFE w/OUM (Periodic Fitness Evaluation with Oxygen Uptake Measurement) activities are being deferred from tomorrow to accommodate an inspection of the TVIS chassis.

FE-1 Oleg Kononenko installed enclosures in FGB zones 16 & 19 (panels 224 & 225). He called down that he only had three small panels left to install and those would be done next week.

CDR Sergei Volkov conducted his monthly body fitness training using HMS (Health Maintenance System) hardware including ACLS (Advanced Cardiac Life Support) equipment which may be used in contingency situations where crew life is at risk. *[To maintain proficiency, the CMOs spend one hour per month reviewing HMS and ACLS equipment and procedures via the HMS CBT, and CBT (Computer Based Training (CBT) and the ACLS CBT. Maintaining proficiency with the HMS hardware and procedures is essential to successful ISS operations and well-being of the crew.]*

Volkov and FE-2 Greg Chamitoff performed a POC DOUG (Portable Onboard Computers/Dynamic Onboard Ubiquitous Graphics (DOUG) Software Review: this review for upcoming robotics activities on Friday when they are scheduled to fulfill their recurring proficiency requirements by maneuvering the arm's Latching End Effector (LEE) B above the Node 2 Zenith hatch window for diagnostic photography.

A scheduled leak check of the Node-2 to JPM vestibule was initiated this morning. The vestibule has been partially evacuated (to 325 mmHg) and the check will continue for eight hours. In preparation for the check which isolates the JPM, all laptops in the JPM were turned off due to the power to those units being disabled.

Chamitoff prepared two messages, the first for ARC (Ames Research Center) for a 'NASA Night' in August with the San Francisco Giants, who are also celebrating their 50th anniversary, and the second for a cancer research benefit endorsed by NASA.

Gregory also filled out the regular FFQ (Food Frequency Questionnaire), his seventh, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

In the SM, Volkov took the periodic readings of potentially harmful atmospheric contaminants with the CMS (Countermeasure System) component of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite which uses preprogrammed microchips to measure H_2CO (Formaldehyde, methanal), CO (Carbon Monoxide) and NH_3 (Ammonia), taking one measurement per microchip. *[CMS is a*

subsystem of the Russian SKDS Pressure Control & Atmosphere Monitoring System.]

Kononenko conducted the periodic checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the passageways PrK (SM Transfer Compartment)–ATV, PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1.

Oleg also took the periodic readings of potentially harmful atmospheric contaminants with the CMS (Countermeasure System) component of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite which uses preprogrammed microchips to measure H_2CO (Formaldehyde, methanal), CO (Carbon Monoxide) and NH_3 (Ammonia), taking one measurement per microchip. *[CMS is a subsystem of the Russian SKDS Pressure Control & Atmosphere Monitoring System.]*

Later, the FE-1 used the SOGS GANK-4M system for taking and recording atmospheric readings. *[GANK tests for Methane (CH_4), NH_3, CO, H_2CO, Nitrogen Oxides (NO, NO_2), Hydrogen Chloride (HCl), Hydrogen Fluoride (HF), and Hydrogen Cyanide (HCN).]*

The Elektron was activated this morning and is currently performing nominally. An O_2 repress from Progress was also conducted to supplement the Elektron due to the ppO_2 level approaching lower flight rule levels.

A scheduled leak check of the Node 2 to JPM vestibule was initiated this morning. The vestibule has been partially evacuated (to 325 mmHg) and the check will continue for eight hours. In preparation for the check which isolates the JPM, all of the laptops therein were turned off due to the power to those units being disabled.

Working on the SHERE experiment payload, Chamitoff performed a SHERE Fluid Module Insert.

Kononenko performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Afterwards, Oleg performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations,

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The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2, FE1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Oleg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure
on the HRM storage medium (done six times a week).

TVIS Noise Update: The TVIS treadmill has not been used for exercise since the crew reported hearing unusual noises yesterday. Audio, video, and still imagery were taken by the crew and downlinked for ground team analysis. The PFE w/OUM (Periodic Fitness Evaluation with Oxygen Uptake Measurement) activities are being deferred from tomorrow to accommodate an inspection of the TVIS chassis. Analysis of the increasing noise of the treadmill led to a requirement last evening to stand down on TVIS operations until further inspections of the unit could be conducted. The engineering team has speculated that the noise could be the result of a belt slat making contact with the chassis or another slat. This conclusion is based on the frequency (twice per belt revolution) and increasing magnitude of a percussive noise with increasing speeds. Recommendations on a forward plan are being developed.

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/30/08
Date:	Wednesday, July 30, 2008 8:50:30 PM
Attachments:	

ISS On-Orbit Status 07/30/08

All ISS systems continue to function nominally, except those noted previously or below.

Upon wake-up, Oleg Kononenko terminated his seventh MBI-12 SONOKARD experiment session for the long-term Russian sleep study, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. Sergey Volkov's new MBI-12 session starts tonight (~5:20pm). *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

CDR Volkov began his workday again by supporting the Russian TEKh-20 Plazmennyi-Kristall/PK-3+ (Plasma Crystal-3+) experiment on its final day, first activating the turbopump in the Service Module (SM)'s Transfer Compartment (PkhO) for keeping the vacuum chamber (ZB) in the SM Work Compartment (RO) evacuated, then starting the experiment, terminating it later and performing close-down ops. Sergey copied the data to USB stick for subsequent downlinking via OCA, deactivated all the hardware, and disassembled and stowed it. *[Main objective of PK-3 is to study non-linear dust plasma wave propagation and dispersion ratio at a specified power of an alternating electric field, pressure, and a varied number of particles, controlled by the experimenter. The research experiment was performed in semi-automatic mode with particles having a diameter of 9.19 µm under pressures of 20, 40, and 80 Pa (Pascal).]*

FE-1 Kononenko performed more FGB outfitting with new stowage enclosures

delivered by the ATV, built in Russia to provide more efficient stowage spaces behind FGB panels and improve airflow/circulation. *[Today's installations involved the spaces behind panel 409 (from which the B14M unit was removed first) in zone 35G, and two panels (424, 425) in zones 10 & 12.]*

The FE-1 also supported the ground's activation of the Elektron O_2 generator at 32 amps by monitoring the external temperature of its secondary purification unit (BD) for the first 10 minutes of operations to ensure that there is no overheating. In support of the reactivation, at ~4:42am EDT the ground temporarily switched the ATV (Automated Transfer Vehicle) to autonomous power (i.e., disconnected from ISS) and later reconfigured it to ISS power. *[During nominal Elektron operations a gas analyzer is utilized to detect hydrogen (H_2) in the O_2 line (which could cause overheating) but is not included in the control algorithm until 10 minutes after Elektron startup.]*

In the JAXA Kibo JPM (JEM Pressurized Module), FE-2 Chamitoff continued preparations for payload operation, today continuing reconfiguring/reconnecting the CB (Clean Bench) subrack facility.

Chamitoff later set up the payload equipment for his third session with the 3D-Space (Mental Representation of Spatial Cues During Space Flight) experiment and then performed the protocol, with all three exercises (distance, illusion, handwriting). After all data were stored on PCMCIA memory card, the ESA multipurpose laptop was shut down and the hardware disconnected & stowed away. *[3D-SPACE, a collaboration of ESA and the French space agency CNES (Centre National de la Recherche Scientifique), is designed to identify accurate visual perception & localization of objects in the space environment as prerequisites for spatial orientation & reliable performance of motor tasks in microgravity. Humans have mental representations of their surroundings based on sensory information & experience. It is hypothesized that depth & distance perception of objects could be altered in space due to the absence of gravitational reference and ambiguous perspective cues. 3D-SPACE investigates (a) depth perception & the role of perspective cues using geometric illusions, (b) distance perception using both standard psychophysics tests & natural three-dimensional scenes presented on a virtual reality head-mounted display, and (c) the effects of cognitive vs. perceptual-motor changes using handwriting & drawing tests.]*

The CDR performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS *replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Afterwards, Sergey also conducted the daily IMS (Inventory Management System)

maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

CDR Volkov set up the hose & electric pump assembly and initiated (later closed out) transfer of water from the ATV WDS (Automated Transfer Vehicle/Water Delivery System) tank #1to three EDV containers in the SM.

In the JAXA Kibo JPM (JEM Pressurized Module), Gregory Chamitoff removed temporary stowage from the Ryutai rack and installed a silicone filter. *[RYUTAI (“fluid”) is a Japanese multipurpose experiment/payload rack system to support the FPEF (Fluid Physics Experiment Facility), SCOF (Solution Crystallization Observation Facility), PCRF (Protein Crystallization Research Facility) and the IPU (Image Processing Unit) by providing structural interfaces, power, data, cooling, water and other items needed to operate science experiments in micro-G.]*

FE-1 Kononenko used the Russian MedOps SZM-MO-21 “Ecosfera” air sampler & incubation equipment for another check on the station’s sanitary-hygiene status, conducting the standard 45-min. microbial analysis (T+7 days) on the air samples collected on 7/23 and incubated since then in the MO-21 equipment in Medium 2 (MON-2). *[MO-21 determines microbial contamination of the ISS atmosphere, specifically the total bacterial and fungal microflora counts and microflora composition according to morphologic criteria of microorganism colonies.]*

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Oleg transferred the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~5:20pm, getting ready for sleep time, the CDR again set up the Russian MBI-12 SONOKARD (Sonocard) payload and started his seventh experiment session, using a sports shirt from the SONOKARD kit with a special device in the pocket for testing a new method for acquiring physiological data without using direct contact on the skin. Measurements are recorded on a data card for return to Earth.

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/29/08 -- **NASA 50 Years** (Pres. Eisenhower signs)
08/13/08 -- ATV Reboost
08/30/08 -- Progress M-64/29P undocking, from FGB nadir

09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
03/25/09 -- Soyuz TMA-14/18S launch
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May ’09)**
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/29/08
Date:	Wednesday, July 30, 2008 11:00:38 AM
Attachments:	

ISS On-Orbit Status 07/29/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Volkov began his workday again by attending to the current experiment session with the Russian/German TEKh-20 Plasma Crystal-3+ (Plazmennyi-Kristall/ PK-3+) payload, activating the turbopump in the Service Module (SM)'s Transfer Compartment (PkhO) for keeping the vacuum chamber (ZB) in the SM Work Compartment (RO) evacuated. The turbopump will be deactivated again tonight at ~5:25pm EDT before sleeptime. *[The research experiment is being performed with particles having a diameter of 9.19 µm under pressures of 20, 40, and 80 Pa (Pascal). The primary objective of the experiment is to study the behavior of structures when exposed to a low-frequency alternating electrical field of varying amplitudes as produced by an RF generator at various power output settings. The experiment is being performed in semi-automatic mode.]*

FE-1 Kononenko configured gas transfer and initiated (later terminated) an oxygen refreshing of the cabin atmosphere with the remaining O_2 supplies in the ATV1 cargo carrier "Jules Verne".

Sergey serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out"-to-vacuum cycle on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~3:45pm EDT. Filter bed #1 was regenerated yesterday. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time done: 7/16&17).]*

In the JAXA Kibo JPM (JEM Pressurized Module), FE-2 Chamitoff continued preparations for payload operation, today removing the Mach-Zehnder covers of the SCOF (Solution Crystallization Observation Facility) and reconfigured/reconnected

the CB (Clean Bench) subrack facility from its launch configuration.

Volkov, Kononenko & Chamitoff spent three hours in the TMA-12 Descent Module (SA) to conduct the Soyuz descent drill, a standard training exercise for every crew returning on a Soyuz. The exercise, which strictly forbids any command activation (except for switching the InPU display), was supported by a tagup and discussions with ground instructor at TsUP/Moscow via S-band. *[The session includes a review of the pertinent ODFs (operational data files), specifically the books on Soyuz Ascent & Descent Procedures, Emergency Descents, and Off-Nominal Situations, crew responsibilities when executing the flight program, visual crew recognition of SUS (Entry Control System) failures, spacesuit procedures, etc., with special emphasis on operations with the Neptune-ME cockpit console. The training uses a Descent Simulator application on the RSK1 laptop. During the actual descent, Volkov, as Soyuz CDR, will occupy the middle couch, with SFP (Spaceflight Participant) Garriott in the right seat and Kononenko in the Descent Module's left Kazbek couch.]*

As part of regular preventive maintenance of RS ventilation systems, Oleg applied vacuum cleaner and soft brush to cleaning the detachable VT7 fan screens 1, 2 & 3 of the three SOTR (Thermal Control System) gas-liquid heat exchangers (GZhT4) In the FGB (Funktsionalnyi-Grusovoi Blok).

The FE-1 also conducted the periodic (about twice a month) replenishing of the Elektron oxygen generator's water supply for electrolysis, filling the KOV EDV container with water collected in a CWC (Contingency Water Container) from the Lab CCAA (Common Cabin Air Assembly) dehumidifier. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron shutdown.]*

Kononenko performed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Afterwards, Oleg performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise

device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Oleg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~5:20pm EDT, just before sleep time, the FE-1 will again set up the Russian MBI-12 SONOKARD (Sonocard) payload and start his seventh experiment session, using a sports shirt from the SONOKARD kit with a special device in the pocket for testing a new method for acquiring physiological data without using direct contact on the skin. Measurements are recorded on a data card for return to Earth. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

OGS Update: The U.S. Oxygen Generation System is being activated periodically until the next planned processing of water by the system. The overall goal of this activity is to maintain pressure in the feedwater line below the maximum allowable pressure between activations. This will be accomplished by periodically powering the rack to monitor the rack temperature and feedwater pressure and then reopening the valve as needed to relieve pressure.

E17/E18 Handover Conference Update: Yesterday's "handover" conference was between the current ISS crew and the upcoming CDR (and ISS veteran) Mike Fink.

CEO (Crew Earth Observations) photo targets uplinked for today were **Yellow River Delta** *(this complex and dynamic delta is formed by one of central China's major rivers. Extensive land use changes and flood-control measures along its course have had significant impact on both the shape and location of the main river channel. The crew had a nadir pass over this feature in late afternoon. Although tropical storm Fung-wong is expected to be breaking up over interior SE China, partly cloudy to fair weather conditions were expected in the delta region. As ISS approached from the SW, Greg was to try for a mapping strip along the main channel of the river),* **Mt. Kilimanjaro, Kenya** *(this famous peak, at 19,340 feet, is Africa's highest mountain and is located in northeastern Tanzania near the border with Kenya. Researchers are monitoring the tiny ice fields near the summit that have noticeably diminished during the twentieth century. On this early afternoon pass Gregory was to look for this volcanic peak just right of track. There may have been low clouds in the surrounding plains as ISS approached the area from the*

SW), and **Amazonian Fans, Brazil** *(this has proven to be a very challenging target to acquire by ISS crews. Clouds usually obscure this area to the south of the Amazon for most of the year. Also the inland delta features CEO workers are attempting to detect and document here are very subtle due to vegetation cover and low topographic relief. The early afternoon ISS pass today should have had unusually few clouds, and researchers are seeking a nadir to just left of track mapping strip with the low-lens settings as the station moves from SW to NE across the region. It was hoped that these images can be used to help detect and pinpoint areas for more detailed images in the future. JSC geologists are investigating inland deltas worldwide as analogs for similar features on Mars).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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07/29/08 -- **NASA 50 Years** (Pres. Eisenhower signs)
08/13/08 -- ATV Reboost
08/30/08 -- Progress M-64/29P undocking, from FGB nadir
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years** (official)
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
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11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
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07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
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12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola

02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/28/08
Date:	Monday, July 28, 2008 5:57:37 PM
Attachments:	

ISS On-Orbit Status 07/28/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 15 of Increment 17.*

******* Happy 50th Birthday, NASA!*******

CDR Volkov began his workday again by attending to the current experiment session with the Russian/German TEKh-20 Plasma Crystal-3+ (Plazmennyi-Kristall/ PK-3+) payload, activating the turbopump in the Service Module (SM)'s Transfer Compartment (PkhO) for keeping the vacuum chamber (ZB) in the SM Work Compartment (RO) evacuated. The turbopump will be deactivated again tonight at ~5:25pm EDT before sleeptime. *[Main objective of PK-3 is to study dust plasma wave propagation and dispersion ratio at a specified power of HF discharge, pressure, and a varied number of particles.]*

The CDR also performed the periodic service of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The process will be terminated around sleeptime, at ~4:25pm EDT. Bed #2 regeneration follows tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any traces of leaked Freon-218 from the cabin atmosphere (last time: 7/22&23).]*

FE-1 Kononenko performed more FGB outfitting with new stowage enclosures delivered by the ATV, built in Russia to provide new efficient stowage spaces behind FGB panels and improve airflow/circulation. *[Today's installations involved the spaces behind two panels (404, 405) in FGB zone 5, 8 & 9.]*

Conducting more preparations for initiating payload operations in the JAXA Kibo

JPM (JEM Pressurized Module), FE-2 Chamitoff verified the nominal performance of the ISPR (International Standard Payload Rack) power switch, using the SLT (Systems Laptop). Later, Greg collected the necessary parts for the reconnection of the CB (Clean Bench) subrack facility.

Also in the Kibo JPM, Gregory activated the PLT (Payload Laptop) for payload operation (after temporarily disconnecting the SSC-14/Station Support Computer 14 power cable to allow UOP/Utility Outlet Panel access), then turned off the PLT, relocated it for payload ops and powered it up again.

Afterwards, continuing FSL (Fluid Science Laboratory) commissioning in the COL (Columbus Orbital Laboratory), Chamitoff reconfigured the FSL by removing the OPT TGT (Optical Target) and inserting the GEOFLOW EC (Experiment Container), followed by unlocking and releasing the FSL FCE (Facility Core Element), setting up the FSL, and deactivating the PLT. *[The installation involved the demating of ECP Video By-Pass Connector from the EC's Panel Video P301. After some initial tests, the GEOFLOW science program is planned to start tomorrow.]*

Sergey Volkov worked on the Service Module (SM) toilet systems (ASU), performing the monthly 30-min. maintenance/servicing of the facility, changing out replaceable ASU parts with new components, i.e., the urine receptacle (MP) and a filter insert (F-V). The old parts were discarded as trash.

After the FE-2 broke out the auditory test equipment, the three crewmembers took the periodic O-OHA (on-orbit hearing assessment) test, a 30-min. NASA environmental health systems examination to assess the efficacy of acoustic countermeasures, using a special MEC (Medical Equipment Computer) laptop application. It was Greg's second O-OHA session, the third for Sergey & Oleg. *[The O-OHA audiography test involves minimum audibility measurements for each ear over a wide range of frequencies (0.25-10 kHz) and sound pressure levels, with the crewmembers using individual-specific Prophonics earphones, Bose ANC headsets and the SLM (sound level meter). To conduct the testing, the experimenter is supported by special EarQ software on the MEC, featuring an up/down-arrow-operated slider for each test frequency that the crewmember moves to the lowest sound pressure level at which the tone can still be heard. The baseline test is required not later than about Flight Day 14 for each new Expedition and is then generally performed once per month. Note: There have been temporary hearing deficits documented on some U.S. and Russian crewmembers, all of which recovered to pre-mission levels.]*

Working from the Russian RSE1 laptop, CDR Volkov loaded (ghosted) the RSK-1 laptop with upgrade software (Vers. 1.4) from a DVD via an HDD (Hard Disk Drive)

“image”.

In the Lab, Chamitoff performed maintenance on the CGBA (Commercial Generic Bioprocessing Apparatus) after its use for SHERE session on last weekend’s VolSci (Voluntary Science) program, removing the CGBA-5 mufflers to clean the air inlet screens and then accessing and rotating the Silicate Garden Hab. CGBA-5 will be activated from the ground later this week.

The CDR continued the current round of the monthly preventive maintenance of RS (Russian Segment) ventilation systems in the *Funktsionalnyi-Grusovoi Blok* (FGB), cleaning the detachable fan screens 1, 2, and 3 of the three SOTR gas-liquid heat exchangers (GZhT4) and the fixed grill of GZhT #4.

Kononenko meanwhile had ~20 min set aside for reviewing an OBT (Onboard Training) for OpsLAN (Operations Local Area Network) reload procedures.

The FE-1 completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Oleg also performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The FE-2 completed the periodic (monthly) inspection of the RED (Resistive Exercise Device) canister cords and accessories.

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Sergey transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~1:05pm EDT, the Expedition 17 crew held their first “handover” conference with the E-18 crew, via S-band (audio).

As a discretionary job from the Russian “time permitting” task list, Oleg was perform

the regular monitoring, picture-taking and downloading for the BIO-5 Rasteniya-3 ("Plants-3") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

SKV-2 Update: The Russian SKV-2 air conditioner was successfully recharged with fresh Khladon (Freon-218) coolant yesterday and is currently operating nominally, collecting the first condensate. TsUP-Moscow estimates that about 100 grams of Khladon leaked out during the recharge process. The BMP Micropurification Unit will be activated every 5 days for increased scrubbing of the cabin atmosphere (along with the previously reported Khladon spill).

Elektron Update: The Elektron oxygen generator was shut down over the last weekend due to a procedural error which introduced non-certified water into the Elektron water container. The unit was purged with nitrogen during the shutdown sequence as usual. It is scheduled to be re-activated on 7/30. An O_2 repress from ATV storage will be conducted tomorrow to maintain proper ppO_2 levels.

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04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/27/08
Date:	Monday, July 28, 2008 3:34:30 AM
Attachments:	

ISS On-Orbit Status 07/27/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – rest day for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff. Ahead: Week 15 of Increment 17.*

Sergey Volkov began his workday again by attending to the current experiment session with the Russian/German TEKh-20 Plasma Crystal-3+ (Plazmennyi-Kristall/ PK-3+) payload, activating the turbopump in the Service Module (SM)'s Transfer Compartment (PkhO) for keeping the vacuum chamber (ZB) in the SM Work Compartment (RO) evacuated. The turbopump will be deactivated again tonight at ~5:25pm EDT before sleeptime. *[Main objective of PK-3 is to study dust plasma wave propagation and dispersion ratio at a specified power of HF discharge, pressure, and a varied number of particles.]*

In the SM, Gregory Chamitoff set up the video equipment and opened the TVIS (Treadmill with Vibration Isolation & Stabilization) skirt for filming his subsequent workout on the for biomechanical evaluation of his performance and assessment of the hardware status by ground engineers. [*At the beginning of the day, Greg set up the camcorder, and all crewmembers recorded their TVIS exercise sessions. After the exercise sessions are complete, Greg recorded the videos to the VTRs (video tape recorders). Once the recording to the VTRs was complete, the ground began the restricted video downlink to the ground around the Ku availability. Greg then stowed the camcorder.]*

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

At ~10:30am, the FE-2 had his weekly PFC (Private Family Conference) via S-band/ audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground

video on an SSC laptop).

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this “Gateway” website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
08/30/08 -- Progress M-64/29P undocking, from FGB nadir
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
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04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/26/08
Date:	Saturday, July 26, 2008 10:05:20 PM
Attachments:	

ISS On-Orbit Status 07/26/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – mostly off duty for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff.*

Sergey Volkov began his workday by attending to the current experiment session with the Russian/German TEKh-20 Plasma Crystal-3+ (Plazmennyi-Kristall/PK-3+) payload, activating the turbopump in the Service Module (SM)'s Transfer Compartment (PkhO) for keeping the vacuum chamber (ZB) in the SM Work Compartment (RO) evacuated. The turbopump will be deactivated again tonight at ~5:25pm EDT before sleeptime. *[Main objective of PK-3 is to study dust plasma wave propagation and dispersion ratio at a specified power of HF discharge, pressure, and a varied number of particles.]*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the SM dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

As part of the house cleaning, the crew also conducted regular maintenance inspection & cleaning on fan grilles in the FGB (TsV2), SM (VPkhO, VPrK, FS5, FS6 & FS9), DC1 (V3) screens and PF1/PF2 dust filters, as well as in the COL (Columbus Orbital Laboratory).

Gregory filled out the regular FFQ (Food Frequency Questionnaire), his sixth, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software.*

Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]

At ~9:45am EDT, the crewmembers conducted their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

Conducting his VolSci voluntary weekend science program, the FE-2 set up for several hours of a SHERE (Shear History Extension Rheology Experiment) session with the CGBA (Commercial Generic Bioprocessing Apparatus) activating the MSG (Microgravity Science Glovebox) with its A31p laptop, powered on the SHERE payload in the CGBA, unstowing Fluid Module #30 and performed a dry run, followed by CGBA power down, data transfer and deactivation of SHERE and the MSG via the A31p.

Afterwards, Gregory took measurements for the regular atmospheric status check for $ppCO_2$ (Carbon Dioxide partial pressure) in the Lab, SM (at panel 449) and COL (Columbus Orbital Laboratory), using the hand-held CDMK (CO_2 Monitoring Kit, #1002). *[The CDMK was then deactivated and returned to its stowage location at LA B1S2.]*

Oleg completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Greg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

The two cosmonauts had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Sergey at ~8:20am, Oleg at ~10:20am.

Weekly Science Update *(Expedition Seventeen -- Week 14)*

3-D SPACE: Third session for Greg Chamitoff is currently planned for 7/30.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Measurements continue in the FGB module. Last memory card exchange was performed on 7/1. Next activities are planned on 7/22 for the rotation of the ALTEINO instrument and the exchange of the memory card. Subsequent data downlink is currently planned on 7/23.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): The Silicate Garden Hab S/N2 ground unit was activated at approximately 5:15pm EDT on 7/11. The flight unit was activated at approximately 1:25pm on 7/14 via remote command. There are 2 cameras in the flight unit imaging 2 chambers each for a total of 4 chambers on Side 1. Fibers continue to grow from the crystals in strange formations in the flight unit.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): On 7/16, EuTEF encountered a MIL-Bus error (this happened similarly in the past). The platform has to be power-cycled and the entire EuTEF facility re-initiated. On 7/20, a similar DHPU (Data Handling Processing Unit) problem was encountered again. Although this problem does not prevent EuTEF to function, ground teams are working hard to characterize it and find a solution. A DHPU software patch is currently being developed to fix the link error issues encountered with DEBIE-2 and FIPEX instruments. -- DEBIE-2: Instrument could not be restarted immediately after the DHPU problem on 7/20, and was finally re-activated on 7/22) for a short diagnostic run. EBIE-2 was stopped on 7/23 to allow science acquisition with FIPEX. Generic status: link error still in work. However, a work-around allows for regular science data acquisition using an on-board Instrument Operations Procedure (IOP), but not yet in conjunction with any FIPEX IOP – a final software patch, which will enhance the present instrument capabilities, is under finalization on ground;-- DOSTEL: On-going science acquisition;-- EuTEMP: Currently inactive as planned;-- EVC: Inactive this week;-- EXPOSE: On-going science acquisition;-- FIPEX: Instrument re-activated after DHPU problem on 7/20. Science acquisition since 7/23;-- MEDET: Instrument is not active due to low temperature; -- PLEGPAY: Currently in READY mode, no science data acquisition on-going;-- TRIBOLAB: The instrument is currently in Stand-By Mode. The Ball-Bearing experiment would be restarted towards mid-Aug. Analysis is on-going on ground.

FSL (Fluid Science Laboratory): FSL is back and running. Further FSL commissioning activities remain to be done (see following item).

GEOFLOW: On 7/23, Greg swapped the FSL optical targets, and the Optical check-out 2 has been successfully performed from ground before the ATV reboost. At this point, everything looks ready to remove this optical target and to insert the GEOFLOW Experiment Container on 7/28. After some initial tests, the GEOFLOW science program is planned to start on 7/29.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Planned.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer, ESA): In progress.

NUTRITION w/REPOSITORY: In progress.

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): The SHERE team thanks Greg for selecting SHERE for Voluntary Science checkout activities performed on GMT 202. The checkout tests were a great success and showed that the SHERE hardware is functioning properly. The SHERE team looks forward to working with Greg again tomorrow, GMT 208, to perform the SHERE Dry Run. The recent fit problem with the Fluid Module Stowage Tray is being worked and will not affect the Dry Run.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): The HRP team thanks Greg for completing his first week of Sleep logs and his Actiwatch download initialization session. HRP is currently targeting the week of 8/4 for Greg’s next week of Sleep logging and the week of 8/11 for his next Actiwatch download. Additional Sleep logging on non-targeted weeks is above and beyond and greatly appreciated by the PI.

SOLAR (Solar Monitoring Observatory): After a successful troubleshooting activity

by Greg on 7/21 (GMT203) and subsequent downlink of the log file generated during the boot sequence of SOLAR, ground teams have been very busy analyzing this new input with some very good news: the SOLAR LAN interface has been confirmed to be fully nominal. Next troubleshooting step was to focus on the Columbus LAN Switch#2 (CLSW#2), and on 7/23 (GMT205), ground activities were performed. SOLAR power feeder #1 was re-activated immediately and was forced to communicate via the other Columbus LAN switch (CLSW#1). Immediately, SOLAR started to re-send telemetry to the ground. Full functionality of the platform has been recovered. The instruments have been progressively warming up, thanks to continuous power via feeder #1 after this harsh beta angle period. The next Sun observation window starts on 7/31.-- SOVIM: Instrument confirmed fully functional; awaiting the Sun; -- SOLSPEC: Instrument confirmed fully functional; awaiting the Sun;-- SOLACES: Instrument confirmed fully functional; awaiting the Sun.

SOLO: Planned.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): The four ECs (Experiment Containers) of Rotor B are yet to be retrieved by the crew from the blocked Rotor B. BIOLAB could not be activated from ground yet, pending resolution of the Smoke Detector issue. A troubleshooting plan has been developed to recover all the BIOLAB functionalities. The first step is to exchange an ESEM Power Board, in which this activity is planned later on today, i.e. 7/25. Hopefully, this will resolve the Smoke Detector issue and the ground will proceed with the next steps; starting with the BIOLAB activation from ground on 7/26. The remaining WAICO-#1 ECs will be disposed and replaced by 6 Reference ECs on Rotor B. The remaining WAICO-#1 ECs will be disposed and replaced by six Reference ECs on Rotor B.

CEO (Crew Earth Observations): Through 7/15 the ground has received a total of 3,391 frames of CEO images for review and cataloging. New imagery received this week with times corresponding to CEO target request times included: Lake Poopo, Bolivia (interesting new imagery of the target is now under review); Jarvis Island, equatorial Pacific (only a solitary, late-shot frame of this isolated island); and Moorea Coral Reef, Tahiti (good imagery acquired, a bit late-oblique, and a touch

soft). "As you are aware CEO target opportunities have been limited by low light and winter weather. It will take good fortune to spot even a large, bright iceberg under those conditions. We hope you may have better luck with the Polar Mesospheric Cloud opportunities. This lull is allowing us to work through our backlog. You shot excellent imagery of: Mount Rainer in with snow, the Red River Valley, the Tigris-Euphrates Delta, and much of the Afar Rift Zone target. Good work! We suggest technique-wise that you continue to practice with the long lens settings to improve consistency of focus, and continue to practice providing an overlap between successive images when mapping a feature or a regional target. The composition and quality of your images is high and we do appreciate you all your efforts."

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/25/08
Date:	Friday, July 25, 2008 8:11:00 PM
Attachments:	

ISS On-Orbit Status 07/25/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Sergey Volkov continued preparations for operating the Russian/German TEKh-20 Plasma Crystal-3 Plus (PK-3+) experiment payload, the first time for Expedition 17. *[After unstowing and setting up the hardware yesterday in the* Service Module (SM)*, leak checking of the electronics box and evacuation of the vacuum work chamber (ZB) in the SM Work Compartment (RO) with the turbopump, Volkov today conducted more hardware testing and calibration, uploaded new software from a USB stick, checked out the software installation and verified the readiness of the experiment. After starting the turbo pump right after wake-up and conducting additional leak checking on the ZB during the "day", the CDR will deactivate the turbopump tonight at ~5:25pm EDT. The resulting log file was then downloaded to laptop for downlink via BSR-TM. The experiment is performed on plasma, i.e., fine particles charged and excited by HF (high frequency) radio power inside the evacuated work chamber. Main objective is to obtain a homogeneous plasma dust cloud at various pressures and particle quantities with or without superimposition of an LF (low frequency) harmonic electrical field. The experiment is conducted in automated mode. PK-3+ has more advanced hardware and software than the previously used Russian PKE-Nefedov payload.]*

FE-2 Gregory Chamitoff supported OGS (Oxygen Generator System) activities, deactivating the OGS WDS (Water Delivery System) and then turning off the OGS for reconfiguring it for the subsequent purging of the H_2 (hydrogen) sensor.

Using the Russian MO-21 "Ecosfera" air sampler & incubation equipment, FE-1 Oleg Kononenko monitored the station's sanitary-hygiene status by conducting another 40-min. microbial analysis (T+2 days) on the air samples collected on 7/23,

including from the ATV (Automated Transfer Vehicle), and incubated since then in the MO-21 equipment. *[MO-21 determines microbial contamination of the ISS atmosphere, specifically the total bacterial and fungal microflora counts and microflora composition according to morphologic criteria of microorganism colonies. The equipment, consisting of an air sampler set, a charger and power supply unit, provides samples to help determine microbial contamination of the ISS atmosphere, specifically the total bacterial and fungal microflora counts and microflora composition according to morphologic criteria of microorganism colonies.]*

Volkov spent a few minutes on the weekly inspection of the TVIS treadmill roller bearings, checking the treadmill's belt both left and right for any noticeable depressions due to seized or worn rollers. *[With the TVIS treadmill rollers approaching their end-of-life, the frequency of their inspection has recently been increased for safety.]*

Kononenko performed more FGB outfitting with new stowage enclosures delivered by the ATV, built in Russia to provide more efficient stowage spaces behind FGB panels and improve airflow/circulation. *[Today's installations involved the spaces behind two panels (114, 115) in FGB zone 36 and behind one panel (215) in zone 40B.]*

The crew performed the mandatory two-hour OBT (onboard training) emergency egress drill for the case of rapid cabin depressurization, with Russian & US specialists standing by at both control centers for crew questions or comments. *[Background: Purpose of the drill is to (a) familiarize the station residents with the location of hardware and the positions of valves used in emergency situations, (b) work through the Russian Segment (RS) hardware deactivation procedures, (c) review ATV emergency response material, (d) practice crew emergency joint activities, and (e) identify crew comments and suggestions that arise during training regarding crew procedures and equipment. In the RS, the crew translated along the emergency egress path to the DC1 Docking Compartment (where Soyuz TMA-12 is currently docked), checking hardware such as the Sokol suits, cable cutters, fire extinguisher (OKR), gas masks (IPK), emergency procedures books, valve settings, hatch rubber seal & restraint integrity, etc. In the US Segment (USOS) the inspection focused on fireports being unblocked in the Lab {21}, with other US modules to be checked by future crews), readiness of CSA-CP (Compound Specific Analyzer-Combustion Products), ISS leak kit, PBA (portable breathing assembly) and PFE (portable fire extinguisher), emergency procedures books, valve settings, integrity of hatch rubber seals, presence of hatch handrails, etc. The checks also included Node-2, COL (Columbus Orbital Laboratory), JLP (Japanese Experiment Module Experiment Logistics Module Pressurized Section) and Kibo JPM (JEM Pressurized Module). The exercise was topped off by a thorough debrief with the ground via S-band. During the session, the crew simulated executing the planned*

emergency procedures while moving about the station. For the case of an onboard fire and for emergency descent, there are other mandatory emergency drill OBTs.]

The CDR completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Sergey also performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Later, Volkov began a new round of periodic preventive maintenance of cabin ventilation systems in the RS (Russian Segment), today cleaning the "Group A" fan grilles in the SM.

Continuing his work on the OpsLAN (Operations Local Area Network) software reload, Greg Chamitoff –

- Stowed the equipment used for the reload,
- Activated the Netgear WAPs (Wireless Access Points) which provide Ethernet connectivity for the JSL (Joint Station LAN), then
- Performed the reload on the PDAs, setting up their RF (radio frequency) connection and
- Prepared the BCR (Bar Code Reader),
- Activated the SSC-14 (Station Support Computer 14),
- Set up its wireless connection and
- Disconnected its drag-thru Ethernet cable to the Node-2 patch panel & the ISL (Integrated Station OpsLAN) Router for stowage.

The FE-2 also took water samples from the SRV-K outlet for return on Mission ULF-2 and analysis on the ground.

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-1, FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (CDR). Later, Sergey transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~4:20am, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU/*Glavnaya operativnaya gruppa upravleniya* = *"Main Operative Control Group"*), including Shift Flight Director (SRP), at TsUP-Moscow via S-band/audio, phone-patched from Houston and Moscow.

At ~10:55am, Sergey & Oleg linked up with TsUP stowage specialists via S-band to conduct the weekly IMS tagup, discussing stowage issues, equipment locations and ATV & Progress cargo transfers.

At ~4:35pm, the ISS crew is scheduled for their regular weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC (Station Support Computer)]*.

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10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/24/08
Date:	Thursday, July 24, 2008 3:51:13 PM
Attachments:	

ISS On-Orbit Status 07/24/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Volkov made preparations for a run of the Russian/German TEKh-20 Plasma Crystal-3 Plus (PK-3+) experiment payload, the first of Expedition 17, by unstowing the hardware, installing it in the SM for operation and photographing the setup. The images were downlinked to TsUP via BSR-TM for inspection, and the CDR performed the initial leak check of the PK-3 Electronics Box before its evacuation. More work to come tomorrow. *[The experiment is performed on plasma, i.e., fine particles charged and excited by HF (high frequency) radio power inside a vacuum work chamber. Main objective is to obtain a homogeneous plasma dust cloud at various pressures and particle quantities with or without superimposition of an LF (low frequency) harmonic electrical field. The experiment is conducted in automated mode. PK-3+ has more advanced hardware and software than the previously used Russian PKE-Nefedov payload.]*

FE-1 Kononenko took and dumped the periodic sensor readings of the Russian "Pille-MKS" (MKS = ISS) radiation dosimetry experiment which has ten sensors placed at various locations in the Russian segment (DC1, SM starboard & port cabin windows, ASU toilet facility, control panel, etc.). *[Nine of the ten dosimeters are read manually.]*

Volkov performed IFM (in-flight maintenance) on the Russian segment (RS)'s electrical power system (SZP), removing and replacing the #7 unit of the eight 800A batteries in the Service Module (SM).

The CDR also conducted the monthly FDS PEP (Fire Detection & Suppression/ Portable Emergency Provisions) safety inspection/audit in the ISS modules. *[The IMS-supported inspection involves verification that PFEs (Portable Fire Extinguishers), PBAs (Portable Breathing Apparatus), QDMAs (Quick-Don Mask*

Assemblies) and EHTKs (Extension Hose/Tee Kits) are free of damage to ensure their functionality, and to track shelf life/life cycles on the hardware.]

In the SM, Kononenko initiated the new Russian BIO-5 Rasteniya-3 ("Plants-3") experiment, replacing the root module with a new one from stowage, filling the KDV water canister, loading new software and running a hardware test, then starting the experiment. *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). The payload hardware includes a module (MIS/ Module for the Investigation of Substrates), a MIS control unit (BU), a nitrogen purge unit (BPA) and other accessories. During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording.]*

FE-2 Chamitoff conducted the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week. The current card (17-0002R) lists 35 CWCs (Contingency Water Containers,~1401.8 L total) for the four types of water identified on board: technical water (650.6 L, for Elektron, flushing, hygiene, incl. 509.4 L non-usable water because of* Wautersia *bacteria), potable water (706.7 L, incl. 260.6 L currently on hold), condensate water (41.5 L), waste/EMU dump and other (7.9 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

The FE-2 also continued the OpsLAN (Operations Local Area Network) reload. *[Today's work included reloading SSCs (Station Support Computers) 12-15, followed by swapping hard drives on SSC 1-11, running a laptop configuration tool on every SSC Client, and loading DVDs in SSCs 4 & 8. The ground then is to take over to wrap up the activities overnight, finishing with configuring each of the clients to work on the Ops LAN, configuring the IP Communicator on each SSC, and running the KFx file transfer application on two of the SSCs so OCA can uplink execute packages. The OpsLAN updates by the ground included the OpsLAN home pages, Expedition 17 Mission load, and Ops Notes. Also, Service Pack 01 was uplinked for the SSC File Server.]*

Continuing the current round of periodic preventive maintenance of RS (Russian Segment) ventilation systems, Sergey worked in the DC1 (Docking Compartment), replacing the PF1,2 filter cartridges and cleaning the V1 & V2 fan grilles and VD1 & VD2 air ducts.

Kononenko & Volkov had ~1.5 hrs set aside for recharging the Russian SKV-2 air

conditioner with Khladon (Freon-218) coolant from a KVO 6003 bottle delivered on Progress 29P. *[SKV-2 was deactivated last April after a small Khladon spill on 4/24 during maintenance activity.],*

The CDR completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Working from the Russian discretionary "time permitting" task list, Oleg performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

At ~2:50m, Chamitoff is scheduled to power up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, & power supply) and to conduct, at 2:55pm, a ham radio exchange with the European Space Camp 2008 at the Zanka Children & Youth Centre, near Lake Balaton, Zanka, Hungary. *[The radio contact is made from ESA's Space Camp in Hungary. 120 children of ESA staff members from various European countries, between 8 and 17, interested in science and sports are participating. This year they're learning about Earth Observation. Helped by Hungarian radio amateurs, they would like to know more about astronauts' lives. Questions were uplinked beforehand. "What kind of earth observation experiments do you do from the space station?", "What is the most beautiful or interesting thing that you have seen looking down at Earth?", "Does weightlessness make you feel sick or ill?", "I read you are a diver. How does diving compare to weightlessness in space?", "How do you feel sleeping in the ISS? In which part of the station do you sleep? Do you have a separate cabin for sleeping?", "Do you see the stars through the windows? Do they look different than from Earth?", "How often do you have to do a cleaning-up of the station? Do you use an ordinary vacuum-cleaner? Do you wash your dishes or use disposable dishes?", "Do you play any kind of games? Is there any game onboard specialised to weightlessness?"]*

ATV Reboost Update: The ISS reboost with ATV1 "Jules Verne" OCS (main propulsion) thrusters was started at 12:37pm EDT for 20 min 37 s and completed nominally. Actual Delta-V was 4.15 m/s vs. 4.1 m/s planned, resulting in a mean altitude increase of 7.21 km (3.88 nmi). Purpose of the reboost maneuver was altitude maintenance.

CEO (Crew Earth Observations) photo targets uplinked for today were **Pilcomayo River dynamics, N Argentina** *(the Pilcomayo River rises in the Andes foothills,*

and then flows over 2,000 km southeast across central South America. As the ISS approached the area from the SW in mid-afternoon, Greg was to look to the left of track for the river. Requested were detailed mapping views along the river course to document current channel configuration and adjacent vegetation and land use patterns), and **High Central Andean Glaciers** *(these tiny, isolated ice fields and glaciers are located only in the highest elevations along the crest of the Andes Mountains within the Tropics and are the remnants of more extensive features during recent ice ages. Earlier in Increment 17 the crew acquired excellent imagery of a few of these features. On this fair-weather pass in mid-afternoon, CEO researchers hoped that Greg could acquire additional views of this and other small glacial features in this target area).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 9:03am EDT [= epoch]):*
Mean altitude -- 351.3 km
Apogee height -- 357.9 km
Perigee height -- 344.6 km
Period -- 91.56 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0009847
Solar Beta Angle -- 59.3 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.73
Mean altitude gain in the last 24 hours -- 7200 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55441

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
08/30/08 -- Progress M-64/29P undocking, from FGB nadir
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**

11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
03/25/09 -- Soyuz TMA-14/18S launch
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May '09)**
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/23/08
Date:	Wednesday, July 23, 2008 12:45:58 PM
Attachments:	

ISS On-Orbit Status 07/23/08

All ISS systems continue to function nominally, except those noted previously or below.

Before breakfast & first exercise, CDR Volkov, FE-1 Kononenko and FE-2 Chamitoff completed a full session with the Russian crew health monitoring program's medical assessment MO-9/Biochemical Urinalysis. Afterwards, the FE-1 closed out and stowed the Urolux hardware. *[MO-9 is conducted every 30 days (and also before and after EVAs) and is one of five nominal Russian medical tests adopted by NASA for U.S. crewmembers for IMG PHS (Integrated Medical Group/ Periodic Health Status) evaluation as part of the "PHS/Without Blood Labs" exam. The analysis uses the sophisticated in-vitro diagnostic apparatus Urolux developed originally for the Mir program. Afterwards, the data are entered in the MEC (Medical Equipment Computer)'s special IFEP software (In-Flight Examination Program).]*

The CDR serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out"-to-vacuum cycle on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~4:25pm EDT. Filter bed #1 was regenerated yesterday. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time done: 7/16&17).]*

Continuing the current round of preventive maintenance on the Russian Segment (RS) ventilation system, Oleg Kononenko cleaned the ventilation screens on interior panels of the *Funktsionalnyi-Grusovoi Blok* (FGB).

Later, Sergey Volkov replaced the four dust collector filters (PF1-4) in the Service Module (SM).

Prior to attitude control authority handover to RS thrusters for maneuvering to ATV reboost attitude, Gregory closed the protective Lab window shutter, keeping it closed until two orbits after returning to U.S. Momentum Management. *[For the ATV reboost at 12:18pm EDT, attitude control was handed over to RS at 10:35am, to be returned to US Momentum Management at 1:20pm.]*

For the recently arrived FE-2, the CDR and Gregory performed the mandatory CHeCS (Crew Health Care Systems) emergency/contingency medical OBT (on-board training) drill, a one-hour U.S. exercise designed to refresh crewmembers' acuity in applying HMS (Health Maintenance System) equipment like ACLS (Advanced Cardio Life Support) in an emergency. *[The drill gives crewmembers the opportunity to work as a team in resolving a simulated medical emergency onboard ISS and to refresh their memory of on-orbit stowage and deployment locations, equipment use, and procedures. Setting up (but not actually operating/ manipulating) onboard equipment such as the RSP (Respiratory Support Pack), ALSP (Advanced Life Support Pack), intubation kit, HMS defibrillator, all stowed in the Lab CHeCS rack, and the CMRS (Crew Medical Restraint System), Gregory and Sergey stepped through the ACLS algorithm manual to resolve a simulated medical emergency onboard ISS. Objectives of the exercise include practicing communication and coordination necessary to perform medical emergency procedures, locating appropriate emergency medical components, and determining each crewmember's individual method of delivering CPR (cardio-pulmonary resuscitation) in zero-G.]*

In the Kibo JPM (JEM Pressurized Module), Chamitoff activated and checked out the internal TV camera, then installed a payload laptop terminal at the JPM forward Deck4 position, connected to the FD4 UOP (Utility Outlet Panel).

On the JAXA SCOF (Solution Crystallization Observation Facility), Gregory completed post-launch reconfiguration on the experiment equipment (pushing an inside rod down), then photo-documented the set-up.

Kononenko serviced the Matryoshka-R (RBO-3-2) radiation payload which has taken over the ESA/RSC-Energia experiment ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS/ALC) with its Spectrometer (AST) and ALC equipment on DC1 panel 429. *[Oleg retrieved the ALC-952 PCMCIA (Portable Computer Memory Card International Adapter), checked up on the size of the new file on it for downlink to TsUP-Moscow via OCA, then re-inserted the #952 card into the AST PCMCIA slot.]*

The FE-1 used the standard ECOSFERA equipment, set up yesterday, to conduct microbial air sampling runs for the MedOps SZM-MO-21 experiment, with the POTOK Air Purification System temporarily powered down, taking samples from

cabin surfaces along with samples from crewmembers for sanitation and disease studies. Samples were also collected in the ATV, using spare medium-carrying Petri dishes. The sample tubes were then stowed in the Kriogem-03 refrigerator for return on TMA-12. *[The equipment, consisting of an air sampler set, a charger and power supply unit, provides samples to help determine microbial contamination of the ISS atmosphere, specifically the total bacterial and fungal microflora counts and microflora composition according to morphologic criteria of microorganism colonies.]*

Preparatory to taking dynamic/vibrational data during the ATV reboost, Volkov & Chamitoff replaced the IWIS RSU #1027 (Internal Wireless Instrumentation System/ Remote Sensor Unit 1027) with RSU #1026, then set up the IWIS operational configuration. Later, at ~2:00pm, IWIS was powered down again.

The FE-2 gathered the necessary equipment for the OpsLAN (Operations Local Area Network) software reload ahead. Afterwards, Gregory connected SSCs (Station Support Computers) 13 & 14 to the JSL (Joint Station LAN) for the OpsLAN reload. *[SSC-13 was connected to the Lab ISL (Integrated Station OpsLAN) Router, SSC-14 to the Node-2 ISL Router via a drag-thru Ethernet cable.]*

Using the "Chibis" garment from yesterday, Oleg Kononenko underwent the MBI-5 KARDIO-ODNT exercise, with Sergey assisting as CMO (Crew Medical Officer). MBI-5 is an extensive cardiovascular test of human pericardium (heart muscle) activity as well as of primary parameters of central and regional blood circulation at rest and under the effect of lower body negative pressure (LBNP, Russian: ODNT). MBI-5 was closed out at ~12:00pm, followed by a medical health conference for Sergey & Oleg with ground specialists via S- band. *[The LBNP applies a lower than ambient pressure to the body from the hips down to simulate 1g loads normally experienced on Earth. This acts as an orthostatic stressor and can be used to study deconditioning of the human cardiovascular system in space. The Chibis provides gravity-simulating stress to the body's cardiovascular/circulatory system for evaluation of Sergey's orthostatic tolerance (e.g., the Gauer-Henry reflex) after 14 weeks in zero-G. The MBI-5 protocol again consisted of first imbibing 150-200 milliliters of water or juice, followed by a sequence of progressive regimes of reduced ("negative") pressure, set at -25, -30, -35 and -40 mmHg for five minutes each, while shifting from foot to foot at 10-12 steps per minute. The body's circulatory system interprets the pressure differential between upper and lower body as a gravity-like force pulling the blood and body fluids "down". MBI-5 data output include blood pressure readings with the Tenzoplus Sphygmomanometer, today without telemetry data monitoring but reporting of heart rate and blood pressure to TsUP-Moscow.]*

In preparation of the next SHERE (Shear History Extension Rheology Experiment) session, which will use the CGBA (Commercial Generic Bioprocessing

Apparatus), the FE-2 installed a fluid module tray inside the CGBA.

The CDR took the periodic readings of potentially harmful atmospheric contaminants in the SM, using the CMS (Countermeasure System), a component of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, which uses preprogrammed microchips to measure H_2CO (Formaldehyde, methanal), CO (Carbon Monoxide), NH_3 (Ammonia) and C_8H_8 (Styrol, Phenylethen) (for today, instead Benzol), taking one measurement per microchip. [CMS is a subsystem of the Russian SKDS Pressure Control & Atmosphere Monitoring Syst*em.]*

The FE-1 completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (CDR). Later, Kononenko transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~2:50pm EDT, the crew will convene for their standard bi-weekly teleconference with the JSC Astronaut Office (Steve Lindsey), via S-band S/G-2 audio & phone patch.

CEO (Crew Earth Observation) photo targets uplinked for today were **Kwanza Basin** *(this region of extreme northwestern Angola is undergoing rapid land use changes as resource development is increasing. CEO researchers requested context mapping views during this pass. It was mid-afternoon as ISS approached from the SW. Morning low clouds will have burned off by then, especially in the interior. Trying for a detailed mapping swath of the clear area),* and **Lake Poopo, Bolivia** *(Lake Poopo is located at the southern end of the Altiplano region of Bolivia. Greg has recently acquired good imagery of this target area with the 180mm lens settings. These photos indicate that the lake water levels are very low. On this pass, Greg was to look just left of track and try for detailed views of only the lake and its shorelines, especially the southern end).*

CEO photography can be studied at this “Gateway” website:

http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit (awaiting reboost results).

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
08/30/08 -- Progress M-64/29P undocking, from FGB nadir
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
03/25/09 -- Soyuz TMA-14/18S launch
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May '09)**
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12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/22/08
Date:	Tuesday, July 22, 2008 3:03:20 PM
Attachments:	

ISS On-Orbit Status 07/22/08

All ISS systems continue to function nominally, except those noted previously or below.

FE-1 Kononenko performed the periodic service of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The process will be terminated around sleeptime, at ~4:40pm EDT. Bed #2 regeneration follows tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time: 6/23&24).]*

CDR Volkov set up the electric pump and transfer equipment with pressure adapter, then transferred the remaining water from the WDS1 (Water Delivery System 1) tank of the ATV (Automated Transfer Vehicle), filling two EDV containers, to be used for electrolysis in the Elektron oxygen generator.

The FE-1 performed the periodic AST spectrometer repositioning for the MATRYOSHKA-R (RBO-3-2) radiation instrumentation, rotating the AST by 90 deg around the Y-axis to face along the FGB. Afterwards, Oleg retrieved the #951 PCMCIA memory card from the AST, checked it for contents before stowing it, and then installed a new card, #952, from an ALTCRISS kit. Photographs were taken of the setup and downlinked to TsUP-Moscow. *[RBO-3-2 is using the ESA/RSC-Energia experiment ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS/ALC) with its Spectrometer (AST) and ALC equipment, located now again in the DC1 Docking Compartment).]*

Gregory Chamitoff had a full plate of activities, viz.:

- Replacing the battery of the prime CSA-CP (Compound Specific Analyzer-Combustion Products) with a new battery (#1248),

- Updating the SODF/Station Operation Data File C&W (Caution & Warning) books to reflect the currently ongoing software transition of the S1 & P1 MDMs (Multiplexer/Demultiplexer) computers to vers. R3 *[today's transition was for the S1-2 & P1-1 MDMs, to be followed by the S1-1 & P1-2 MDMs tomorrow]*,
- Continuing FSL (Fluid Science Laboratory) commissioning in the COL (Columbus Orbital Laboratory) by reconfiguring for the Optical Test 1, afterwards removing the two test targets, installing the OPT TGT (Optical Target) and activating the FSL for optical monitoring,
- Preparing for reloading the OpsLAN (Operations Local Area Network plus reviewing the procedures for the OpsLAN reload,
- Conducting a teleconference with ground specialists at ~12:05pm EDT on the OpsLAN reload *[the primary OpsLAN reload activities, scheduled on 7/23, 7/24 & 7/25, consist of four major pieces: reloading the File Server, reload of SSCs (Station Support Computers) 12-15, preparation for reloading SSCs 1-11, and the ground administration of the reload of SSCs 1-11]*, and
- Setting up an A31p laptop at the RWS (Robotics Workstation) to use the IPV (International Procedures Viewer) DVD during the reload (in the event that he needs an electronic procedure, such as a caution procedure, during the reload),
- Dumping MEC (Medical Equipment Computer) data logs for inspection after last night's reload by the ground, and
- Performing the periodic (monthly) inspection of the RED (Resistive Exercise Device) canister cords and accessories.

Kononenko began a new round of periodic preventive maintenance of cabin ventilation systems in the RS (Russian Segment), today cleaning fan grilles in the Service Module (SM).

Volkov set up the "Chibis" garment , an extensive cardiovascular test of human pericardium (heart muscle) activity as well as of primary parameters of central and regional blood circulation at rest and under the effect of lower body negative pressure (LBNP, Russian: ODNT). Sergey then underwent the MBI-5 LBNP exercise, with Oleg assisting as CMO (Crew Medical Officer). MBI-5 was closed out at ~1:00pm, with ground specialist tagup via S- band. *[The LBNP applies a lower than ambient pressure to the body from the hips down to simulate 1g loads normally experienced on Earth. This acts as an orthostatic stressor and can be used to study deconditioning of the human cardiovascular system in space. The Chibis provides gravity-simulating stress to the body's cardiovascular/circulatory system for evaluation of Sergey's orthostatic tolerance (e.g., the Gauer-Henry reflex) after 14 weeks in zero-G. The MBI-5 protocol again consisted of first imbibing 150-200 milliliters of water or juice, followed by a sequence of progressive*

regimes of reduced ("negative") pressure, set at -25, -30, -35 and -40 mmHg for five minutes each, while shifting from foot to foot at 10-12 steps per minute. The body's circulatory system interprets the pressure differential between upper and lower body as a gravity-like force pulling the blood and body fluids "down". MBI-5 data output include blood pressure readings with the Tenzoplus Sphygmomanometer, today without telemetry data monitoring but reporting of heart rate and blood pressure to TsUP-Moscow.]

In preparation for a microbial air sampling session scheduled tomorrow, later today (~2:05pm) the CDR will unstow and set up the MedOps SZM-MO-21 ECOSFERA equipment, initiating charging on the Ecosphere power pack (BP) and activating the KRIOGEM-03 refrigerator for the samples. *[The equipment, consisting of an air sampler set, a charger, power supply unit, and incubation tray for Petri dishes, determines microbial contamination of the ISS atmosphere, specifically the total bacterial and fungal microflora counts and microflora composition according to morphologic criteria of microorganism colonies.]*

The FE-1 conducted the periodic checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the passageways SM PrK (Service Module Transfer Compartment)–ATV, PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1.

The CDR completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Kononenko performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1). Later, Oleg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

ATV1 Reboost Preview: Tomorrow's ISS reboost by the ATV is scheduled for a TIG (Time of Ignition) of 12:18pm EDT for 20min 37s, to yield an expected delta-V of 4.1 m/s (13.5 ft/s). Expected mean altitude increase is 7.21 km (3.89 n.mi.). The purpose of the reboost is for altitude maintenance and to set up phasing for upcoming visiting vehicles.

VolSci Program Preview: For the weekend of August 2-3, Greg Chamitoff was offered three choices: (1) SHERE (Shear History Extensional Rheology Experiment) science runs in the CGBA; (2) an "operations improvement" session with SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellites) with all three satellites; and (3) a LOCAD PTS (Lab-On-A-Chip Application Development – Portable Test System) surface sampling session using Glucan LAL cartridges, targeting yeast & molds on ISS surfaces.

CEO (Crew Earth Observation) photo targets uplinked for today were **Polar Mesospheric Clouds (PMC) over Northwestern North America** *(DYNAMIC EVENT: The low-light window of opportunity for this pass ran for about 10-12 minutes from the central Aleutian Islands to just off the coast of southern California. These were high oblique views left of track towards darker parts of the Earth's limb),* and **PMC over Northern Asia** *(DYNAMIC EVENT: The low-light window of opportunity for this pass ran for about 10-12 minutes from the central Ural Mountains of Russia to the eastern China. These were high oblique views left of track towards the darker parts of the Earth's limb.)*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 3:53am EDT [= epoch]):*
Mean altitude -- 344.1 km
Apogee height -- 350.9 km
Perigee height -- 337.4 km
Period -- 91.42 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0010008
Solar Beta Angle -- 67.2 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 40 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55406

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/23/08 -- ATV1 reboost (12:18pm EDT)
08/30/08 -- Progress M-64/29P undocking, from FGB nadir

09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
03/25/09 -- Soyuz TMA-14/18S launch
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May ’09)**
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/21/08
Date:	Monday, July 21, 2008 3:28:57 PM
Attachments:	

ISS On-Orbit Status 07/21/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 14 of Increment 17.*

CDR Volkov, FE-1 Kononenko and FE-2 Chamitoff began their workday before breakfast with the periodic session of the Russian biomedical routine assessments PZEh-MO-7/Calf Volume Measurement & PZEh-MO-8/Body Mass Measurement (fifth for CDR & FE-1, third for FE-2), using the IM mass measurement device which Sergey Volkov broke down afterwards for stowage. *[Calf measurements (left leg only) are taken with the IZOG device, a custom-sewn fabric cuff that fits over the calf, using the knee and lower foot as fixed reference pints, to provide a rough index of deconditioning in zero-G and effectiveness of countermeasures. For determining body mass in zero-G, where things are weightless but not massless, the Russian IM "scales" measure the inertial forces that arise during the oscillatory motion of a mass driven by two helical metering springs with known spring constants. By measuring the time period of each oscillation of the unknown mass (the crewmember) and comparing it to the period of a known mass, the crewmember's mass is calculated by the computer and displayed.]*

The FE-2 conducted another one of the periodic offloadings of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1054) with the collected water slated for processing. No samples were required. *[Estimated offload time before reaching the tank's neutral point (leaving ~6 kg in the tank): ~30 min. Condensate collection continues to be performed by the CCAA while the Russian SKV-2 air conditioner is off, awaiting its overdue Khladon (Freon-218) refill. SKV-1 has been nonfunctional for a long time. Greg was approved to use CWC #1062 in the event that #1054 is still full. Only these two CWCs are used for Lab condensate offloads.]*

The CDR & FE-1 spent several hours in the DC1 Docking Compartment to reconfigure the "Pirs" airlock module after the recent EVA-20. The reconfiguring

included the re-installation of the MATRYOSHKA-R radiation experiment with its antroph-amorphous (human torso) "Phantom" setup with 16 passive dosimeters and the LULIN-5 electronics box, which was activated. *[The complex Matryoshka payload suite is designed for sophisticated radiation studies. The payload collects radiation measurements every few minutes of each hour around the clock. Note: Matryoshka is the name for the traditional Russian set of nested dolls, also called Babushka dolls when they are little old ladies ("grandmas").]*

Subsequently, Volkov supported the ground's activation of the Elektron O_2 generator at 32 amps by monitoring the external temperature of its secondary purification unit (BD) for the first 10 minutes of operations to ensure that there is no overheating. In support of the reactivation, the ground electrically disconnected the ATV (Automated Transfer Vehicle) from the ISS at 6:47am EDT which required turning off lights in "Jules Verne". The lights were turned back on at ~8:21am. *[During nominal Elektron operations a gas analyzer is utilized to detect hydrogen (H_2) in the O_2 line (which could cause overheating) but is not included in the control algorithm until 10 minutes after Elektron startup.]*

Chamitoff performed activation & checkout work in the JAXA Kibo JPM (JEM Pressurized Module), reconfiguring the CBEF (Cell Biology Experiment Facility) subrack equipment through several stages.

Afterwards, Gregory remated and reconfigured the ISPR-2 (International Standard Payload Rack 2) SAIBO rack, performing Upper and Lower Closeout installation. *[SAIBO ("living cell") is a Japanese multipurpose experiment/payload rack system on the ISS that transports, stores and supports subrack facilities such as the CB (Clean Bench) and CBEF (Cell Biology Experiment Facility) equipment by providing structural interfaces, power, data, cooling, water and other items needed to operate science experiments in microgravity.]*

Later, the FE-2 checked out the Japanese fire alarm indicators in the JLP (JEM Logistics Pressurized Segment), JEMRMS (JEM Robotic Manipulator System), ISPR-A2 and ISPR-A3 racks, then moved stowage from COL (Columbus Orbital Laboratory) and Node-2 into Kibo, documenting some work areas photographically.

Chamitoff also supported the ground in powering up the SAMS ICU (Space Acceleration Measurement System/Interface Control Unit).

Sergey & Oleg underwent their third periodic (generally monthly) health test with the cardiological experiment PZEh MO-1 ("Study of the Bioelectric Activity of the Heart at Rest") on the TVIS (Treadmill with Vibration Isolation System). *[During the 40-min. test, the crewmembers tagged up with ground specialists on an RGS (Russian*

ground site) pass (~12:15pm EDT) via VHF and downlinked data from the Gamma-1M ECG (electrocardiograph) for about 5-6 minutes.]

The FE-1 completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The CDR meanwhile performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Working on the failed MEC (Medical Equipment Computer), Gregory Chamitoff swapped the laptop's 60 GB hard drive and reloaded software. These activities were originally scheduled for 7/25, but were pulled forward in order to expedite the recovery of the A31p laptop. MEC data will be re-uplinked tonight during crew sleep. *[The MEC failed on 7/19 while Greg was setting up for the BP/ECG (Blood Pressure/Electrocardiogram) Checkout activity. Even after multiple reboots the laptop could not be used. Since MEC is an integral part of the BP/ECG Checkout, no BP/ECG data could be collected. In addition, the MEC is necessary for recording and storing all crew medical and exercise data. The lack of a MEC also prevents the execution of the PFE w/OUM (Periodic Fitness Evaluation with Oxygen Uptake Measurement) activity next week since no BP/ECG or Heart Rate Monitor data can be collected. Thus, the PFE w/OUM session scheduled tomorrow was removed from the plan and will be rescheduled.]*

The FE-2 had ~35 min to troubleshoot the Columbus SOLAR (Solar Monitoring Observatory) experiment, trying to diagnose the connectivity between Columbus and the external SOLAR, using the ESA Multi-Purpose Laptop. *[SOLAR is currently powered via the feeder#2 (survival) only and all instruments are off. All of the past Sun observation period data acquisitions have been lost, from sun visibility windows that closed on 7/7. Ground engineers are awaiting the outcome of today's troubleshooting to revive SOLAR, so that it is fully operational when the next Sun observation window starts on 7/30.]*

In the ER4 (EXPRESS Rack 4), Chamitoff replaced failed light bulbs, in ER3 failed power indicators. The broken/defective items were placed in a Ziplock bag for return to Earth.

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (FE-1, FE-2), and VELO bike with bungee cord load trainer (FE-1).

MDM Software Upgrade: At ~10:10am, the ground began a two-hour activity of uploading a new version of ALSYS software to the Airlock MDM (Multiplexer/ Demultiplexer) computers.

VolSci Kudos: Gregory was thanked for yesterday's Voluntary Science program with SHERE (Shear History Extensional Rheology Experiment) checkout tests which were "a great success and showed that the SHERE hardware is functioning properly. We look forward to working with you again next Saturday to perform the Dry Run."

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:07am EDT [= epoch]):*
Mean altitude -- 344.2 km
Apogee height -- 350.8 km
Perigee height -- 337.5 km
Period -- 91.42 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0009918
Solar Beta Angle -- 70.1 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 22 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55393

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/23/08 -- ATV1 reboost (~12:06pm EDT)
08/30/08 -- Progress M-64/29P undocking, from FGB nadir
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)

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10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port)
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02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
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05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May '09)**
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/20/08
Date:	Sunday, July 20, 2008 3:45:38 PM
Attachments:	

ISS On-Orbit Status 07/20/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – rest day for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff. Ahead: Week 14 of Increment 17.*

Today 39 years ago (July 20, 1969), Apollo 11 fulfilled a dream of Earth people when Neil Armstrong and Buzz Aldrin landed their LM "Eagle" on the Moon at Tranquility Base, with Michael Collins orbiting overhead in the mothership Columbia.

Crew sleep cycle has returned to normal times: wake-up -- 2:00am EDT, sleeptime -- 5:30pm.

Continuing the extended leak checking of the spare BZh Liquid Unit (#056) for the Elektron O_2 generator, Kononenko charged the unit once again with pressurized N_2 from the BPA Nitrogen Purge Unit (#23) to 1 atm (1 kg/cm^2). The last test pressurization to monitor for leakage was on 6/27. *[During Elektron operation, the inert gas locked up in the BZh has the purpose to prevent dangerous O_2/H_2 mixing. A leaking BZh cannot be used.]*

For his Voluntary Weekend Science (VolSci) program today, FE-2 Chamitoff has selected a session with the new SHERE (Shear History Extensional Rheology Experiment) payload, first activating the MSG (Microgravity Science Glovebox), powering on the experiment, aligning the disk, then performing the four checkout tests that will verify proper operation of the SHERE hardware (force transducer, laser micrometer test, camera, data transfer), followed by experiment shutdown and MSG deactivation. *[SHERE, which has never before been performed in micro-G, studies the effect of preshearing (rotation) on the stress and strain response of a polymer fluid (a complex fluid containing long chains of polymer molecules) being stretched in micro-G. The fundamental understanding & measurement of the*

extensional rheology of complex fluids is important for understanding containerless processing, an important operation for fabrication of parts (such as adhesives or fillers) using elastomeric materials on future exploration missions. This knowledge can be applied as well to controlling and improving Earth-based manufacturing processes.]

Sergey Volkov conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

Working off his suggested “time permitting” task list, FE-1 Kononenko conducted another session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program, using the D2X digital camera with the F800 telephoto lens. *[Uplinked target areas were Patagonian glaciers and icebergs near South Georgia Island.]*

Also working from the discretionary task list, Oleg conducted another run of the Russian DZZ-2 "Diatomeya" ocean observations program, using the NIKON-F5 DCS still camera and the HDV (high-definition) video camcorder from SM window 8 for ~20 min to record high production water areas for obtaining data on color field composition in dynamic regions of the ocean and in near-estuary areas of large rivers, plus the current cloud cover above these waters, its rating, and special forms of cloud formation. *[Target zones today in the South Atlantic were the Parana river runoff area (Argentina), Bahia Grande (Argentina), the Falkland Islands, and the Namibia offshore area.]*

For the CDR, a discretionary task list job was another session for Russia's Environmental Safety Agency (EKON), making observations and taking KPT-3 aerial photography of environmental conditions of the Indian Ocean (Chagos Archipelago) and the New Zealand islands coastal area.

MEC Failure: Yesterday, the Medical Equipment Computer (MEC) failed while Gregory was setting up for the BP/ECG (Blood Pressure/Electrocardiogram) Checkout activity. Even after multiple reboots the laptop could not be used. Since MEC is an integral part of the BP/ECG Checkout, no BP/ECG data could be

collected. In addition, the MEC is necessary for recording and storing all crew medical and exercise data. The lack of a MEC also prevents the execution of the PFE w/OUM (Periodic Fitness Evaluation with Oxygen Uptake Measurement) activity next week since no BP/ECG or Heart Rate Monitor data can be collected. Thus, the PFE w/OUM session scheduled on 7/22 was removed from the plan and will be rescheduled. The MEC hard drive swap and software reloads previously scheduled for 7/25 have been moved forward to tomorrow in order to expedite the recovery of the MEC.

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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Perigee height -- 337.5 km
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Eccentricity -- 0.0009861
Solar Beta Angle -- 71.9 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 33 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55377

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
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08/30/08 -- Progress M-64/29P undocking, from FGB nadir
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
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11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
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11/28/08 -- Progress M-66/31P docking
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
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03/25/09 -- Soyuz TMA-14/18S launch
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
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02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/19/08
Date:	Saturday, July 19, 2008 5:08:34 PM
Attachments:	

ISS On-Orbit Status 07/19/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – mostly off duty for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff.*

Upon wake-up, Sergey Volkov terminated his sixth MBI-12 SONOKARD experiment session for the long-term Russian sleep study, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the Service Module (SM) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

As part of the house cleaning, the crew also conducted regular maintenance inspection & cleaning on fan grilles in the FGB (TsV2), SM (VPkhO, VPrK, FS5, FS6 & FS9), DC1 (V3) screens and PF1/PF2 dust filters, as well as in the COL (Columbus Orbital Laboratory).

In addition, Volkov temporarily powered down the POTOK air filtration system for the periodic cleaning of its pre-filter, using the vacuum cleaner with narrow-slit nozzle attachment.

At ~10:20am EDT, the crewmembers conducted their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

Chamitoff retrieved and stowed the four passive FMK (Formaldehyde Monitoring Kit) sampling assemblies deployed by him on 7/17 in the Lab (at P3, below CEVIS) and SM (at the most forward handrail, on panel 307), to catch any atmospheric formaldehyde on a collector substrate for subsequent analysis on the ground. *[Two monitors each are usually attached side by side, preferably in an orientation with their faces perpendicular to the direction of air flow.]*

The FE-2 did another sample rearrangement in the MELFI (Minus Eighty Degree Laboratory Freezer for the ISS), swapping blood and urine samples in their box modules between two Dewars of different temperature. *[Sample vials were swapped between Dewar 1/Tray A/Sect.1.2 and Dewar 2/Tray A/Sects. 2 & 3.]*

Greg also conducted the periodic ACO (activation & checkout) of the BPM (Blood Pressure Monitor) and ECG (Electrocardiogram) Recorder. *[The BP/ECG ACO today, in preparation for next week's PFE w/ OUM activity, included steps to correct some issues encountered during the previous use of the BP/ECG,.]*

The two cosmonauts had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Oleg at ~8:50am EDT, Sergey at ~11:50am.

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Greg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

For Oleg Kononenko, today's Russian discretionary task list held one job – doing another session of the GFI-8 "Uragan" (hurricane) earth-imaging program, using the D2X digital camera with the F800 telephoto lens. *[Uplinked target areas were*

Patagonian glaciers and icebergs near South Georgia Island.]

For Sergey Volkov, a new discretionary task list job was another session for Russia's Environmental Safety Agency (EKON), making observations and taking KPT-3 aerial photography of environmental conditions using the Nikon D2X with the SIGMA 300-800mm telephoto lens.

Weekly Science Update *(Expedition Seventeen -- Week 13)*

3-D SPACE: Third session for Greg Chamitoff will be planned in the near future.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Measurements continue in the FGB module. Last memory card exchange was performed on 7/1. Next activities are planned on 7/22 for the rotation of the ALTEINO instrument and the exchange of the memory card. Subsequent data downlink is currently planned on 7/23.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): The Silicate Garden Hab S/N2 ground unit was activated at approximately 5:15pm EDT on 7/11. The flight unit was activated at approximately 1:25pm on 7/14 via remote command. There are 2 cameras in the flight unit imaging 2 chambers each for a total of 4 chambers on Side 1. Fibers continue to grow from the crystals in strange formations in the flight unit.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): On 7/16, EuTEF encountered a MIL-Bus error (this happened in a similar way in the past). The platform has to be powered cycled and all of the instruments have to be re-initiated. A DHPU (Data Handling Processing Unit) software patch is currently being developed to fix the link error issues encountered with DEBIE-2 and FIPEX instruments.-- DEBIE-2: several 24hrs run were successfully performed between 7/13 and 7/15. Generic status: link error still in work. However a work-around allows for regular science data acquisition using an on-board IOP (Instrument Operations Procedure), but not yet in conjunction with any FIPEX IOP – a final software patch, which will enhance the present instrument capabilities, is under finalization on ground;-- DOSTEL: On-going science acquisition;-- EuTEMP: Currently inactive as planned;-- EVC: foreseen EVC activation on 7/10 was not performed due to low temperatures;-- EXPOSE: On-going science acquisition;-- FIPEX: Weekly science script has been started nominally on 7/16. However after the EuTEF MIL-Bus error, this script was interrupted and has not been restarted yet; -- MEDET: Continuously acquiring science data, but its temperature is very low. This instrument was also impacted by the EuTEF MIL-Bus error and will be restarted on 7/17; -- PLEGPAY: Last runs were successfully performed on 7/9. Currently in READY mode, no science data acquisition on-going;-- TRIBOLAB: The Ball-Bearing experiment 1/2/3 has been running since 6/16. On 7/10 it has been paused for Station activities. TRIBOLAB will be commanded into Thermal Stabilization Mode on 7/11 and then continue the Ball-Bearing experiment again on 7/12. TRIBOLAB went to NNM (Non Nominal Mode) on 7/14. The instrument was put back into Thermal Stabilization Mode on 7/16, but LAN connectivity with SOLAR has been lost since 6/25.

FSL (Fluid Science Laboratory): FSL is back and running. Further FSL commissioning activities remain to be done (see following item).

GEOFLOW: Additional optical check-out tests will be performed from ground on 7/22. The crew will then swap the optical target on 7/23, stand by until further optical modes checks (planned from 7/23 to 7/25. The GEOFLOW Experiment Container insertion into FSL is currently planned on 7/28. After some initial tests, the GEOFLOW science program is planned to be started on 7/29.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Planned.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer, ESA): In progress.

NUTRITION w/REPOSITORY: In progress.

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): In progress.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): In progress.

SOLAR (Solar Monitoring Observatory): SOLAR is currently powered via the feeder#2 (survival) only and all instruments are off. Troubleshooting plan has been worked out and a crew activity has been planned for 7/21 to diagnose the connectivity between Columbus and SOLAR, making use of the ESA Multi-Purpose Laptop. Unfortunately all of the past Sun observation period data acquisition has been lost. These sun visibility windows closed on 7/7. The engineering teams on

ground are awaiting the outcome of the troubleshooting activity on 7/21 to revive SOLAR, so that it is fully operational when the next Sun observation window starts on 7/30.-- SOVIM: Instrument switched off pending above issue; -- SOLSPEC: Instrument switched off pending above issue;-- SOLACES: Instrument switched off pending above issue.

SOLO: Planned.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): The four ECs (Experiment Containers) of Rotor B are yet to be retrieved by the crew from the blocked Rotor B. BIOLAB could not be activated from ground yet, pending resolution of the Smoke Detector issue. A troubleshooting plan has been developed to recover all the BIOLAB functionalities. The remaining WAICO-#1 ECs will be disposed and replaced by six Reference ECs on Rotor B.

CEO (Crew Earth Observations): Through 7/15 the ground has received a total of 3,391 frames of CEO images for review and cataloging. New imagery received this week with times corresponding to CEO target request times included: Lake Poopo, Bolivia (interesting new imagery of the target is now under review); Jarvis Island, equatorial Pacific (only a solitary, late-shot frame of this isolated island); and Moorea Coral Reef, Tahiti (good imagery acquired, a bit late-oblique, and a touch soft). “As you are aware CEO target opportunities have been limited by low light and winter weather. It will take good fortune to spot even a large, bright iceberg under those conditions. We hope you may have better luck with the Polar Mesospheric Cloud opportunities. This lull is allowing us to work through our backlog. You shot excellent imagery of: Mount Rainer in with snow, the Red River Valley, the Tigris-Euphrates Delta, and much of the Afar Rift Zone target. Good work! We suggest technique-wise that you continue to practice with the long lens settings to improve consistency of focus, and continue to practice providing an overlap between successive images when mapping a feature or a regional target. The composition and quality of your images is high and we do appreciate you all your efforts.”

CEO photo targets uplinked for today were **Polar Mesospheric Clouds (PMC)**

over Far Eastern Asia *(DYNAMIC EVENT: Greg's low light window of opportunity for this pass ran for about 10-12 minutes from the eastern China to the central Aleutian Islands. These will be high oblique views left of track towards the Earth's limb),* and **PMC** over Northeastern Europe *(DYNAMIC EVENT: Chamitoff's low light window of opportunity for this pass ran for about 10-12 minutes from the Algerian Coast to the central Ural Mountains of Russia. These were high oblique views left of track towards the Earth's limb).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 5:36am EDT [= epoch]):*
Mean altitude -- 344.2 km
Apogee height -- 350.7 km
Perigee height -- 337.7 km
Period -- 91.42 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0009682
Solar Beta Angle -- 72.2 deg (magnitude peaking)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 30 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55360

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/23/08 -- ATV1 reboost (~12:06pm EDT)
08/30/08 -- Progress M-64/29P undocking, from FGB nadir
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking

02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
03/25/09 -- Soyuz TMA-14/18S launch
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May '09)**
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/18/08
Date:	Friday, July 18, 2008 1:03:30 PM
Attachments:	

ISS On-Orbit Status 07/18/08

All ISS systems continue to function nominally, except those noted previously or below.

Crew Sleep Cycle: Wakeup today was at 4:30am; sleeptime tonight remains at 8:00pm EDT.

Upon wake-up, Oleg Kononenko terminated his sixth MBI-12 SONOKARD experiment session for the long-term Russian sleep study, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. Sergey Volkov's new MBI-12 session starts tonight (~7:15pm). *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

In the DC-1 Docking Compartment, CDR Volkov terminated the discharge process on the second set of 825-M3 Orlan batteries and initiated it on the third set. Later tonight (~7:40pm), he will also terminate discharging the third set.

Afterwards, Volkov & Kononenko worked on the Progress M-64/29P cargo ship, re-integrating it with the ISS by

- Conducting a leak check between 29P and the FGB module,
- Opening the Progress/FGB hatches,
- Installing the LKT local temperature sensor commutator (TA251MB) of the BITS2-12 onboard telemetry measurement system, along with its ROM unit (read-only memory, TA765B) *[LKT was subsequently switched on by the*

ground to complete the basic configuration.]

- Deactivating the Progress vehicle, and
- Closing out 29P re-integration operations.

Later, the CDR initiated, then terminated, a repress of the ISS cabin atmosphere with compressed air from Progress 29P tankage by ~18-20 mmHg.

Gregory Chamitoff had 4h 50min reserved for removing & replacing the Flexpacks in both RED (Resistive Exercise Device) canisters, along with spacers and canister cords, with on-orbit spares. The installation included the regular calibration of both canisters. *[The Flexpacks (one each in the two RED canisters, not swappable) were approaching the end of their certified life of 289,000 cycles. The R&R involves replacement of the Canister Cords, Flexpack Assemblies, External Splines, and Spacers. Following the changeout, Greg performed the usual calibration, wearing special footwear (athletic shoes), to allow accurate execution of exercise protocol objectives. The calibration confirms a good Flexpack replacement, identifies the maximum allowed settings and allows for adjusting each crewmember's RED exercise protocols accordingly. The canisters are only certified to a maximum load of 160 lbs each. If at any point doing the calibration, a load of 160 lbs or greater is reached before getting to the last load index setting of 5.5, the calibration is not to proceed to the next higher setting and MCC-H must be notified. Upon receipt of the results of the calibration data, ground specialists will review the data and, assuming favorable engineering analysis, will get back to the crew quickly to give them a GO for their RED exercise session. Calibration of the load settings of the pulley cans is performed with an on-orbit calibration kit with a special calibration tool and steel handles.]*

Sergey conducted the periodic maintenance/checkout of the spare BZh Liquid Unit (#056) for the Elektron O_2 generator, *[Objective of the checkout of the BZh, which has been in stowage for 1.5 years, was to check water passage through the feed line inside of the BZh (from ZL1 connector to the buffer tank) and to check the response of the Electronics Unit's micro switches (signaling "Buffer Tank is Empty" & "Buffer Tank is Full".]*

FE-1 Kononenko performed routine IFM (Inflight Maintenance) on the second Russian SRVK condensate water processor by removing & replacing its BRPK-2 (Condensate Separation & Pumping Unit) separator.

Chamitoff completed the regular 30-day inspection of the new AED (Automated External Defibrillator) in the CHeCS (Crew Health Care Systems) rack. *[The AED is a portable electronic device that automatically diagnoses the potentially life threatening cardiac arrhythmias of ventricular fibrillation and ventricular tachycardia*

in a patient. It then can treat them through defibrillation, i.e., the application of electrical therapy which stops the arrhythmia, allowing the heart to reestablish an effective rhythm. AEDs are generally either held by trained personnel who will attend events or are public access units which can be found in places including corporate and government offices, shopping centers, airports, restaurants, casinos, hotels, sports stadiums, schools and universities, community centers, fitness centers, health clubs and any other location where people may congregate.]

Oleg Kononenko took the periodic readings of potentially harmful atmospheric contaminants in the Service Module (SM), using the CMS (Countermeasure System), a component of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, which uses preprogrammed microchips to measure H_2CO (Formaldehyde, methanal), CO (Carbon Monoxide) and NH_3 (Ammonia), taking one measurement per microchip. *[CMS is a subsystem of the Russian SKDS Pressure Control & Atmosphere Monitoring System.]*

Afterwards, the FE-2 conducted the periodic atmospheric sampling in the center of the Lab, SM and FGB with the GSC (Grab Sample Container), while Oleg, in parallel, used the AK-1M adsorber to collect cabin air samples in the SM and FGB.

Greg also took measurements for the regular atmospheric status check for $ppCO_2$ (Carbon Dioxide partial pressure) in the Lab, SM (at panel 449) and COL (Columbus Orbital Laboratory), using the hand-held CDMK (CO_2 Monitoring Kit, #1002). *[The battery pack is to be replaced with the one from unit #1009 if necessary.],*

Later, Chamitoff performed some troubleshooting on ANITA (Analyzing Interferometer for Ambient Air), checking on correct mating of cables, then powered up the ANITA hardware.

Volkov completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The FE-2 conducted the regular bi-monthly reboot of the OCA Router and File Server SSC (Station Support Computer) laptops.

At ~7:50pm, getting ready for sleep time, the CDR will again set up the Russian MBI-12 SONOKARD (Sonocard) payload and start his sixth experiment session,

using a sports shirt from the SONOKARD kit with a special device in the pocket for testing a new method for acquiring physiological data without using direct contact on the skin. Measurements are recorded on a data card for return to Earth.

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-1), TVIS treadmill (CDR, FE-1, FE-2), and RED resistive exercise device (FE-2). Later, Oleg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~5:50pm EDT, the ISS crew is scheduled for their regular weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[Private S/G-2 (Space-to-Ground 2) phone patch via SSC (Station Support Computer)]*.

WRM Update: An updated WRM (Water Recovery Management) "cue card" was uplinked overnight for the crew's reference in lieu of yesterday's uplink. *[The new card (17-0002S) lists 35 CWCs (Contingency Water Containers,~1356.0 L total) for the four types of water identified on board: technical water (578.9 L, for Elektron, flushing, hygiene, incl. 509.4 L non-usable water because of* Wautersia *bacteria), potable water (706.7 L, incl. 260.6 L currently on hold), condensate water (62.5 L), waste/EMU dump and other (7.9 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

BCC at MSFC: Last night, ground engineers conducted command & voice tests aimed at setting up BCC (Backup Control Center) capability at Marshall Space Flight Center/Huntsville.

VolSci Preview: For the weekend ahead, Gregory has selected another SHERE (Shear History Extensional Rheology Experiment) session in the MSG (Microgravity Science Glovebox) for the Voluntary Science program.

ATV1 Remaining O_2: After last Monday's (7/14) ISS cabin atmosphere repress with oxygen from ATV1 "Jules Verne", about 3.7 kg of O_2 remain in the supply ship's tank.

CEO (Crew Earth Observations) photo targets uplinked for today were **Iceberg A43f** (DYNAMIC EVENT: *(This large iceberg broke away from the Antarctic Ice Shelf near the Antarctic Peninsula over 18 months ago. It is now in the area just north of South Georgia Island. Conditions were marginal for viewing as the ISS*

pass was in the low light of winter during early afternoon. Clouds were expected to be broken to scattered. Approach was from the W. Looking just right of track for this high contrast feature in the darkness of the sea and using the long lens settings for detail), and **Polar Mesospheric Clouds (PMC)** over Northwestern Europe *(DYNAMIC EVENT: The nighttime window of opportunity for this pass ran for about 10-12 minutes from just SW of the Azores in the eastern North Atlantic to eastern Poland. These were high oblique views left of track towards the Earth's limb.)*

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:31am EDT [= epoch]):*
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Perigee height -- 337.7 km
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Eccentricity -- 0.000977
Solar Beta Angle -- 71.0 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 31 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55346

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/23/08 -- ATV1 reboost (~12:06pm EDT, ~4.1 m/sec delta-V)
08/30/08 -- Progress M-64/29P undocking, from FGB nadir
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
02/10/09 -- Progress M-67/32P launch

02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
03/25/09 -- Soyuz TMA-14/18S launch
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May '09)**
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/17/08
Date:	Thursday, July 17, 2008 12:48:03 PM
Attachments:	

ISS On-Orbit Status 07/17/08

All ISS systems continue to function nominally, except those noted previously or below.

Crew Sleep Cycle: After last night's sleeptime at 8:00pm EDT, wakeup today was at a more regular 4:30am, to extend again to 8:00pm tonight.

The CDR began the day by servicing the Russian BMP (Harmful Impurities Removal System), first terminating the regeneration cycle on filter bed #1 initiated yesterday, then starting the "bake-out"-to-vacuum cycle on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~5:20 EDT. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time done: 6/19&20).]*

Sergey Volkov & Oleg Kononenko then completed final post-EVA cleanup activities, by –

- Removing the O_2 repressurization tanks (BK-3, primary & backup) as well as batteries from the Orlan & BSS radio telemetry units (BRTA),
- Starting the discharge/recharge cycle on the first 825M3 battery pack from Orlan-M #25 in the ZU-S battery charger in the DC1 Docking Compartment, later tonight (~7:50pm) terminating it and initiating the process on the second 825M3 pack,
- Setting up both Orlan-M suits for airing/drying and later stowing them, plus
- Tagging up with ground specialists (at ~6:30am) for a final post-EVA debriefing.

FE-2 Chamitoff meanwhile had 1.5 hrs set aside for collecting and stowing the US

tools used in the two Russian EVAs.

In the DC1, Sergey conducted an inspection of areas behind panel 301 (equipment, connectors, shell) to check for any traces of coolant of the STR Thermal Control System.

The FE-2 completed the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WRM (Water Recovery & Management) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week. The current card (17-0002R) lists 35 CWCs (Contingency Water Containers,~1401.8 L total) for the four types of water identified on board: technical water (650.6 L, for Elektron, flushing, hygiene, incl. 509.4 L non-usable water because of* Wautersia *bacteria), potable water (706.7 L, incl. 260.6 L currently on hold), condensate water (41.5 L), waste/EMU dump and other (7.9 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

The FE-1 conducted the periodic (about twice a month) replenishing of the Elektron oxygen generator's water supply for electrolysis, filling the KOV EDV container with water collected in a CWC (Contingency Water Container) from the Lab CCAA (Common Cabin Air Assembly) dehumidifier. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron shutdown.]*

Gregory performed the periodic deployment of four passive FMK (Formaldehyde Monitoring Kit) sampling assemblies in the Lab (at P3, below CEVIS) and SM (at the most forward handrail, on panel 307) for two days, to catch any atmospheric formaldehyde on a collector substrate for subsequent analysis on the ground. *[Two monitors each are usually attached side by side, preferably in an orientation with their faces perpendicular to the direction of air flow.]*

Kononenko gathered the equipment necessary for tomorrow's planned periodic checkout of the spare BZh Liquid Unit (#056) for the Elektron O_2 generator,

[Objective of the checkout of the BZh, which has been in stowage for 1.5 years, is to check water passage through the feed line inside of the BZh (from ZL1 connector to the buffer tank) and to check the response of the Electronics Unit's micro switches (signaling "Buffer Tank is Empty" & "Buffer Tank is Full".]

The FE-1 completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities,*

replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]

Working from the Russian discretionary "time permitting" task list, Oleg also performed the daily IMS (Inventory Management System) maintenance, updating/ editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1). Later, Greg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~7:50pm EDT, just before sleep time, Oleg will again set up the Russian MBI-12 SONOKARD (Sonocard) payload and start his sixth experiment session, using a sports shirt from the SONOKARD kit with a special device in the pocket for testing a new method for acquiring physiological data without using direct contact on the skin. Measurements are recorded on a data card for return to Earth. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

As most every day, starting at ~9:00am this morning and running until 3:00pm, the US CDRA (Carbon Dioxide Removal Assembly) was activated intermittently for two half-cycles to control ppCO_2 levels. In this configuration for the daily ops, connecting & disconnecting the ITCS cooling loop is not required. *[A forward plan is in work for cycling the CSV (CO_2 Selector Valve) to prevent its sticking.]*

At ~7:55am, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU/*Glavnaya operativnaya gruppa upravleniya = "Main Operative Control Group"*), including Shift Flight Director (SRP), at TsUP-Moscow via S-band/audio, phone-patched from Houston and Moscow.

At ~8:00am, the crew downlinked a message of appreciation and greetings to a festive event at ESA Headquarters in Paris about ATV and ESA's ISS efforts, taking place during today's top-level HOA (Heads of Space Agencies) meeting. The footage shot by the crew earlier of the unveiling of original manuscripts by French author Jules Verne was also replayed at the event. *[For the video, produced on 7/7, a crewmember was shown entering the ATV and conducting a "tour" of the large vehicle, then making presentations of four historic items, namely an original copy of the 19th century of Jules Verne's book "De la Terre à la Lune" (From the Earth to the Moon), a Jules Verne poster showing three small original manuscripts, and a set of two original manuscripts within their protective plastic covers.]*

CEO (Crew Earth Observations) photo targets uplinked for today were **Iceberg A43f** (DYNAMIC EVENT: *(This large iceberg broke away from the Antarctic Ice Shelf near the Antarctic Peninsula over 18 months ago. It is now in the area just north of South Georgia Island. Conditions were marginal for viewing as the ISS pass was in the low light of winter during early afternoon. Clouds were expected to be broken to scattered. Approach was from the W. Looking just right of track for this high contrast feature in the darkness of the sea and using the long lens settings for detail), and* ***Polar Mesospheric Clouds (PMC)*** *over Northwestern Europe (DYNAMIC EVENT: The nighttime window of opportunity for this pass ran for about 10-12 minutes from just N of the eastern North Atlantic to northern Ukraine. These were to be high oblique views left of track towards the Earth's limb.)*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:13am EDT [= epoch]):*
Mean altitude -- 344.3 km
Apogee height -- 350.7 km
Perigee height -- 337.8 km
Period -- 91.42 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0009612
Solar Beta Angle -- 68.5 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 35 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55330

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/23/08 -- ATV1 reboost (~12:06pm EDT)
08/30/08 -- Progress M-64/29P undocking, from FGB nadir
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/

observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
03/25/09 -- Soyuz TMA-14/18S launch
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May ’09)**
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/16/08
Date:	Wednesday, July 16, 2008 12:06:33 PM
Attachments:	

ISS On-Orbit Status 07/16/08

All ISS systems continue to function nominally, except those noted previously or below. *Rest day for ISS.*

Crew Sleep Cycle: After this morning's sleeptime at 12:20am EDT, wakeup today was delayed to 9:50am. Bedtime tonight moves to a more "normal" 8:00pm for the rest of this week.

To provide cooling for today's ground-commanded re-activation of the U.S. CDRA (Carbon Dioxide Removal Assembly), FE-2 Chamitoff after wakeup connected the regular ITCS LTL (Internal Thermal Control System/Low Temperature Loop) coolant jumper connection to the CDRA support rack LAB1D6. The ground then lowered the temperature setpoint in Node-2 to control for humidity across the USOS. *[CDRA was activated at 1:25pm-7:25pm EDT to control ppCO_2 (CO_2 partial pressure) level.]*

Gregory reconfigured the POC (Portable Onboard Computer) laptops in the USOS from "uncrewed" to nominal OpsLAN operations, including NetMeeting and KFX (Ku-band File Transfer) functions. *[Reconfiguration activities included relocating the SSC-5 (Station Support Computer 5) A31p laptop back to its nominal location in the Lab and reconnecting it to power, plus relocating four A31p battery packs from the Soyuz spacecraft to the Lab for temporary stowage.]*

Greg's restoration activities also included –

- Transferring the FGB PCS (Portable Computer System) A31p laptop with cabling to the Lab Cupola RWS (Robotic Workstation) and connecting it, while stowing the RS (Russian Segment) DC power cable and A31p 28V DC power supply,
- Relocating the SSC-5 (Station Support Computer 5) laptop from the Soyuz SA (Descent Module) to the Lab, reconnecting it to power & Ethernet (ISL user cable) and powering on the "Cobalt brick" power unit,
- Turning off the PWS (Portable Workstation) laptops in the COL (Columbus

Orbital Laboratory),
- Activating the SLT (System Laptop) in the Kibo JEM (Japanese Experiment Module), Activation Activate SLT
- Opening remaining USOS hatches (JPM (JEM Pressurized Module) starboard & overhead, JLP (JEM Logistics Pressurized Segment) deck, COL, NODE-2 portside & starboard),
- Returning unused consumable and other items from Soyuz to the USOS.

CDR Sergey Volkov cleaned up after the EVA by returning the medical kits to their nominal stowage location and reconfiguring the REGUL-Packet communications link from Set 1 to Set 2.

In the Service Module (SM), Sergey completed the routine maintenance of the SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

The CDR performed the periodic service of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. Bed #2 regeneration follows tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time: 6/23&24).]*

Cleanup activities by FE-1 Oleg Kononenko consisted of –
- Taking post-EVA radiation readings of the "Pille-MKS" dosimeters carried by the spacewalkers in their Orlan suits,
- Downlinking EVA-20 digital photography,
- Activating the ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS/ALC) Spectrometer (AST), and
- Setting up 825M3 Orlan batteries for complete discharge/recharge.

Kononenko also spent a few minutes on the weekly inspection of the TVIS treadmill roller bearings, checking the treadmill's belt both left and right for any noticeable depressions due to seized or worn rollers. *[With the TVIS treadmill rollers approaching their end-of-life, the frequency of their inspection has recently been increased for safety.]*

Afterwards, Oleg completed closeout ops on the BIORISK-MSN payload which he

had brought in from EVA-20.

The two spacewalkers had their regular post-EVA PMCs (Private Medical Conferences) via Ku- & S-band audio/video, Sergey at ~4:15pm EDT, Oleg at ~4:50pm.

Gregory filled out the regular FFQ (Food Frequency Questionnaire), his fifth, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

The three crewmembers conducted an abbreviated physical workout program on the CEVIS cycle ergometer (FE-2) and TVIS treadmill (CDR, FE-1). Before sleeptime tonight, Oleg is to transfer the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week

Before sleeptime, FE-2 Chamitoff started out on his second session with the NASA SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment by initializing and donning an Actiwatch, using the HRF-1 (Human Research Facility 1) laptop. *[As other crewmembers before him, to monitor his sleep/wake patterns and light exposure, Gregory will be wearing the special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout this week, for the last time. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

S-band Forward Link Dropout: After crew ingress from EVA-20 and DC-1 repressurization, an unexpected loss of S-Band forward link (ground-to-ISS) impacted MCC-Houston's ability to command to ISS and to communicate with the crew (whose voices came through clearly). The S-Band loss was due to a misconfiguration in the ground network, but other means of informing the crew were available. After 45 minutes, communications were re-established OK.

CEO (Crew Earth Observations) photo targets uplinked for today were **Iceberg A43f** *(DYNAMIC EVENT: This large iceberg broke away from the Antarctic Ice Shelf near the Antarctic Peninsula over 18 months ago. It is now in the area just*

north of South Georgia Island. Conditions were marginal for viewing as the ISS pass was in the low light of winter at mid-afternoon. Clouds were expected to be broken to scattered. ISS approach was from the W. Looking well right of track for this high contrast feature in the darkness of the sea and using the long lens settings for detail), and **Polar Mesospheric Clouds (PMC)** over Northwestern Europe *(DYNAMIC EVENT: The ISS window of opportunity for this pass ran for about 10-12 minutes from just north of the Canary Islands to the eastern Ukraine. These were to be high oblique views left of track towards the Earth's limb).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:49am EDT [= epoch]):*
Mean altitude -- 344.3 km
Apogee height -- 350.7 km
Perigee height -- 337.9 km
Period -- 91.42 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0009467
Solar Beta Angle -- 65.3 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 45 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55314

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/18/08 -- ATV1 reboost
08/30/08 -- Progress M-64/29P undocking, from FGB nadir
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
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11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking

02/10/09 -- Progress M-67/32P launch
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02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/15/08
Date:	Tuesday, July 15, 2008 7:16:13 PM
Attachments:	

ISS On-Orbit Status 07/15/08

All ISS systems continue to function nominally, except those noted previously or below.

The Orlan spacewalk EVA-20 by CDR Volkov and FE-1 Kononenko from the DC1 (Docking Compartment) airlock lasted 5 hrs 54 min. All objectives were successfully achieved. The spacewalkers –

(1) Installed a new docking target on SM PkhO (Service Module Transfer Compartment) for zenith port docking of the new Russian MRM2 module (deferred from EVA-20A);
(2) Took post-installation photography of the new docking target;
(3) Inspected & photographed two mounting holes for an adapter of a Kurs antenna (4AO-VKA) on PkhO-RO (SM Working Compartment, small diameter section) for MLM;
(4) Transferred one "Yakor" foot restraint (of two) from the DC1 EVA ladder to the SM and installed it in an attachment socket at a PkhO handrail (two Yakors were installed on DC1 ladder during EVA-17A on 2/22/07);
(5) Installed the VSPLESK ("Burst") science payload (for studying cosmic radiation bursts) on a handrail at SM RO (large diameter section);
(6) Removed the BIORISK-MSN (BIO-2) experiment container 1 (of three) from the DC1 for return to the station (BIORISK-MSN, with three containers, was installed during EVA-19 on 6/6/07), plus
(7) Straightened out a bent amateur radio antenna (an impromptu add-on task).

The spacewalk began 6 min early, with EVA hatch open at 1:08pm EDT, and ended at 7:02pm. It was the 114th EVA in support of ISS assembly, outfitting & maintenance, with a total spacewalk time of 718 h 48 min, and the 86th EVA out of the ISS. Predicted radiation exposure for the EVA-20 crew was about 15 millirads.

To accommodate the spacewalk schedule, the crew's activity cycle was shifted for a

1h 20min earlier wakeup in the morning (4:10am EDT) and a 4h 50min delayed bedtime tonight (i.e., sleep tonight at 12:20am). Wakeup on Wednesday will be at 9:50am (extending to the more regular 8:00pm bedtime).

After morning inspection, all pre-EVA activities proceeded smoothly and on schedule, starting out with Volkov & Kononenko taking another MO-9 “Urolux” urine biochemistry test before breakfast. *[A second session with the Urolux equipment will be conducted by both crewmembers tonight (~7:40/7:55pm) immediately after post-EVA station repress.]*

FE-2 Chamitoff supported the preparations by installing fresh batteries in the cameras and transferring them over to the DC1, then configuring ISS systems for EVA.

Pre-EVA preparations by the crew included –

- Closing external covers on SM (Service Module) windows #8, #12, #13, #14,
- Deactivating the Kenwood-D700/Sputnik-SM amateur radio equipment to prevent RF interference with the Orlans’ wireless in-suit Tranzit-B radio telemetry system,
- Changing the settings of the DSP pressure alarm sensors in the RS (Russian Segment),
- Deactivating the DS-7A Smoke Detector #1 in the SM PkhO (Transfer Compartment),
- Setting up the PSS Caution & Warning System in the FGB,
- Deactivating the Vozdukh carbon dioxide (CO_2) removal system,
- Removing SM air ducts to enable RO-PkhO hatch closure,
- Deactivating VN1 & VN2 air heaters,
- Powering down ventilation fans in the SM (VK1, VK2, VK3, VK4, VKYu1, VKYu2),
- Turning off the SRVK-2M condensate water processor, and
- Powering off electrical food heaters in the SM galley.

In addition, CDR Volkov and FE-1 Kononenko had about an hour reserved to complete setting up DC1 (Docking Compartment) and PkhO systems for pre-EVA mode.

Next steps by Sergey & Oleg were to –

- Check out the Orlan-M spacesuits and their systems, as well as the suit interface control panels (BSS) in DC1 & PkhO,
- Retest the BK-3 primary & backup oxygen (O_2) tanks of the Orlans and DC1,
- Disassemble the DC1 air duct, but leaving the V3 fan in place, and
- Set up the STTS communications/telemetry links necessary for the

spacewalk from the DC1, including switching over the caution & warning system from the regular PSS console to the EVA support panel (POV). *[Most activities were paced by RGS (Russian ground site) comm window passes.]*

After a midday "snack" at ~8:30-9:10am, the spacewalkers conducted final inspections of the suits, BSS interface units & biomedical parameter telemetry to RGS (~9:50am), including VHF/voice & biomedical electrode belt and *telemetry hookups via the BSS (later by the wireless in-suit Tranzit-B radio telemetry system) for vital signs and equipment monitoring.

FE-2 Chamitoff configured the ISS for uncrewed ops. With FE-1 Kononenko, he prepared the Soyuz for his stay during the spacewalk. Gregory's preparations in the Descent Module (SA) included transfer of SOP (Food Supply Subsystem) food containers and a supply of eight Russian SVO (Water Supply System) water bags. *[These provisions would also have been needed in a contingency requiring the entire crew taking to the Soyuz for some time.]*

After entering the SA and closing the hatch between it and the BO (Orbital Module) at ~9:30am, Gregory performed a 30-min leak check on the hatch interface.

In the DC1 and PkhO, after the Orlan & BSS systems checkouts Volkov & Kononenko donned the spacesuits and ancillary gear at ~10:50am, assisting each other, then closed the hatchways between SM RO/PkhO (Working Compartment/ Transfer Compartment) and PkhO/SU (DC1 Transfer Vestibule) at ~12:40pm, keeping hatches open between FGB & PMA-1 (Pressurized Mating Adapter 1) and between SM & DC1.

At ~10:30am, ISS attitude control authority was handed over to RS MCS (Motion Control System) to keep attitude stable during the (reactive) DC1 airlock depressurization, and was returned to US momentum management by CMGs (Control Moment Gyroscopes) at ~1:50pm.

The spacewalkers sealed the Orlan backpacks (~11:20am), followed by Orlan & BSS controls checks. Final checkout of suits and their controls included checking for leak during successive stages of depressurization. *[Pressure inside the Orlans was reduced to 0.42 at (6.2 psi). After suit purge, the spacewalkers had a 30-minute oxygen prebreathe period, as pressures between DC-1 and the PkhO were equalized and then further reduced.]*

Gregory Chamitoff remained sealed off in the Soyuz SA during the spacewalk which began after a final leak check on the four BK-3 O_2 tanks. At end of prebreathe,

DC1 pressure was down to 15 mmHg (Torr), holding for 5 min for a final cabin leak check, followed by switching the Orlans to autonomous (battery) suit power and opening of EV hatch #1 at 1:08pm.

After return and ingress from the EVA, with DC1 airlock repressurization from SM cabin air, the crew opened hatches and reentered the SM for their second MO-9 “Urolux” biochemical urine test.

The FE-1 secured and stowed the returned BIORISK-MSN payload.

This was to be followed by the crew resetting communications, conducting ISS activation operations and restoring systems configurations in the DC1 and other RS modules to pre-EVA conditions, then installing the DC1 air ducts.

Chamitoff will return ISS systems to their initial states, including hatch opening (Node-1, Lab, A/L, Node-2) at ~9:20pm, installing air ducts, activating the Vozdukh CO_2 scrubber and the Sputnik-SM amateur radio, and turning around the DCS760 EVA camera.

Later in the night, Gregory will reconfigure the POC (Portable Onboard Computer) laptops in the USOS for nominal OpsLAN operations, including NetMeeting and KFX (Ku-band File Transfer) functions. *[Reconfiguration activities included relocating the SSC-5 (Station Support Computer 5) A31p laptop back to its nominal location in the Lab and reconnecting it to power, plus relocating four A31p battery packs from the Soyuz spacecraft to the Lab for temporary stowage.]*

Cleaning up after the spacewalk, CDR Volkov & FE-1 Kononenko will –

- Remove the Orlan BRTA radio/telemetry unit batteries,
- Take post-EVA radiation readings of the “Pille-MKS” dosimeters carried by the spacewalkers in their Orlan suits,
- Downlink EVA-20A digital photography,
- Activate the ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS/ALC) Spectrometer (AST), and
- Set up the 825M3 Orlan batteries for complete discharge/recharge, but
- Leave the backup BNP portable oxygen repressurization tank in DC1, since it will also be needed for EVA-20.

JPM GLAs Failures: JAXA’s Kibo JPM (JEM Pressurized Module) has 3 GLAs (General Luminaire Assemblies) failed. There are no spares on orbit. Work is underway to manifest new units. *[ULF-2 plan is to remove all LHAs (Lamp Housing Assemblies) from MPLM (Multipurpose Logistics Module) before undock.]*

CEO (Crew Earth Observations) photo targets uplinked for today were **Polar Mesospheric Clouds (PMC) over Far East Asia**, also known as Noctilucent Clouds *(the ISS nighttime pass opportunity tracked from the western North Pacific Ocean [just south of Japan] to the western Aleutian Islands [near the International Date Line] for about a ten-minute period. These were high oblique views left of track towards the Earth's limb)* and **Lake Poopo, Bolivia** *(Lake Poopo is a small lake near the southern end of a long, elevated basin in the Bolivian Andes known as the Altiplano. The Altiplano extends from the relatively moist region of Lake Titicaca south-southeastward to the large, bright playa of Salar de Uyuni. Poopo is subject to significant changes in size and color related to the El Nino-Southern Oscillation (ENSO) cycle. The ISS pass was in mid-morning and expected to be clear. Looking well right of track and trying for contextual views of the southern end of the Altiplano including Lake Poopo.)*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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Perigee height -- 337.9 km
Period -- 91.42 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0009557
Solar Beta Angle -- 61.2 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 57 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55299

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/18/08 -- ATV1 reboost
08/30/08 -- Progress M-64/29P undocking, from FGB nadir
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port)

10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
03/25/09 -- Soyuz TMA-14/18S launch
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May '09)**
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/14/08
Date:	Monday, July 14, 2008 12:01:41 PM
Attachments:	

ISS On-Orbit Status 07/14/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 13 of Increment 17.*

Crew Sleep Cycle: With wakeup this morning remaining at 5:30am EDT, sleeptime tonight is 7:30pm, i.e., 1.5 hrs earlier. This allows an earlier wakeup tomorrow morning, at 4:10am, to accommodate tomorrow's EVA-20 at ~1:14pm.

In preparation for tomorrow's Orlan EVA-20, Volkov & Kononenko conducted a 2h 40min review of specific spacewalk procedures and the timeline, supported by tagup with ground specialists via S-band. *[The spacewalk by Volkov (EV1) and Kononenko (EV2) from DC1, estimated at 5h 30 min duration, will begin at 1:14pm EDT (EV hatch opening, timed by RGS/Russian Ground Site acquisition) and last until an estimated ~6:45pm (hatch closing). After egress, the crew will experience four orbital nights, egressing on the first. Part of the EVA will be supported by the DC1-based GStM-1 "Strela-1" crane, operated via hand crank. EVA-20 objectives are:*

(1) Installation of a new docking target on SM PkhO (Service Module Transfer Compartment) for zenith port docking of the MLM (deferred from EVA-20A);
(2) Post-installation photography of the new docking target;
(3) Inspection of mounting holes for an adapter of a Kurs antenna (4AO-VKA) on PkhO-RO (SM Working Compartment, small diameter section) for MLM;
(4) Transferring one "Yakor" foot restraint (of two) from the DC1 EVA ladder to the SM and installing it in an attachment socket at a PkhO handrail (two Yakors were installed on DC1 ladder during EVA-17A on 2/22/07);
(5) Installing the VSPLESK ("Burst") science payload on a handrail at SM RO (large diameter section); and
(6) Removing the BIORISK-MSN (BIO-2) experiment container 1 (of three) from the DC1 for return to the station (BIORISK-MSN, with three containers,

was installed during EVA-19 on 6/6/07).
With FE-2 Chamitoff in the Soyuz Descent Module (SA), closing of hatches between PkhO & SM RO (Work Compartment) and between PkhO & DC1 will be at ~12:00pm, followed by suit donning, preliminary & final leak checks of suits, BSS and hatches, staged depressurization of DC1 with crew prebreathing, Orlan transition to autonomous battery power and EVA hatch opening at ~1:14pm for egress.]

In the Soyuz SA, Sergey Volkov made preparations for Gregory's stay by readying its ASU toilet facilities and preparing and placing procedural/informational radiograms.

In the DC1, the CDR configured CCPKs (Crew Contamination Protection Kits, Russian: PNST), intended to protect the spacewalkers from FORP (Fuel/Oxidizer Reaction Products, e.g., N-nitrosodimethylamine, NDMA), i.e., incompletely-burnt fuel residue on the SM hull from yaw/pitch thruster plumes. *[Protective gear kits for use during and after the EVA in case the Orlans are inadvertently contaminated, are extensively equipped with wet wipes, dry towels, goggles, IPK gas masks and half masks, latex gloves, high performance filters, trash containers, etc. The crew review today included detailed instructions what to do if any spacesuit contamination is detected after the EVA. Towels used for wiping gloves etc. will be thrown overboard in retrograde direction (i.e., against flight direction).]*

Chamitoff "turned around" the Kodak DCS 760 EVA camera by initiating charging two batteries for it and later configuring the camera for operation.

Meanwhile, OIeg retrieved three Russian "Pille-MKS" radiation dosimeters, recorded their dosages and equipped each Orlan (in pocket on left calf) with a radiation sensor (*A0309 & A0310)*. *[A third sensor, A0307, will be placed in the SM for background readings, and a fourth, A0308, is on standby. Also, Oleg transferred the ID-3 personal dosimeters, normally worn on the flight suit, to the chest pocket of the Orlan's lining (near the DIDB), later to be returned to the flight suits. After the EVA, readings from all dosimeters will be recorded and downlinked.]*

In the Soyuz SA, Volkov prepared the SOA Atmosphere Purification Unit for Greg by replacing the used P5 cartridge with a fresh cartridge (P4).

Kononenko also broke out and set up the equipment for tomorrow's planned "Urolux" biochemical urine test (PZE MO-9), readying the kit with fresh test strips in the ASU toilet facility. *[MO-9 is conducted regularly every 30 days (and also before and after EVAs) and is one of five nominal Russian medical tests adopted by NASA for US crewmembers for IMG (Integrated Medical Group) PHS evaluation as part of the "PHS/Without Blood Labs" exam. The analysis uses the sophisticated in-vitro*

diagnostic apparatus Urolux developed originally for the Mir program. The data are then entered in the Medical Equipment Computer (MEC)'s special IFEP software (In-Flight Examination Program).]

In preparation for the uncrewed period, the FE-1 later deactivated the AST Spectrometer of the Matryoshka-R (RBO-3-2) radiation payload. *[RBO-3-2 is using the ESA/RSC-Energia experiment ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS/ALC) with its Spectrometer (AST) and ALC equipment, temporarily located in the FGB on panel 429 (normally in DC1).]*

Greg Chamitoff had ~70 min set aside for unpacking & stowing cargo items delivered on STS-124/1J in their final ISS locations.

The FE-2 also set up two SONY PD100 camcorders in the Lab and Node-1 to provide situational awareness during the uncrewed period tomorrow (viewing only, not recording). *[To get the longest view, the cameras are "zoomed out" with a Wide Conversion lens attached. The camcorders were positioned to provide most the encompassing view of the modules, each one using one of the module power outlets.]*

The USB cameras on the Lab SSC (Station Support Computer) laptops were positioned such that areas not covered by the Lab PD100 video cam can be viewed from the ground.

To provide an SSC laptop for his stay in the Soyuz SA, Chamitoff powered off SSC-5 and its "cobalt brick" power supply for temporary transfer to the Soyuz spacecraft and also collected freshly charged batteries from four Lab SSC Clients for use in the Soyuz during the Russian EVA, replacing them in the laptops temporarily with stowed batteries.

Gregory also conducted another one of the periodic offloadings of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1054) with the collected water slated for processing. No samples were required. *[Estimated offload time before reaching the tank's neutral point (leaving ~6 kg in the tank): ~30 min. Condensate collection continues to be performed by the CCAA while the Russian SKV-2 air conditioner is off, awaiting its overdue Khladon (Freon-218) refill. SKV-1 has been nonfunctional for a long time.]*

Also in preparation for the spacewalk, the FE-2 closed the protective Lab science window shutter (to be verified closed prior to attitude control handover to RS thrusters tomorrow at ~10:30am).

With the U.S. CDRA (Carbon Dioxide Removal Assembly) deactivated by the ground this morning (~9:00am-3:00pm) and its cooling no longer required, Chamitoff demated and took down the ITCS LTL (Internal Thermal Control System/ Low Temperature Loop) jumper at the CDRA-supporting LAB1D6 rack.

The two spacewalkers will have their regular pre-EVA PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Sergey at ~2:25pm EDT, Oleg at ~2:40pm.

At ~11:40am, Gregory too had his regular PMC.

The FE-2 conducted today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1). Afterwards, Oleg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~1:00pm, Chamitoff will power up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, and power supply) and at 1:05pm conducted a ham radio exchange with the Department of Astronomy & Space Sciences (DASS) at the Kuwait Science Club.

At ~2:05pm, Sergey & Oleg are scheduled to support a PAO TV event by downlinking a message of greetings and well-wishing to the participants of the 2nd International Workshop-Conference Cosmotrans 2008 on Satellite Technologies for Rail Road Transportation, to take place in Moscow on 7/24. *[It is expected that almost 200 delegates representing Russian Railway limited partnership, Ministries of Transportation & Defense; Academy of Science, leading science, research, design and development institutions, production, and foreign companies will participate in the conference. Expected for the conference opening ceremony are S. B. Ivanov, Chairman of RF Government; A. N. Perminov, the Head of Roskosmos; A. V. Borodko, Head of Russian Cartography; V. I. Yakunin, President of Russian Rail Roads, and other VIPs. ISS crew: "…Greetings from Expedition 17 of the International Space Station! We are happy that the achievements in cosmonautics find practical application in the cutting edge development of such*

strategic industries as Russian rail road systems. Every time, when we watch our country's expanses from orbit, we can appreciate the importance of the rail road network in maintaining the integrity of Russia's economy by connecting the most remote areas, and the impact of its efficient operation on the country's economic development. We hope that space technologies-based GLONASS satellite navigation system, satellite communication, and Earth remote probing systems will have a profound impact on improving rail road transportation safety, improve passenger and cargo traffic control, and environmental protection measures.."]

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:37am EDT [= epoch]):*
Mean altitude -- 344.4 km
Apogee height -- 350.9 km
Perigee height -- 337.9 km
Period -- 91.42 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0009689
Solar Beta Angle -- 56.9 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 53 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55283

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/15/08 -- Russian EVA-20 (1:14pm)
07/18/08 -- ATV1 reboost
08/30/08 -- Progress M-64/29P undocking, from FGB nadir
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking

11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
03/25/09 -- Soyuz TMA-14/18S launch
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May '09)**
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/13/08
Date:	Sunday, July 13, 2008 1:00:56 PM
Attachments:	

ISS On-Orbit Status 07/13/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – light duty for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff. Ahead: Week 13 of Increment 17.*

Crew Sleep Cycle: Currently remaining at 5:30am – 9:00pm EDT.

After wakeup and before breakfast, FE-2 Chamitoff downloaded the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data from his Actiwatches to the HRF-1 (Human Research Facility 1) laptop. *[To monitor the crewmember's sleep/wake patterns and light exposure, crewmembers wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

Also upon wakeup, the FE-2 started the next part (3rd of 5) of the periodic acoustic measurement protocol by recording post-sleep data of the crew-worn acoustic dosimeters, later deploying the dosimeters statically (Part 4), one in the Node-2 and two the Kibo JPM (JEM Pressurized Module). Tonight (~5:55pm), Chamitoff will record the data taken by the three static dosimeters during the day (Part 5). *[Acoustic data must be taken twice per Increment, each time for the duration of the 16-hour crew workday.]*

CDR Volkov & FE-1 Kononenko spent most of their workday with equipment preparations in the DC1 "Pirs" Docking Compartment for the second Orlan EVA (#20) on 7/15.
After configuring the DC1 communications link to support their presence in "Pirs", Volkov & Kononenko today –

- Terminated the recharge process on the 825M3 Orlan battery in the ZU-S recharge unit,
- Prepared spacesuit replaceable elements, both individual and supplemental,

- Conducted pressure checks on the SM BK-3 oxygen (O_2) tanks and the BNP portable repress O_2 tank in the SM PkhO Service Module Transfer Compartment),
- Ran leak checks & valve functionality tests on the Orlans and their BSS interface/gas-liquid separation unit in the DC1 & PkhO from the EVA support panels (POV);
- Performed leak checking on the backup bladder of suit #27, and
- Installed US add-on gear on the Orlan #25,
- Prepared the BRTK electronic control system (with Central & Terminal Computer Systems check), and
- Checked out the Orlan & BSS systems, including the BRTA-1M comm/ telemetry units.

In the Lab, the FE-2 serviced the US OGS (Oxygen Generation System), removing the PWR (Payload Water Reservoir) from in front of the WDS (Water Delivery System) and replacing it with a filled PWR. *[Like the Russian Elektron, OGS produces O_2 from water by electrolysis, dumping the also generated H_2 (hydrogen) through venting.]*

Gregory also completed the periodic inspection of the SPS ELPS (Secondary Power System/Emergency Lighting & Power Supply) subsystems in Node-2, A/L (US Airlock), Lab, and Node-1. *[This activity, now hard scheduled, was suggested yesterday on the US discretionary "job jar" task list.]*

For today's workouts by all crewmembers on the RED (Resistive Exercise Device), Chamitoff set up the video camcorder for filming and recording the sessions via ground commanding. Afterwards, the video equipment was put back in stowage, and the video was to be downlinked from the VTR (Video Tape Recorder) by ground commanding. *[The RED video, showing the apparatus on the "ceiling" hatch of the Node, is periodically required to support biomechanical evaluation of the exercising crewmember and assessment of the on-orbit setup of equipment during data collection.*

Greg conducted today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Working off the Russian discretionary "time permitting" task list, Oleg took care of the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Chamitoff completed the regular monthly & quarterly maintenance of the TVIS (Treadmill with Vibration Isolation & Stabilization), inspecting the condition of harnesses, belt slats, corner bracket ropes, IRBAs (Isolation Restorative Bungee Assemblies) and gyroscope wire ropes for any damage or defects, lubricating as required plus recording time & date values.

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

At ~5:35pm EDT, Volkov & Kononenko will support a Russian PAO TV event by downlinking a message of greetings and well-wishing for replay at the grand opening of a new administration building of the Korolev Traffic Police on 7/15 in the City of Korolev, in the presence of Russian Interior Ministry officials; B. V. Gromov, the Governor of the Moscow region; N. V. Golovkin, the Head of Traffic Police in the Moscow Region; and A. F. Morozenko, the Mayor of Korolev.

At ~6:45pm, the FE-2 is scheduled for his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this “Gateway” website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/15/08 -- Russian EVA-20 (1:14pm)
07/18/08 -- ATV1 reboost
08/30/08 -- Progress M-64/29P undocking, from FGB nadir
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)

11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
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11/20/08 -- **ISS 10 Years**
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11/28/08 -- Progress M-66/31P docking
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05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May '09)**
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12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/12/08
Date:	Saturday, July 12, 2008 11:24:37 AM
Attachments:	

ISS On-Orbit Status 07/12/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday.*

Crew Sleep Cycle: Currently remaining at 5:30am – 9:00pm EDT.

After wakeup and before breakfast, FE-2 Chamitoff downloaded the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data from his Actiwatches to the HRF-1 (Human Research Facility 1) laptop. *[To monitor the crewmember's sleep/wake patterns and light exposure, crewmembers wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

Before breakfast, Gregory began Part 1 (of 5) of the periodic acoustic measurement protocol by deploying crew-worn acoustic dosimeters, to be carried for 24 hours (with a microphone on the shirt collar). (Last time done: 4/1 – the session with Malenchenko on 4/13 failed). *[Tonight, after about 15 hours of measurements, dosimeter data will be downloaded and the hardware power-cycled for another data take starting tonight after 8.5-hr. sleep. At that point, the crew will deploy the dosimeters statically in the station for the duration of the day, record measurements tomorrow noon and stow the instruments. Acoustic data must be taken twice per Increment, each time for the duration of the 16-hour crew workday.]*

CDR Volkov and FE-1 Kononenko completed final post-EVA cleanup activities, starting the discharge/recharge cycle on the 825M3 battery from Orlan-M #25 in the ZU-S battery charger in the DC1 Docking Compartment, refilling the Orlan feedwater reservoirs (for cooling), setting up both Orlan-M suits for airing/drying, and tagging up with ground specialists on S/G-1-audio to discuss the spacewalk at ~7:45am EDT.

After running his first NOA-2/Nitric Oxide Analyzer (MBI-21) session on 7/10, measuring post-EVA NO (Nitric Oxide) in his exhaled air, Kononenko today closed out the experiment, filling in the electronic log book on the RSE1 laptop, downlinking images to TsUP via OCA, copying photos to the RSK1 laptop hard drive for return, and restowed the hardware.

FE-2 Chamitoff performed the periodic inspection & cleaning of the FDS (Fire Detection & Suppression) system's bacteria filters and SDs (smoke detectors) in the US Airlock (one SD), Node-1 (2 SDs), Lab (2 SDs), and Node-2 (2 SDs).

Gregory also completed the periodic (monthly) inspection of the RED (Resistive Exercise Device) canister cords and accessories.

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1. Later, Gregory transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Oleg conducted today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Sergey completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The two cosmonauts had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Sergey at ~9:15am, Oleg at ~11:00am.

Suggested on the US "job jar" task list for Gregory Chamitoff's discretionary performance is the periodic inspection of the ELPS (Emergency Lighting & Power Supply) subsystems in Node-2, A/L (US Airlock), Lab, and Node-1, to become hard-scheduled tomorrow.

WRM Update: An updated WRM (Water Recovery Management) "cue card" was uplinked overnight for the crew's reference in lieu of yesterday's uplink. *[The new card (17-0002R) lists 35 CWCs (Contingency Water Containers,~1401.8 L total) for*

the four types of water identified on board: technical water (650.6 L, for Elektron, flushing, hygiene, incl. 509.4 L non-usable water because of Wautersia bacteria), potable water (706.7 L, incl. 260.6 L currently on hold), condensate water (41.5 L), waste/EMU dump and other (7.9 L). Wautersia bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]

Weekly Science Update *(Expedition Seventeen -- Week 12)*

3-D SPACE : Planned (3 sessions in Inc-17, 1 in Inc-18)

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Measurements continue in FGB module. Last memory card exchange was performed on 7/1.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): The Silicate Garden Hab ground unit was activated successfully yesterday at the Univ. of Colorado. CGBA-5 will be powered up and the Silicate Garden Hab flight unit will be activated on Monday, 7/14.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): The experiment platform continues to operate nominally. A DHPU (Data Handling Processing Unit) software patch is currently being developed to fix the link error issues encountered with DEBIE-2 and FIPEX instruments. - DEBIE-2: Link error still in work. However a work-around allows for regular science data acquisition using an on-board IOP (Instrument Operations Procedure), but not yet in conjunction with any FIPEX IOP – a final software patch, which will enhance the present instrument capabilities, is under finalization on ground; - DOSTEL**:** On-going science acquisition; - EuTEMP**:** Currently inactive as planned; - EVC: Several successful ground commanded runs. Some nice pictures of Earth at sunset and sunset could be obtained. In full Sun illumination, the EVC sensor seems to saturate and consequently the picture quality is not optimum; - EXPOSE: On-going science acquisition; - FIPEX: Science script was running nominally until 6/28, when a sudden sensor switch off was encountered. It is a known problem, under assessment. Currently up and running; - MEDET: Some commandings were performed to adjust the frequency of acquisition of the microcalorimeter. Continuously acquiring science data; - PLEGPAY**:** currently in READY mode, no science data acquisition on-going; - TRIBOLAB: The Ball-Bearing experiment 1/2/3 which is running since 6/16 has been paused during the EUTEF power-down on 6/21 and has been resumed since. On 6/25, the experiment went suddenly to Non-Nominal Mode, after some higher than expected currents have been measured with the motor. On 6/30, the instrument was put in Thermal Stabilization Mode, and the Ball-Bearing experiment 1/2/3 was restarted on 7/1. This experiment run is expected to last until Week #14.

FSL (Fluid Science Laboratory): FSL is back and running. Further FSL commissioning activities remain to be done (see following item).

GEOFLOW: Commissioning activities for FSL have been continued successfully with the FSL RIC and FSL VMU S/W upgrades on 07/3. On 07/4, the Optical Check-out 1 was also successfully completed. In the near future, the crew will swap the optical target, stand-by until further optical modes checks, and then GEOFLOW Experiment Container will be inserted to start GEOFLOW science runs in the near future.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Planned.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer, ESA): Measurements for NOA-2 by the two Russian cosmonauts were successfully completed before (7/9) and after (7/11) the Russian EVA-20A.

NUTRITION w/REPOSITORY: “Greg, thank you for your continued support of the Nutrition experiment objectives during the FD30 session. We appreciate all of the barcode information relayed via crew notes.”

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): In progress.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): In progress.

SOLAR (Solar Monitoring Observatory): In progress.

SOLO: Planned.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): The four ECs (Experiment Containers) of Rotor B are yet to be retrieved by the crew from the blocked Rotor B. BIOLAB could not be activated from ground yet, pending resolution of the Smoke Detector issue. A troubleshooting plan has been developed to recover all the BIOLAB functionalities. The remaining WAICO-#1 ECs will be disposed and replaced by six Reference ECs on Rotor B.

CEO (Crew Earth Observations): Through 7/9 the ground has received a total of 2,862 CEO images for review and cataloging. CEO now has a backlog to review of imagery with camera times corresponding to the target request times that include: Central-Arizona Phoenix; Barringer Impact Crater; the Karakoram; Mt. Rainier, Vesuvius, and Etna; the Ganges River Delta; Red River Basin; Santa Barbara Coast; and S. Mozambique. "You have been providing an excellent response to our requests and we will be providing feedback on your success with these and other targets in the coming days. This week's highlights include your timely imagery of the Big Sur Fire in California and your excellent views of Hurricane Bertha in the Atlantic. The former have been published on NASA/GSFC's Earth Observatory website while the latter have been captioned for use by PAO."

CEO photo targets uplinked for today were **Jarvis Island, equatorial Pacific** *(this unusual, trapezoid-shaped island is located just south of the equator about halfway between Hawaii and the Cook Islands. It is low-lying, uninhabited, has very little vegetation and is just about 2 miles long and 1 mile wide. CEO is supporting international efforts to document and monitor the Earth's coral reef systems. On this mid-morning pass, Greg was to look left of track for this target. Then use the long lens settings for detailed views of the fringing coral reefs, especially those on the eastern side),* and **Moorea Coral Reef, Tahiti** *(Moorea is a beautiful, mountainous, and heart-shaped island in French Polynesia. It is part of the Society Islands and located 17 km NW of Tahiti. The island has a striking set of fringing coral reefs. Looking for this island to the right of track as ISS approached the larger island of Tahiti from the NW in mid-morning light, using the long lens settings to carefully map the coral reef structures.)*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 4:59am EDT [= epoch]):*
Mean altitude -- 344.5 km
Apogee height -- 350.8 km
Perigee height -- 338.2 km
Period -- 91.43 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0009317
Solar Beta Angle -- 47.8 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 20 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55249

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/15/08 -- Russian EVA-20 (1:14pm)
07/18/08 -- ATV1 reboost
08/30/08 -- Progress M-64/29P undocking, from FGB nadir
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
03/25/09 -- Soyuz TMA-14/18S launch
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May ’09)**
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1

05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/11/08
Date:	Friday, July 11, 2008 12:06:29 PM
Attachments:	

ISS On-Orbit Status 07/11/08

All ISS systems continue to function nominally, except those noted previously or below.

Crew Sleep Cycle: After the late post-EVA sleeptime this morning night (2:10am EDT), crew wakeup today was delayed to 11:40am;l sleeptime: 9:00pm EDT.

After wakeup and before breakfast, FE-2 Chamitoff downloaded the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data from his Actiwatches to the HRF-1 (Human Research Facility 1) laptop. *[To monitor the crewmember's sleep/wake patterns and light exposure, crewmembers wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

Later, Gregory reconfigured the POC (Portable Onboard Computer) laptops in the USOS for nominal OpsLAN operations, including NetMeeting and KFX (Ku-band File Transfer) functions. *[Reconfiguration activities included relocating the SSC-13 (Station Support Computer 13) back to its nominal location in the Lab and reconnecting it to power, plus relocating four A31p battery packs from the Soyuz spacecraft to the Lab for temporary stowage.]*

Cleaning up after the spacewalk, CDR Volkov & FE-1 Kononenko will –

- Remove the BK-3 portable oxygen repressurization tanks (primary & backup) from the DC1 BSS (Orlan Interface Unit),
- Remove the Orlan BRTA radio/telemetry unit batteries,
- Take post-EVA radiation readings of the "Pille-MKS" dosimeters carried by the spacewalkers in their Orlan suits,
- Downlink EVA-20A digital photography,
- Activate the ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS/ALC) Spectrometer (AST), and

- Set up the first 825M3 Orlan battery for complete discharge/recharge.

Both spacewalkers are timelined for their standard post-EVA PMCs (Private Medical Conferences) via S-band/audio, Oleg at 4:35pm, Sergey at 4:50pm.

Greg Chamitoff will tag up with EVA debriefers at MCC-Houston at ~5:15pm via S/G audio.

Oleg Kononenko is scheduled for taking the periodic readings of potentially harmful atmospheric contaminants in the Service Module (SM), using the CMS (Countermeasure System), a component of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, which uses preprogrammed microchips to measure H_2CO (Formaldehyde, methanal), CO (Carbon Monoxide) and NH_3 (Ammonia), taking one measurement per microchip. *[CMS is a subsystem of the Russian SKDS Pressure Control & Atmosphere Monitoring System.]*

The FE-2 has the weekly 10-min. CWC (Contingency Water Container) audit on his schedule, as part of on-going WRM (Water Recovery & Management) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week. The current card (17-0002Q) lists 35 CWCs (Contingency Water Containers,~1365.2 L total) for the four types of water identified on board: technical water (650.6 L, for Elektron, flushing, hygiene, incl. 509.4 L non-usable water because of Wautersia bacteria), potable water (706.7 L, incl. 260.6 L currently on hold), condensate water (4.9 L), waste/EMU dump and other (7.9 L). Wautersia bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

The CDR is scheduled to conduct the periodic (about twice a month) replenishing of the Elektron oxygen generator's water supply for electrolysis, filling the KOV EDV container with water collected in a CWC (Contingency Water Container) from the Lab CCAA (Common Cabin Air Assembly) dehumidifier. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron shutdown. With both Russian SKV air conditioners still not functioning, condensate is being produced (from air humidity) solely by the CCAA.]*

Kononenko later performs the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Gregory will work on the US OGS (Oxygen Generation System), to set it up for activation. *[Activities include installation of a WW (Waste Water) check valve at the OGS UIP (LAB1P1), accessing the OGS rack front and mating the O_2 outlet jumper QD (Quick Disconnect) at the N_2 Purge ORU (Orbit Replaceable Unit, LAB1PD1 panel), then performing an N_2 (nitrogen) purge of the H_2 (hydrogen) sensor, letting the OGA (Oxygen Generation Assembly) powered for ~20 min. Afterwards, the H_2 sensor QDs are reconnected, the rack door closed, and the WDS (Water Delivery System) re-attached and activated.]*

Other activities scheduled for FE-2 Chamitoff today are to –

- Reconfigure the flexible "elephant" air duct in the US Airlock (A/L), with the A/L CCAA (Common Cabin Air Assembly) air conditioner deactivated, to its nominal post-US EVA configuration at the IMV (Intermodular Ventilation) air return port,
- Turn off the ANITA (Analyzing Interferometer for Ambient Air) hardware, terminating its sampling mode, exiting ANITA software and powering down its laptop in support of subsequent ER4 (EXPRESS Rack 4) repair,
- Perform maintenance on ER4 (EXPRESS Rack 4) by replacing failed power indicators in Lockers 7 & 8, placing the defective light bulbs in a Ziploc bag and CTB for return,
- Take measurements for the regular atmospheric status check for $ppCO_2$ (Carbon Dioxide partial pressure) in the Lab, SM (at panel 449) and COL (Columbus Orbital Laboratory), using the hand-held CDMK (CO_2 Monitoring Kit, #1002). *[The battery pack is to be replaced with the one from unit #1009 if necessary.],* and
- Fill out the regular FFQ (Food Frequency Questionnaire), his fourth, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

A new task item on Greg's discretionary "job jar" list is the periodic inspection & cleaning of the FDS (Fire Detection & Suppression) system's bacteria filters and SDs (smoke detectors) in the Lab, Node-1, and Node-2.

The crew today performs a reduced physical exercise program on the CEVIS cycle ergometer (FE-2), TVIS treadmill (FE-1) and VELO bike with bungee cord load trainer (CDR).

CEO (Crew Earth Observations) photo targets uplinked for today were **Polar Mesospheric Clouds (PMC)**, also known as Noctilucent Clouds. *(These are transient, upper atmospheric phenomena which are only observed in the summer season at higher latitudes (greater than 35 degrees). Furthermore, they are only visible under special lighting conditions when the observer is in darkness and the sun is 10 to 35 degrees below the horizon. Because of their transient nature and the fact that their presence is almost impossible to predict, researchers consider PMC's to be a DYNAMIC EVENT of opportunity. They are phenomena that we are documenting from the ISS in support of the International Polar Year (IPY). These are very subtle features and sometimes can only be confirmed with image enhancement.)*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 10:32am EDT [= epoch]):*
Mean altitude -- 344.5 km
Apogee height -- 350.7 km
Perigee height -- 338.4 km
Period -- 91.43 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0009145
Solar Beta Angle -- 43.1 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours – negligible due to EVA-20A
Revolutions since FGB/Zarya launch (Nov. 98) -- 55237

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/15/08 -- Russian EVA-20 (1:14pm)
07/18/08 -- ATV1 reboost
08/30/08 -- Progress M-64/29P undocking, from FGB nadir
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)

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03/25/09 -- Soyuz TMA-14/18S launch
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May '09)**
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/10/08
Date:	Thursday, July 10, 2008 9:17:40 PM
Attachments:	

ISS On-Orbit Status 07/10/08

All ISS systems continue to function nominally, except those noted previously or below.

The Orlan spacewalk EVA-20A by CDR Volkov and FE-1 Kononenko from the DC1 (Docking Compartment) airlock lasted 6 hrs 18 min. For both it was the first EVA. The main objective of the spacewalk, the first time for both of them, was successfully achieved: The spacewalkers –

- inspected the Soyuz TMA-12 spacecraft at its first separation plane (Plane I),
- removed a section of thermal insulation,
- cut a wire tie connecting pyrobolts, and at 6:44pm EDT
- removed one pyrobolt (of two) from one (#5) of the five locks which tie der Instrumentation & Propulsion Module to the Descent Module (SA) *[the removal functionally opened the latch lock, which apparently had failed twice before on Soyuz reentries 11S and 10S]*, and
- secured the pyrobolt inside a blast proof container for returning it onboard and then to Earth aboard Soyuz 16S in October.

The second planned task of installing a docking target for the new Russian MRM (Multipurpose Research Module) on the SM PkhO (Service Module Transfer Compartment) for docking at the SM zenith port was moved to EVA-20 next Tuesday (7/15).

The spacewalk began 30 minutes late, with EVA hatch open at 2:48pm EDT, ending at 9:06pm. It was the 113th EVA in support of ISS assembly, outfitting & maintenance, with a total spacewalk time of 712 h 54 min, and the 85th EVA out of the ISS.

To accommodate the spacewalk schedule, the crew's activity cycle was shifted for a 10 min earlier wakeup in the morning (5:20am EDT) and a 5h 20min delayed

bedtime tonight (i.e., sleep tomorrow morning at 2:10am). Wakeup tomorrow will be at 11:40am (extending to the more regular 9:00pm bedtime).

Before breakfast, FE-2 Chamitoff started his day again with the week-long SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment, using the payload software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop. *[To monitor the crewmember's sleep/wake patterns and light exposure, Greg wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list. This is Week 1 of 3 for the FE-2.]*

After morning inspection, all pre-EVA activities proceeded smoothly and on schedule, starting out with Volkov & Kononenko taking another MO-9 "Urolux" urine biochemistry test before breakfast. *[A second session with the Urolux equipment will be conducted by both crewmembers tonight (~9:15pm) immediately after post-EVA station repress.]*

FE-2 Chamitoff supported the preparations by installing fresh batteries in the cameras and transfer them over to the DC1, then configuring ISS systems for EVA.

Pre-EVA preparations by the crew included –

- Closing external covers on SM (Service Module) windows #8, #12, #13, #14,
- Deactivating the Kenwood-D700/Sputnik-SM amateur radio equipment to prevent RF interference with the Orlans' wireless in-suit Tranzit-B radio telemetry system,
- Changing the settings of the DSP pressure alarm sensors in the RS (Russian Segment),
- Deactivating the DS-7A Smoke Detector #1 in the SM PkhO (Transfer Compartment),
- Setting up the PSS Caution & Warning System in the FGB,
- Deactivating the Vozdukh carbon dioxide (CO_2) removal system,
- Removing SM air ducts to enable RO-PkhO hatch closure,
- Deactivating VN1 & VN2 air heaters,
- Powering down ventilation fans in the SM (VK1, VK2, VK3, VK4, VKYu1, VKYu2),
- Turning off the SRVK-2M condensate water processor, and
- Powering off electrical food heaters in the SM galley.

CDR Volkov and FE-1 Kononenko had about an hour reserved to complete setting up DC1 and PkhO systems for pre-EVA mode.

To monitor their work area at the Soyuz TMA-12 during the spacewalk, the CDR set up the SONY HDV high-resolution camcorder (HRV-Z1J, from SFP Charles Simonyi) at SM window #6 and arranged a portable fan from FGB stowage to provide cooling to the camcorder body during operation.

Next steps by Sergey & Oleg were to –

- Check out the Orlan-M spacesuits and their systems as well as the suit interface control panels (BSS) in DC1 & PkhO,
- Retest the BK-3 primary & backup oxygen (O_2) tanks of the Orlans and DC1,
- Disassemble the DC1 air duct, but leaving the V3 fan in place, and
- Set up the STTS communications/telemetry links necessary for the spacewalk from the DC1. *[Most activities were paced by RGS (Russian ground site) comm window passes.]*

After a midday "snack" (9:40-10:20am), the spacewalkers conducted final inspection of the suits, BSS interface units & biomedical parameter telemetry to RGS (~11:00am), including VHF/voice & biomedical electrode belt and telemetry hookups via the BSS (later by the wireless in-suit Tranzit-B radio telemetry system) for vital signs and equipment monitoring.

FE-2 Chamitoff configured the ISS for uncrewed ops and, with FE-1 Kononenko, prepared the Soyuz for his stay during the spacewalk. Gregory's preparations in the Descent Module (SA) included transfer of SOP (Food Supply Subsystem) food containers and a supply of eight Russian SVO (Water Supply System) water bags. *[These provisions would also have been needed in a contingency requiring the entire crew taking to the Soyuz for some time.]*

After entering the SA and closing the hatch between it and the BO (Orbital Module) at ~10:45am, Gregory performed a 30-min leak check on the hatch interface, then settled down for the six-hour lockout.

In the DC1 & PkhO, after the Orlan & BSS systems checkouts Volkov & Kononenko donned spacesuits and ancillary gear at ~12:10pm, assisting each other, then closed the hatchways between SM RO/PkhO (Working Compartment/Transfer Compartment) and PkhO/SU (DC1 Transfer Vestibule) at ~12:40pm, keeping hatches open between FGB & PMA-1 (Pressurized Mating Adapter 1) and between SM & DC1.

At ~11:50am, ISS attitude control authority was handed over to RS MCS (Motion Control System) to keep attitude stable during the (reactive) DC1 airlock depressurization, and was returned to US momentum management by CMGs

(Control Moment Gyroscopes) at ~2:50pm.

The spacewalkers sealed the Orlan backpacks (~12:30pm), followed by Orlan & BSS controls checks. Final checkout of suits and their controls included checking for leak during successive stages of depressurization. *[Pressure inside the Orlans was reduced to 0.42 at (6.2 psi). After suit purge, the spacewalkers had a 30-minute oxygen prebreathe period, as pressures between DC-1 and the PkhO were equalized and then further reduced.]*

Gregory Chamitoff remained sealed off in the Soyuz SA during the spacewalk which began after a final leak check on the four BK-3 O_2 tanks. At end of prebreathe, DC1 pressure was down to 15 mmHg (Torr), holding for 5 min for a final cabin leak check, followed by switching the Orlans to autonomous (battery) suit power (~2:15pm) and opening of EV hatch #1 at 2:48pm.

After return and ingress from the EVA, with DC1 airlock repressurization from SM cabin air, the crew opened hatches and reentered the SM for their second MO-9 "Urolux" biochemical urine test.

Later, the CDR & FE-1 will have their scheduled post-EVA data take with the NOA/ Nitric Oxide Analyzer (MBI-21) experiment (Sergey's fourth, Oleg's third), filling in the electronic log book on the RSE1 laptop for downlink and restowing the hardware. Each subject takes two NO (Nitric Oxide) measurements in exhaled air. *[Purpose of the ESA experiment ESANO1, consisting of the "Platon" analyzer and its power supply, is to monitor expired NO in the subject's exhaled air to detect signs of airway inflammation and indications of venous gas emboli (bubbles) that may be caused by inhalation of pollutants in the closed environment of the ISS cabin and increased risk of decompression sickness.]*

This will be followed by the crew resetting communications, conducting ISS activation operations and restoring systems configurations in the DC1 and other RS modules to pre-EVA conditions, then installing the DC1 air ducts.

Cleaning up after the spacewalk, CDR Volkov & FE-1 Kononenko will –

- Remove the Orlan BRTA radio/telemetry unit batteries,
- Take post-EVA radiation readings of the "Pille-MKS" dosimeters carried by the spacewalkers in their Orlan suits,
- Downlink EVA-20A digital photography,
- Activate the ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS/ALC) Spectrometer (AST), and
- Set up the 825M3 Orlan batteries for complete discharge/recharge, but

- Leave the backup BNP portable oxygen repressurization tank in DC1, since it will also be needed for EVA-20.

Chamitoff will return ISS systems to their initial states, including hatch opening (Node-1, Lab) at ~11:05pm, air ducts, Vozdukh CO_2 scrubber and Sputnik-SM amateur radio.

Later in the night, Gregory will reconfigure the POC (Portable Onboard Computer) laptops in the USOS for nominal OpsLAN operations, including NetMeeting and KFX (Ku-band File Transfer) functions. *[Reconfiguration activities included relocating the SSC-5 (Station Support Computer 5) A31p laptop back to its nominal location in the Lab and reconnecting it to power, plus relocating four A31p battery packs from the Soyuz spacecraft to the Lab for temporary stowage.]*

To provide cooling for tomorrow's ground-commanded activation of the U.S. CDRA (Carbon Dioxide Removal Assembly), shortly before sleeptime the FE-2 will connect the regular ITCS LTL (Internal Thermal Control System/Low Temperature Loop) coolant jumper connection to the CDRA support rack LAB1D6. The ground will then lower the temperature setpoint in Node-2 to control for humidity across the USOS. *[CDRA will be activated tomorrow at 9:00am-3:00pm EDT to reduce cabin CO_2 levels.]*

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:40am EDT [= epoch]):*
Mean altitude -- 344.5 km
Apogee height -- 350.7 km
Perigee height -- 338.4 km
Period -- 91.43 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.000908
Solar Beta Angle -- 38.3 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 35 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55220

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/15/08 -- Russian EVA-20 (1:14pm)

07/18/08 -- ATV1 reboost
08/30/08 -- Progress M-64/29P undocking, from FGB nadir
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
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03/25/09 -- Soyuz TMA-14/18S launch
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07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
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12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/09/08
Date:	Wednesday, July 09, 2008 1:18:48 PM
Attachments:	

ISS On-Orbit Status 07/09/08

All ISS systems continue to function nominally, except those noted previously or below.

Crew Sleep Cycle: With wakeup this morning remaining at 5:30am EDT, sleeptime is beginning to move left, tonight at 8:50pm, i.e., 10 min earlier. Wakeup tomorrow will also be 10 min earlier, at 5:20am.

FE-2 Chamitoff started his day again with the week-long SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment, using the payload software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop. *[To monitor the crewmember's sleep/ wake patterns and light exposure, Greg wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list. This is Week 1 of 3 for the FE-2.]*

In preparation for tomorrow's Orlan EVA-20A, CDR Volkov & FE-1 Kononenko began their day by tagging up with ground specialists via S-band to review an updated EVA timeline. *[The Orlan spacewalk by Sergey/EV1 & Oleg/EV2, now estimated at 6hrs 10min, will begin with DC1 (Docking Compartment)* ***hatch opening at 2:18pm EDT*** *(ingress & hatch close at ~8:22pm). The spacewalkers will experience three orbital "nights", during which they will rest, and a fourth during their ingress. EVA-20A objectives are: (1) Inspection & mechanical unlatching of one of five locks on Plane I of the Soyuz TMA-12 spacecraft, followed by removal of one of the two pyrobolts (8Kh55) from inside the lock body, (2) installation of the docking target unit for the new Russian research module on the SM PkhO (Service Module/Transfer Compartment), Plane 4, for the zenith (upward facing) docking port. During the EVA, the protective thruster covers & wipes/towels will be jettisoned from the Soyuz in carefully prescribed zones to prevent later recontact.]*

After the timeline review, CDR Volkov was to –

- Make preparations for Gregory Chamitoff's stay in the Soyuz Descent Module (SA) by placing instructional/reference material (radiograms) in the SA and readying its ASU toilet facility,
- Support an automatic closure test of the hatch cover between the DC1 Docking Compartment and its transfer vestibule (SU) to the Soyuz, with the DC1 & Soyuz air ducts (VD2 & VD) temporarily moved out of the way *[the hatch closure was ground commanded during an RGS (Russian Ground Site) comm window],*
- Configure CCPKs (Crew Contamination Protection Kits, Russian: PNST) in the DC1, for protecting the spacewalkers from FORP (Fuel/Oxidizer Reaction Products, e.g., N-nitrosodimethylamine, NDMA), i.e., incompletely-burnt fuel residue on the SM hull from yaw/pitch thruster plumes *[protective gear kits for use during and after the EVA in case the Orlans are inadvertently contaminated, are extensively equipped with wet wipes, dry towels, goggles, IPK gas masks and half masks, latex gloves, high performance filters, trash containers, etc. The crew review today included detailed instructions what to do if any spacesuit contamination is detected after the EVA. Towels used for wiping gloves etc. will be thrown overboard in retrograde direction (i.e., against flight direction)],* and
- Conduct a functional test of the KSD Pressure Relief Valve (PRV) in the+ Soyuz BO (Orbital Module) from the DC1 EVA panel (POV).

FE-1 Kononenko's preparatory activities meanwhile include –

- Conducting a pressure check on the BNP portable repress O_2 tank in the DC-1, to be used for repressurization of the "Pirs" airlock after the spacewalk,
- Retrieving three "Pille-MKS" radiation dosimeters, recording their dosages and equipping each Orlan (in pocket on left calf) with a sensor unit (A0309 & A0310) *[a third sensor (A0307) is worn by the FE-2 in his flight attire, and a fourth, A0308, remains on duty for SM background readings on the Pille Reader tray]*;
- Preparing & setting up a kit with test strips for the MO-9 "Biochemical Urinalysis" experiment in the SM's ASU facility for the usual pre-EVA session of the two spacewalkers tomorrow,
- Deactivating the Elektron oxygen (O_2) generator after purging its BZh Liquid Unit with nitrogen (N_2) at 0.65 kg/cm^2 via its KE3 & VN3 valves, and
- Turning off the AST Spectrometer of the Matryoshka-R (RBO-3-2) radiation payload plus checking the ALC-950 memory card for file quantity and space *[RBO-3-2 is using the ESA/RSC-Energia experiment ALTCRISS (Alteino*

Long Term monitoring of Cosmic Rays on the ISS/ALC) with its Spectrometer (AST) and ALC equipment, temporarily located in the FGB on panel 429 (normally in DC1)].

FE-2 Chamitoff prepared for the EVA-20A by setting up two SONY PD100 camcorders in the Lab and Node-1 to provide situational awareness during the uncrewed period tomorrow (viewing only, not recording). *[There's no tape in the camcorders, to prevent them from going into "Standby" mode. To get the longest view, the cameras are "zoomed out" with a Wide Conversion lens attached. The camcorders were positioned to provide most the encompassing view of the modules, each one using one of the module power outlets.]*

In addition, the USB cameras on the Lab SSC (Station Support Computer) A31p laptops were positioned by the FE-2 such that areas not covered by the Lab PD100 video cam can be viewed from the ground.

Also, to provide a laptop for his stay in the Soyuz, Gregory powered off the SSC-5 A31p and its "cobalt brick" power supply for temporary transfer to the Descent Module (SA) and collected freshly charged batteries from four Lab SSC Clients for use in the Soyuz during the Russian EVA, replacing them in the laptops temporarily with stowed batteries.

Other preparatory activities by Greg Chamitoff for EVA-20A, the decrewed period and a potential Soyuz relocation to the FGB nadir port (after Progress 29P undocking) today include –

- Readying the Kodak DCS760 EVA camera by initiating charging two batteries for it and later configuring the camera for operation,
- Closing the protective Lab science window shutter *[to be verified as Closed tomorrow prior to attitude control handover to RS (Russian Segment) thrusters at 11:50am],*
- Demating & taking down the ITCS LTL (Internal Thermal Control System/ Low Temperature Loop) jumper at the LAB1D6 rack after deactivation of the U.S. CDRA (Carbon Dioxide Removal Assembly) by the ground today (~12:20pm-5:20pm) and cooling no longer required,
- Transfer of US items, such as ODF (Operations Data Files) & CCPKs, to the RS,
- Deactivating PWS (Portable Workstation) laptops in the COL (Columbus Orbital Laboratory), and
- Closing USOS hatches at ~2:55pm *[for Kibo JPM (JEM Pressurized Module), Kibo JLP JEM Logistics Pressurized Segment), COL, Node-2, and US A/L (Airlock).]*

After CDR Volkov sets up the NOA/Nitric Oxide Analyzer (MBI-21) experiment later

today, he and Kononenko are to conduct another data take session (his third, Oleg's second), later filling in the electronic log book on the RSE1 laptop for downlink and restowing the hardware. Each subject takes two NO (Nitric Oxide) measurements in exhaled air. There will also be post-EVA data takes. *[Purpose of the ESA experiment ESANO1, consisting of the "Platon" analyzer and its power supply, is to monitor expired NO in the subject's exhaled air to detect signs of airway inflammation and indications of venous gas emboli (bubbles) that may be caused by inhalation of pollutants in the closed environment of the ISS cabin and increased risk of decompression sickness.]*

Oleg is also scheduled to perform routine IFM (Inflight Maintenance) on the Russian SRVK condensate water processor by removing & replacing its BRPK-1 (Condensate Separation & Pumping Unit) separator. *[The latter had been temporarily moved over on 5/30 from the line-2 BRPK to replace the earlier failed BRPK-1 separator.]*

The FE-2 spent a few minutes on the weekly inspection of the TVIS treadmill roller bearings, checking the treadmill's belt both left and right for any noticeable depressions due to seized or worn rollers. *[With the TVIS treadmill rollers approaching their end-of-life, the frequency of their inspection has recently been increased for safety.]*

The FE-1 will conduct the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1). Later tonight, Oleg will transfer the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Volkov & Kononenko are scheduled for their regular pre-EVA PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Sergey at ~2:15pm EDT, Oleg at ~2:30pm.

At ~11:05am EDT, Kononenko powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, and power supply) and at 11:10am conducted a ham radio exchange with students at the City

of Ottawa Central Experimental Farm, Ottawa/Ontario Canada. *[The Canada Agriculture Museum in Ottawa is a unique combination farm and museum. The Museum offers animated bilingual interpretation which shows the making and tasting of foods such as ice cream, bread and butter. Other demonstrations present farming activities, including year-round animal care and spring sheep shearing. Visitors to the animal barns will see a collection of common farm animals, as well as several rare breeds. The Museum's Tractors exhibition and the exhibition on rural electrification of one hundred years ago bring the science of the past to life. Questions to the crew were uplinked beforehand. "What kind of animals have been brought to space?"; "Is it possible to grow food in space?"; "What planet would be the best for farming?"; "What would be the easiest plant to grow in space?"; "What is the difference between growing plants on earth and in space?"; "What is GPS technology, and how does it affect agriculture?"; "What are the difficulties of agriculture in space?"; "What is your favorite farm animal and why?"]*

Uncrewed Station Ops Update: For the Orlan spacewalks on 7/10 & 7/15 Moscow has proposed not to configure RS hatches for station decrewing. This will keep hatches open between FGB & PMA-1, and SM & DC1, and hatch closed inside the SM between RO/Working Compartment & PkhO/Transfer Compartment). In case of a DC1 leak during airlock repress, the Soyuz TMA-12, with all three crewmembers, would relocate from the DC1 to the FGB nadir port, a brief 25-min trip. In this contingency, the Progress 29P, currently docked at the FGB port, would be separated on 7/11 at ~1:18pm EDT in sunlight. Soyuz 16S would undock from the DC1 on the same day at ~6:31pm, translate a few meters along the RS and redock at the FGB nadir dock at ~6:56pm. *[Note: A second docking attempt at the SM aft end, the current ATV location, is not considered due to insufficient Soyuz consumables.]*

CEO (Crew Earth Observations) photo targets uplinked for today were **S. Mozambique** *(the southern portion of this African nation is undergoing rapid land use change as mineral exploration is driving the construction of new infrastructure. This fair-weather pass in late morning offered the opportunity to acquire good baseline, contextual views of the southwestern part of the CEO target area. There are very few strong visual cues for this area, so as ISS approached the target area from the NW and left the mountain regions of South Africa, Greg was to try for near nadir views in the plains until the coast, then to map the coastal area),* **Hurricane Bertha** *(Bertha became a major hurricane yesterday with winds briefly approaching 115kts. The early morning pass of ISS found a somewhat weakened storm well to the right of track holding at just 95kts and moving northwestward. Trying for more detailed views today of the cloud structure and using the long lens settings only if the eye becomes visible during transit),* **Andrews Forest, Oregon** *(the Andrews Forest is a Long Term Ecological Research [LTER] site located in the Cascade Mountains of western Oregon. On this early morning pass, in fair weather,*

Chamitoff was to look left of track and try for contextual mapping views of the western flank of the Cascade Range), **Barringer Impact Crater** *(also known as "Meteor Crater," this site is a landmark feature in northern Arizona about 60 miles east of Flagstaff. After crossing the Grand Canyon, the FE-2 was to begin looking for the small crater just right of track. It will be midmorning and monsoon clouds will be closing in from the SE. It lies just south of Interstate Highway 20 in a barren plains area. Using the long lens settings for detail),* and **Lake Poopo, Bolivia** *(Lake Poopo is a small lake near the southern end of a long, elevated basin in the Bolivian Andes known as the Altiplano. The Altiplano extends from the relatively moist region of Lake Titicaca S-SEward to the large, bright playa of Salar de Uyuni. Poopo is subject to significant changes in size and color related to the El Niño-Southern Oscillation (ENSO) cycle. The station pass was in late morning and expected to be clear. Looking well right of track and trying for contextual views of the southern end of the Altiplano including Lake Poopo.)*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 53 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55204

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
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07/15/08 -- Russian EVA-20 (1:14pm)
07/18/08 -- ATV1 reboost
08/30/08 -- Progress M-64/29P undocking, from FGB nadir
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
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09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
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10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port)
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11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
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02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
03/25/09 -- Soyuz TMA-14/18S launch
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May '09)**
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/08/08
Date:	Tuesday, July 08, 2008 12:38:10 PM
Attachments:	

ISS On-Orbit Status 07/08/08

All ISS systems continue to function nominally, except those noted previously or below.

Crew Sleep Cycle: Wake/sleep cycle remains right-shifted by 3.5 hrs (5:30am - 9:00pm EDT).

Onboard activities today are mostly focused on the suited exercise/dry-run preparatory to Thursday's (7/10) Orlan spacewalk (EVA-20A).

FE-2 Chamitoff started his day with the week-long SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment, using the payload software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop. *[To monitor the crewmember's sleep/wake patterns and light exposure, Greg wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list. This is Week 1 of 3 for the FE-2.]*

After yesterday's completion of all Orlan-M suit preparations, dry-run activities began today at ~9:45am EDT with CDR Volkov tearing down and removing the air ducts between the Service Module Transfer Compartment (SM PkhO) and DC1 Docking Compartment/airlock (skipping ventilation fan V3) to make room for the subsequent suited exercise.

At the same time, FE-1 Kononenko worked on configuring the communications systems in the DC1 and Soyuz TMA-12 spacecraft for the exercise. *[The suited run requires wireless Tranzit-B suit radio telemetry on both semisets and temporary deactivation of the Russian VHF channel 1 (Very High Frequency, Russian: UKV1, for ultra-shortwave) to avoid interference from extraneous radio stations to the*

Orlans while over Russian ground stations (RGS). All EVA preps are monitored by the ground via audio. Tranzit-B TM is to be turned off later today at ~3:30pm EDT.]

After another functionality and leak checking of the Orlan-Ms, their equipment and their interface units (BSS) in the DC1 & PkhO, the crew began donning EVA gear at ~11:20am, including putting on personal gear bags, biomed harness, thermal underwear, LCG (liquid cooling garment), low-noise headset, gloves, etc.

After another checkout of comm hookups & biomedical parameter telemetry via the BSS Orlan interface system for vital signs and equipment monitoring, suiting up then culminated in ingress in the Orlans (~12:30pm) through their "backdoors" and sealing off of the backpacks.

Next in line are functionality checkouts of the suits and their BSS controls (e.g., temperature control handling, water cooling system ops, preliminary Orlan & BSS leak checks, preliminary dimensional suit fit checks at reduced suit pressure of 0.4at/5.9 psi, and about an hour of testing/training of suited mobility and translation inside the DC1, beginning at ~1:00pm. *[These exercises include translation to all DC1 work stations with mated fluid umbilical, verification of Orlan fit, checkout of onboard cooling system operation, assessment of how the interior DC1 config impacts operations with various gear and accessories such as the POV (EVA support panel) and BSS, moving the BRT (Body Restraint Tether) with a CLB (Crew Lock Bag) and securing the BRT on a handrail, retrieving the Kodak 760 camera from the KPU tool carrier and stowing it temporarily on the OTA swing arm, plus some typical EVA-20A tasks such as working with the Soyuz truss/node mockup to remove one of the two pyrobolts in the lock, etc.]*

FE-2 Chamitoff is to participate in part of the exercise by checking out his comm links.

Egress from the Orlans is timelined for around 2:00pm, to be followed by a one hour lunch break.

Afterwards, Volkov & Kononenko will restore communications settings in DC1 & Soyuz to nominal ops and perform post-training cleanup activities, including air duct assembly. Later tonight, after the Orlans are confirmed to be dry, they will be re-equipped with fresh consumables/replaceable elements for the spacewalk on Thursday.

During the suited exercise in the closed-off DC1, Gregory Chamitoff conducted the periodic inspection of all US segment (USOS), ESA & JAXA hatch seals (Node-1 Forward, Aft & Starboard, Airlock, Lab Aft & Forward, Node-2 Aft, Starboard & Port, Columbus, Kibo JPM Starboard & Zenith, Kibo JLP Nadir) in support of ACS

(Atmospheric Control System) maintenance, using a special vacuum cleaner and other tools (last time done: 4/16).

Making preparations for possible uncrewed operation, Chamitoff first worked in JAXA's Kibo modules JPM & JLP by checking out lighting fixtures and verifying that all GLA (General Luminaire Assembly) switches are set to ON/full bright and that the SRCA (System on/off Remote Control Assembly) is also turned on.

In the JPM, to support ground commanding from Japan's Tsukuba Flight Control Center, the FE-2 will also get science payloads ready for operation by connecting their video cables to the IPU (Image Processing Unit) and bus cables to the ISPR UIP (International Standard Payload Rack Utility Interface Panel).

Afterwards, Greg will connect the ISPR-3 (International Standard Payload Rack 3) RYUTAI via umbilical and verify that power is turned on for all active JEM racks (control switch JPM A2 on ISPR-A2, JPM1A6 on JEMRMS). *[RYUTAI ("fluid") is a Japanese multipurpose experiment/payload rack system to support the FPEF (Fluid Physics Experiment Facility), SCOF (Solution Crystallization Observation Facility), PCRF (Protein Crystallization Research Facility) and the IPU (Image Processing Unit) by providing structural interfaces, power, data, cooling, water and other items needed to operate science experiments in micro-G.]*

In preparation for possible remote-controlled operation, the FE-2 also deactivates the JPM SLT (System Laptop).

Moving over to ESA's Columbus module, Gregory will be checking out the vacuum part of the ECLSS (Environment Control & Life Support System), making sure that filter plugs are properly installed on the VAMRV (Vacuum Manual Repressurization Valve) on the forward side of the Columbus Starboard Deck Cone panel, and on the VEMRV (Venting Manual Repressurization Valve) on the aft side of the Starboard Deck Cone panel).

Chamitoff's work schedule also includes the periodic offloading of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1054) with the collected water slated for processing. No samples are required. *[Estimated offload time before reaching the tank's neutral point (leaving ~6 kg in the tank): ~30 min. Condensate collection continues to be performed by the CCAA while the Russian SKV-2 air conditioner is off, awaiting its overdue Khladon (Freon-218) refill. SKV-1 has been nonfunctional for a long time.]*

Oleg Kononenko is scheduled to handle the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage

locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The FE-2 is to perform the standard calibration on the new CSA-O_2 (Compound Specific Analyzer-Oxygen) units #1043 & #1059 delivered on 1J.

The routine maintenance of the SOZh system (ECLSS) in the SM, including ASU toilet facilities systems/replaceables, was added to Gregory's discretionary "job jar" task list for today.

A second discretionary item on his task list is to gather and temporarily stow US equipment that should be transferred tomorrow to the RS (Russian Segment) for the EVA-20A & EVA-20 spacewalks.

At ~2:05pm, Chamitoff is scheduled for another regular PMC (Private Medical Conference) via S- & Ku-band audio/video.

With Sergey & Oleg getting plenty of physical exercise today in form of the strenuous suited dry-run, the FE-2 worked out alone on the regular 2.5-hr. physical exercise protocol (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill and RED resistive exercise device. Afterwards, Greg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Uncrewed Station Ops Update: For the Orlan spacewalks on 7/10 & 7/15 Moscow has proposed not to configure RS hatches for station decrewing. This will keep hatches open between FGB & PMA-1, and SM & DC1, and hatch closed inside the SM between RO/Working Compartment & PkhO/Transfer Compartment). In case of a DC1 leak during airlock repress, the Soyuz TMA-12, with all three crewmembers, would relocate from the DC1 to the FGB nadir port, a brief 25-min trip (6:56pm-6:31pm EDT on 7/11). While ensuring crew safety and station integrity, this minimizes necessary crewtime which is already in severe shortage due to the EVA-20A date. The necessary waiver of the applicable Flight Rule (15-158) for the three hatches was discussed in detail on 7/7 by the IMMT (ISS Mission Management Team) and approved. There is no impact on status of KVD pressure equalization valves (PEV). *[Note: A second docking attempt at the SM aft end, the current ATV location, is not considered due to insufficient Soyuz consumables.]*

CEO (Crew Earth Observations) photo targets uplinked for today were **Hurricane Bertha** *(DYNAMIC EVENT: This tropical storm was just upgraded to the Atlantic*

season's first hurricane. It is tracking W-NWward through open waters and by the time of this ISS pass, at mid-morning, should be a strong Category 2 storm with 90kt winds. As the station approached from the NW, Chamitoff was to look left of track for a small, symmetric storm with a distinct eye and try for oblique views of the entire storm system showing its general cloud structure), **Red River Basin, TX** *(the Red River is a major tributary of the Mississippi River that also forms the border between the states of Texas and Oklahoma. The basin area north of the Dallas-Fort Worth area is primarily an agricultural region that is changing under increasing urban development. As ISS approached this area from the NW near mid-morning, Greg was to look for the W-to-E meandering flow of the river and map the area west of the man-made Lake Texoma),* and **Jarvis Island, Equatorial Pacific** *(this unusual, trapezoid-shaped island is located just south of the equator about halfway between Hawaii and the Cook Islands. It is low-lying, uninhabited, has very little vegetation and is just about 2 miles long and 1 mile wide. CEO is assisting international efforts to document and monitor the Earth's coral reef systems. On this late morning pass, looking just left of track for this target, then using the long lens settings for detailed views of the fringing coral reefs, especially those on the eastern side)*.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:51am EDT [= epoch]):*
Mean altitude -- 344.6 km
Apogee height -- 350.8 km
Perigee height -- 338.5 km
Period -- 91.43 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0009099
Solar Beta Angle -- 28.8 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 58 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55188

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/10/08 -- Russian EVA-20A (2:21pm)
07/15/08 -- Russian EVA-20 (1:14pm)
07/23/08 -- ATV1 reboost (tent.)
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
09/09/08 -- Progress M-64/29P undocking, from FGB nadir (may move to 8/30)
09/10/08 -- Progress M-65/30P launch

09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
03/25/09 -- Soyuz TMA-14/18S launch
05/15/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/30/09 -- STS-128/Atlantis/17A – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May '09)**
10/15/09 -- STS-129/Discovery/ULF3 - ELC1, ELC2
12/10/09 -- STS-130/Endeavour/20A – Node-3 + Cupola
02/11/10 -- STS-131/Atlantis/19A – MPLM(P)
04/08/10 -- STS-132/Discovery/ ULF4 – ICC-VLD, MRM1
05/31/10 -- STS-133/Endeavour/ULF5 – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/07/08
Date:	Monday, July 07, 2008 1:45:28 PM
Attachments:	

ISS On-Orbit Status 07/07/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 12 of Increment 17.*

Crew Sleep Cycle: Wake/sleep cycle remains right-shifted by 3.5 hrs (5:30am - 9:00pm EDT).

Gregory Chamitoff started his day with his first week-long session with the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment, using the payload software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop. *[To monitor the crewmember's sleep/wake patterns and light exposure, Greg wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list. This is Week 1 of 3 for the FE-2.]*

Gregory also ended his FD30 session with the NASA/JSC experiment NUTRITION w/Repository, his second, by collecting a final urine sample upon wakeup for storage in the MELFI (Minus-Eighty Laboratory Freezer for ISS). The sampling kit was then stowed away. Greg's next activity with this experiment will be the FD60 session. *[The current NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

Before breakfast, the CDR, FE-1 and FE-2 completed another periodic session of

the Russian biomedical routine assessment PZEh-MO-7/Calf Volume Measurement (fifth for CDR & FE-1, third for FE-2). *[Calf measurements (left leg only) are taken with the IZOG device, a custom-sewn fabric cuff that fits over the calf, using the knee and lower foot as fixed reference pints, to provide a rough index of deconditioning in zero-G and effectiveness of countermeasures.]*

After breakfast, Volkov & Kononenko had an hour reserved for reviewing specific procedures for EVA-20A, the first of two planned Orlan spacewalks, and tagged up with ground specialists via S-band. *[Among the procedures reviewed were timeline details, Strela crane operations (to maneuver EV2/Oleg to the Soyuz worksite), EV1/ Sergey joining him at the worksite, crew interactions during the EVA, placement of safety tethers, etc. Specialists are still assessing if there is a potential issue with the configuration in which Soyuz and the extended Strela could be left in case of an EVA termination due to a systems failure.]*

Later, with the STTS communication/telemetry links configured for working in the DC1 Docking Compartment, the two spacewalkers spent several more hours on -

- continuing Orlan preparations, e.g., gathering equipment & tools,
- taking documentary photography of the VSPLESK payload, to be installed outside during the second spacewalk (EVA-20),
- checking the installation of selected US add-on hardware on EV2's Orlan-M #26 (TV camera, power harness, etc.) for video coverage of the work at the Soyuz spacecraft,
- performing the gas/water separation in the Orlan & DC1 BSS interface unit cooling loops, and
- restoring STTS comm/TM links to nominal configuration.

Sergey also recharged the battery of the SONY HVR-Z1J digital high-definition camcorder (provided last year by VC12 Charles Simonyi) and configured the ZVK LIV Experimental Video Complex in the Service Module (SM) for covering EVA-20A. *[Volkov's setup involves the KL-211 MPEG-2 Encoder which uses the RSS1 A31p laptop (for monitoring the digital video) and a U.S. SSC (Station Support Computer) laptop (for converting analog TV from Russian PAL mode to U. S. NTSC) and making the video hardware connections, checked with a network ping test. Transmission tests with the ground followed (10:00am – 2:00pm EDT), including launching the NViewer (NASA Viewer) application on the Central Post SSC (Station Support Computer) laptop and the VLC Media Player on the RSS1 laptop, linking KL-211 to various video cameras onboard, and checking the digital video transmission over JSL/Ethernet plus OCA/Ku-Band to MCC-Houston and from there to Moscow via the ESA Gateway for COL-CC/Oberpfaffenhofen transmission to at TsUP-Moscow, plus transfer of the USOS analog video of the RS ISS video downlink via Streambox 2 to NISN (i.e., the Moscow Ostankino communication hub).]*

FE-2 Chamitoff worked several hours in the Kibo JPM (JEM Pressurized Module), first preparing the TCA LTL (Thermal Control Assembly/Low Temperature Loop) gas trap for the subsequent operations, by reconfiguring valves manually and activating the gas trap heater. After the operations, the heater will be deactivated and the valves reset to their nominal (bypassed) configuration.

As next steps, Gregory was to collect fluid samples in the JPM, specifically, to remove an LTL flexhose, install an ITCS (Internal Thermal Control System) fluid sampling adapter, connect umbilicals at the SAIBO and RYUTAI racks, and collect both ammonia and OPA (Ortho-Phthalaldehyde) fluid samples at the JPM1F2 sampling port. *[SAIBO ("living cell") is a Japanese multipurpose experiment/ payload rack system on the ISS that transports, stores and supports subrack facilities such as the CB (Clean Bench) and CBEF (Cell Biology Experiment Facility) equipment by providing structural interfaces, power, data, cooling, water and other items needed to operate science experiments in microgravity. RYUTAI ("fluid") is a Japanese multipurpose experiment/payload rack system to support the FPEF (Fluid Physics Experiment Facility), SCOF (Solution Crystallization Observation Facility), PCRF (Protein Crystallization Research Facility) and the IPU (Image Processing Unit) by providing structural interfaces, power, data, cooling, water and other items needed to operate science experiments in micro-G.]*

The FE-2 conducted the periodic (monthly) CSA-CP (Compound Specific Analyzer-Combustion Products) maintenance/checkout, today on all four units. *[The CSA-CP is a passive cabin atmosphere monitor that provides quick response capability during a combustion event (fire). Its collected data are stored on a logger. Garrett checked batteries, then zero-calibrated all instruments (to eliminate drift in the combustion sensors). Following zero calibration, the backup units were stowed in the Node, along with the sampling pump, while the prime unit was deployed at the SM Central Post.]*

Later tonight, Gregory is timelined for ~10 min. for the periodic inspection of the ELPS (Emergency Light Power Supply) in the Columbus module.

Sergey Volkov will conduct the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Oleg Kononenko is scheduled to handle the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew worked out in their regular 2.5-hr. physical exercise protocol (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1). Later tonight, Chamitoff transfers the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~9:15am, Sergey & Oleg downlinked a PAO TV message of greetings via S- & Ku-band to an International Youth Science School Conference on "Space Exploration: Theory and Practice", held currently (July 5-15) in Moscow at the Bauman MGTU (Moscow State Technological University). *[Today's crew downlink to TsUP Mission Control Center was viewed by International Youth Science School attendees including students from the Swiss Federal Institute of Technology, Lausanne (Switzerland), the Massachusetts Institute of Technology, the Northwestern University (Evanston, USA), the University of Sheffield (Sheffield, UK), Sardar Vallabhbhai National Institute of Technology (Gujarat, India), Aalborg University (Copenhagen, Denmark), and Russian students and professors.]*

At ~5:20pm, Volkov & Kononenko will be performing a video shoot in the ATV1 (Automated Transfer Vehicle 1) "Jules Verne" to be replayed on 7/17 in Paris at a festive event about ATV and ESA's ISS efforts during the top-level HOA (Heads of Space Agencies) meeting. An ISS downlink with a crew address will be scheduled during the event at ~8:00am EDT at ESA Headquarters. *[Shooting suggestions for today have one crewmember shown entering the ATV and conducting a "tour" of the large vehicle, then making presentations of four historic items, namely an original copy of the 19th century of Jules Verne's book "De la Terre à la Lune" (From the Earth to the Moon), a Jules Verne poster showing three small original manuscripts, and a set of two original manuscripts within their protective plastic covers.]*

CMG Testing: At 9:40am-12:40pm EDT today, a CMG steering test was performed by ground commanding. CMGs 1,2 and 3 were tested at five different speeds for each CMG to see if they stay in the steering law. This was an attempt to recreate a problem seen on the last CMG wheel speed test where CMG-3 toggled out of the steering law briefly.

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:46am EDT [= epoch]):*
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Perigee height -- 338.6 km
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Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.000909
Solar Beta Angle -- 24.1 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 49 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55172

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/10/08 -- Russian EVA-20A (2:21pm)
07/15/08 -- Russian EVA-20 (1:14pm)
07/23/08 -- ATV1 reboost (tent.)
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
09/09/08 -- Progress M-64/29P undocking, from FGB nadir (may move to 8/30)
09/10/08 -- Progress M-65/30P launch
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11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
1QTR CY09 -- STS-119/Discovery/15A launch – S6 truss segment
03/25/09 -- Soyuz TMA-14/18S launch
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May ’09)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)

1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/06/08
Date:	Sunday, July 06, 2008 10:57:38 AM
Attachments:	

ISS On-Orbit Status 07/06/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday -- off-duty for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff. Ahead: Week 12 of Increment 17.*

Crew Sleep Cycle: Wake/sleep cycle remains right-shifted by 3.5 hrs (5:30am - 9:00pm EDT).

Gregory Chamitoff started out on the second part of his Flight Day 30 session with the NASA/JSC experiment NUTRITION w/Repository. This is an all-day session, the second for Greg, of collecting urine samples several times for 24 hrs through first void tomorrow morning. *[The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by supercold MELFI dewars), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

Oleg Kononenko completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The FE-1 also checked up on the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem, gathering weekly data on Total

Operating Time & “On” durations for reporting to TsUP-Moscow.

At ~8:35am EDT, the crewmembers conducted their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

At ~9:30am, Gregory had his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

The crew worked out in their regular 2.5-hr. physical exercise protocol (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this “Gateway” website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:38am EDT [= epoch]):*
Mean altitude -- 344.7 km
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Period -- 91.43 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0009029
Solar Beta Angle -- 19.4 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 16 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55157

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/10/08 -- Russian EVA-20A (2:18pm)
07/15/08 -- Russian EVA-20 (1:14pm)
07/23/08 -- ATV1 reboost (tent.)
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/observation)
09/09/08 -- Progress M-64/29P undocking, from FGB nadir (may move to 8/30)
09/10/08 -- Progress M-65/30P launch

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10/01/08 -- **NASA 50 Years**
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4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/05/08
Date:	Saturday, July 05, 2008 1:29:49 PM
Attachments:	

ISS On-Orbit Status 07/05/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – off duty for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff.*

Crew Sleep Cycle: Wake/sleep cycle remains right-shifted (5:30am - 9:00pm EDT).

Greg Chamitoff had his second session with the NASA/JSC experiment NUTRITION w/Repository, the FD30 session for blood collection only, for which he had to forego exercising and food intake for eight hours. Later today, the FE-2 will also set up the equipment for the 24-hour urine collections which start with the first void early tomorrow morning and continue through Monday morning. *[After performing self-phlebotomy, i.e., drawing blood samples (from an arm vein), the samples were first allowed to coagulate in the Repository for 20-30 minutes, then spun in the HRF RC (Human Research Facility/Refrigerated Centrifuge) and finally placed in MELFI (Minus-Eighty Laboratory Freezer for ISS). No thruster activity was allowed during the blood drawing. The RC was later powered off after a temperature reset to limit wear on the compressor, and cleaned.]*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the Service Module (SM) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

As part of the house cleaning, the crew also conducted regular maintenance inspection & cleaning on fan grilles in the FGB (TsV2), SM (VPkhO, VPrK, FS5, FS6 & FS9), DC1 (V3) screens and PF1/PF2 dust filters, as well as in the COL (Columbus Orbital Laboratory).

In addition, Volkov temporarily powered down the POTOK air filtration system for the periodic cleaning of its pre-filter, using the vacuum cleaner with narrow-slit nozzle attachment.

Earlier, Sergey serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out"-to-vacuum cycle on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~5:15pm EDT. Filter bed #1 regeneration was performed yesterday. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time done: 6/19&20).]*

Later today, FE-1 Kononenko is scheduled for regular maintenance work on the powered-down Russian SRVK-2M water condensate processor, first replacing its BKO multifiltration column unit with a new BKO spare, then also removing & replacing its life-expired FGS gas-liquid mixture filter with a new one. Both old units are to be discarded

Gregory completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

For the CDR, it was time again for the recharging of the Motorola Iridium-9505A satellite phone brought up on Soyuz 16S, a monthly routine job and his third time. *[After retrieving it from its location in the TMA-12/16S descent module (BO), Sergey was to initiate the recharging of its lithium-ion battery, monitoring the process every 10-15 minutes as it takes place. Upon completion at ~4:50pm, the phone will be returned inside its SSSP Iridium kit and stowed back in the BO's operational data files (ODF) container. The satphone accompanies returning ISS crews on Soyuz reentry & landing for contingency communications with SAR (Search-and-Rescue) personnel after touchdown (e.g., after an "undershoot" ballistic reentry, as happened during the recent 15S return). The Russian-developed procedure for the monthly recharging has been approved jointly by safety officials. During the procedure, the phone is left in its fire-protective fluoroplastic bag with open flap. The Iridium 9505A satphone uses the Iridium constellation of low-Earth orbit satellites to relay the landed Soyuz capsule's GPS (Global Positioning System) coordinates to helicopter-borne recovery crews. The older Iridium-9505 phones were first put onboard Soyuz in August 2003. The newer 9505A phone, currently in use, delivers 30 hours of standby time and three hours of talk, up from 20 and two hours, respectively, on the older units.]*

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1). Later tonight, Gregory will transfer the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

The Russian crewmembers had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Sergey at ~9:45am EDT, Oleg at ~11:30am.

At ~7:50am, as part of his FD30 NUTRITION w/Repository session today, Gregory held a teleconference with ground specialists at JSC, including the Principal Investigator, Dr. Scott Smith.

At ~8:05am, the three crewmembers tagged up for 90 min with EVA representatives of star City's Cosmonaut Corps to go over the two upcoming Russian spacewalks in careful detail, via S-band during several comm windows.

Weekly Science Update *(Expedition Seventeen -- Week 11)*

3-D SPACE : Second session has been successfully performed by Greg Chamitoff on 6/30, "much faster than the first session".

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Measurements continue in FGB module. Last memory card exchange was performed on 7/1.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): The experiment platform continues to operate nominally. A DHPU (Data Handling Processing Unit) software patch is currently being developed to fix the link error issues encountered with DEBIE-2 and FIPEX instruments. - DEBIE-2: Link error still in work. However a work-around allows for regular science data acquisition using an on-board IOP (Instrument Operations Procedure), but not yet in conjunction with any FIPEX IOP – a final software patch, which will enhance the present instrument capabilities, is under finalization on ground; - DOSTEL**:** On-going science acquisition; - EuTEMP**:** Currently inactive as planned; - EVC: Several successful ground commanded runs. Some nice pictures of Earth at sunset and sunset could be obtained. In full Sun illumination, the EVC sensor seems to saturate and consequently the picture quality is not optimum; - EXPOSE: On-going science acquisition; - FIPEX: Science script was running nominally until 6/28, when a sudden sensor switch off was encountered. It is a known problem, under assessment. Currently up and running; - MEDET: Some commandings were performed to adjust the frequency of acquisition of the microcalorimeter. Continuously acquiring science data; - PLEGPAY**:** currently in READY mode, no science data acquisition on-going; - TRIBOLAB: The Ball-Bearing experiment 1/2/3 which is running since 6/16 has been paused during the EUTEF power-down on 6/21 and has been resumed since. On 6/25, the experiment went suddenly to Non-Nominal Mode, after some higher than expected currents have been measured with the motor. On 6/30, the instrument was put in Thermal Stabilization Mode, and the Ball-Bearing experiment 1/2/3 was restarted on 7/1. This experiment run is expected to last until Week #14.

FSL (Fluid Science Laboratory): FSL is back and running. Further FSL commissioning activities remain to be done.

GEOFLOW: A long and complex mechanical procedure which aimed at replacing the lamp of the CEM (Central Experiment Module)-Upper Drawer has been successfully completed by Greg on 7/1. The next day, ground teams in Europe activated the FSL Rack and successfully completed a significant number of the check-out steps. That means that FSL is back and running. The start of GEOFLOW is pending further FSL remaining commissioning activities (FSL RIC and FSL VMU software upgrades, check of FSL optical modes). In the near future, the crew will swap the optical target, stand-by until further optical modes checks, and then will be able to insert the GEOFLOW Experiment Container. "…we are a significant step closer to GEOFLOW start. Thanks a lot for the great job on-orbit!"

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Planned.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 "Pirs".

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer, ESA): Measurements are currently planned before and after the Russian EVA-20 on 7/10 for the two Russian cosmonauts.

NUTRITION w/REPOSITORY: In progress.

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems):

Ongoing.

SAMPLE: Complete.

SHERE (Shear History Extensional Rheology Experiment): SHERE was successfully installed into the MSG (Microgravity Science Glovebox) on 6/29.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): In progress.

SOLAR (Solar Monitoring Observatory): LAN (Local Areas Network) connectivity with SOLAR has been lost since 6/25. SOLAR is currently powered via the feeder #2 (survival) only and all instruments are off. Troubleshooting plan has been worked out this week and the next steps would require crew support to diagnose the connectivity between Columbus and SOLAR, making use of the ESA Multi-Purpose Laptop. Unfortunately most of the on-going Sun observation period data acquisition has been lost, which ends on 7/7. - SOVIM**:** Instrument switched off pending above issue; - SOLSPEC: Instrument switched off pending above issue; - SOLACES: Instrument switched off pending above issue.

SOLO: Planned.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): The four ECs (Experiment Containers) of Rotor B are yet to be retrieved by the crew from the blocked Rotor B. BIOLAB could not be activated from ground yet, pending resolution of the Smoke Detector issue. A troubleshooting plan has been developed to recover all the BIOLAB functionalities. The remaining WAICO-#1 ECs will be disposed and replaced by six Reference ECs on Rotor B.

CEO (Crew Earth Observations): Continuing.

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this “Gateway” website:

http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/10/08 -- Russian EVA-20A (2:18pm)
07/15/08 -- Russian EVA-20 (1:14pm)
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09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
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10/12/08 -- Soyuz TMA-13/17S launch
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2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May '09)**
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4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/04/08
Date:	Friday, July 04, 2008 2:51:39 PM
Attachments:	

ISS On-Orbit Status 07/04/08

All ISS systems continue to function nominally, except those noted previously or below. *Independence Day holiday for the US of A, but a full workday for the crew.*

Crew Sleep Cycle: Wake/sleep cycle remains right-shifted (5:30am - 9:00pm EDT).

Continuing preparations for the two upcoming Orlan EVAs, CDR Volkov & FE-2 Chamitoff held another 3-hr. training session in Soyuz TMA-12 to familiarize the American FE-2 with spacecraft ops during his isolation in the Descent Module (SA) during the EVAs. FE-1 Kononenko joined in the drill for some time. *[With Sergey supervising, Gregory's hands-on training focused on equipment familiarization, working with Soyuz communications facilities, monitoring & interfacing with the Soyuz Neptun-ME console displays & controls, reviewing his tasks during his stay in the SA, assisting the CDR & FE-1 with leak checking, pressure equalization between Orbital Module (BO) and SA, BO/SA hatch opening, Orlan suit doffing if required, etc.]*

After deferral of yesterday's MELFI (Minus Eighty Degree Laboratory Freezer for the ISS) activity, Chamitoff today worked on the sample rearrangements in the Brayton-cycle freezer, swapping the latest blood and urine samples in their box modules between two dewars of different temperature, started on 7/2. *[Sample vials, separated in bags, were swapped between Dewars 2 & 3 and Dewars 1 & 2. Rationale: The uncrewed station configuration during the upcoming Russian spacewalks will require MELFI being powered off for an extended period. Gregory's current configuration changes between dewars are intended to provide best possible protection of the science samples contained in them. Toward this aim, Greg is packing as much thermal mass ("coldness") into Dewar 2 to maximize the cold volume hold time.]*

The CDR performed the periodic service of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on

absorbent bed #1 of the regenerable dual-channel filtration system. The process will be terminated around sleeptime, at ~8:45pm EDT. Bed #2 regeneration follows tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time: 6/23&24).]*

With the ATV WDS (Automated Transfer Vehicle/Water Delivery System) tanks emptied of their water contents, Oleg Kononenko set up the hose & electric pump assembly and initiated (later closed out) transfer of urine from four EDV-U containers in the Service Module (SM) to ATV WDS tank #2. *[The setup was then torn down and the hose capped and stowed in its KBO-M bag for future ATV urine transfers, with the IMS (Inventory Management System) updated accordingly.]*

After the recent upload by the Tsukuba JFCT (Japanese Flight Control Team) of a new database file to the Kibo JEMRMS (Japanese Experiment Module/Robotic Maneuvering System) console, Gregory Chamitoff today briefly activated, then deactivated the RTL (RMS Laptop) to enable/initialize the database.

The FE-2 also completed the T+2 in-flight microbiology analysis of "Week 11" potable water samples collected by him in MCDs (Microbial Capture Devices) and set up for incubation on 7/2. *[The water samples were taken from the SM SRV-K (Service Module/Condensate Water Processor) Hot and Warm water taps. Two 750 mL samples from the three ports (SRV-K Hot + Warm, plus SVO-ZV) will return on Flight STS-126/ULF2 for postflight chemical analysis.]*

Chamitoff then took measurements for the regular atmospheric status check for $ppCO_2$ (Carbon Dioxide partial pressure) in the Lab, SM (at panel 449) and COL (Columbus Orbital Laboratory), using the hand-held CDMK (CO_2 Monitoring Kit, #1002). *[The battery pack is to be replaced with the one from unit #1009 if necessary.]*

Greg also conducted the periodic offloading of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1054) with the collected water slated for processing. No samples were required. *[Estimated offload time before reaching the tank's neutral point (leaving ~6 kg in the tank): ~30 min. Condensate collection continues to be performed by the CCAA while the Russian SKV-2 air conditioner is off, awaiting its overdue Khladon (Freon-218) refill. SKV-1 has been nonfunctional for a long time.]*

Sergey Volkov performed the regular bi-monthly reboot of the OCA Router and File Server SSC (Station Support Computer) laptops.

Later, Greg will do the periodic battery check and reboot of the COL PWS (Columbus Orbital Laboratory/Portable Workstation) laptop, a monthly activity.

Today's mated Soyuz 16S thruster firing test was scheduled at 1:38pm-1:55pm EDT. After attitude handover to the Russian MCS (motion control system) at 1:30pm, the ISS goes briefly into free drift for the standard pre-undock hot fire test of the Soyuz KDU Combined Propulsion System. Attitude authority was to return to USOS momentum management at 3:14pm. *[For the test, the Lab window shutters were closed for protection by Greg at 8:40am, the ISS audio remained configured for the crew's entry into the Soyuz, the solar arrays were feathered to mitigate structural loads and contamination issues, and certain electrical loads were powered down due to the decreased power availability. All systems were to be returned to nominal configurations after the test.]*

To prepare for the eventuality that the Progress TM-64/29P cargo ship needs to be undocked from the FGB nadir port to allow repositioning the Soyuz 16S spacecraft in case of a contingency after the upcoming Orlan EVAs, FE-1 Kononenko dismantled and removed electronic equipment from the ship, to be recycled, specifically the US-21 matching unit, the cargo ship's LKT local temperature sensor commutator (TA251MB) of the BITS2-12 and its PZU-1M ROM (read-only memory) unit. These devices will be re-installed if the crew ingress after EVA-20A & EVA-20 is nominal. *[When a Progress is undocked and jettisoned, the valuable electronics are retained, to be recycled on a future vehicle.]*

Continuing preparations for Progress 29P undocking, Kononenko & Volkov then installed the StM Docking Mechanism between Progress and the FGB. *[StM is the "classic" probe-and-cone type, consisting of an active docking assembly (ASA) with a probe (SSh), which fits into the cone (SK) on the passive docking assembly (PSA) for initial soft dock and subsequent retraction to hard dock. The ASA is mounted on the Progress' cargo module (GrO), while the PSA sits on the docking ports of the SM, FGB and DC1.]*

Later in the day, after activating the 29P, Oleg will disassemble the air duct in the hatchway to the FGB, remove the threaded quick-disconnect (QD) screw clamps of the FGB docking & internal transfer system (SSVP), which has rigidized the mating surfaces, closes hatches between 29P & the FGB and performs the standard one-hour leak check of the vestibule to verify hermeticity.

Before sleeptime tonight, Chamitoff is to set up NASA's NUTRITION/Repository experiment hardware for his second session scheduled tomorrow. For the phlebotomy (blood sample draw), Greg has to start fasting 8 hrs before, i.e., tonight, with only water consumption allowed. *[The NUTRITION project is the most*

comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by supercold MELFI dewars), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]

Sergey Volkov completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1. Later, Gregory was to transfer the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~7:55am EDT, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU/*Glavnaya operativnaya gruppa upravleniya* = *"Main Operative Control Group"*), including Shift Flight Director (SRP), at TsUP-Moscow via S-band/audio, phone-patched from Houston and Moscow.

At ~12:23pm, Chamitoff powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, and power supply) and at 12:28pm conducted a ham radio exchange with the Round Rock Scout Pack #304 and Blackland Prairie Elementary School, Round Rock, TX. *[Cub Scout Pack 304 consists of about 50 boys, most of whom are students at Blackland Prairie Elementary School in Round Rock, Texas. The pack and the school are participating in this contact as a joint educational project. The project reinforces what the Cubs have been learning in their Science class, and enables them to earn some of the requirements for their "Scientist" activity badge in Scouting. The Cub's radio station has been set up at the school. Questions to Greg were uplinked beforehand. "Were you afraid to travel into space?"; "How do you sleep onboard the Space Station with no gravity?"; "Would you go to the moon if you had the opportunity?"; "Are you weightless all the time in the Space Station?"; "How much training is required to be an astronaut?"; "How does it feel to be so far away from Earth?"; "Do you think there is intelligent alien life, and if so, why?"; "What school subjects helped you most in becoming an astronaut?"; "What do you do in your*

spare time in space?"; "What suggestions do you have for kids as they prepare for the future?"; "What impact will the shuttle missions have on future space missions?"; "How do you get privacy on the Space Station?"]

WRM Update: A corrected Water Recovery Management "cue card" was uplinked overnight for the crew's reference in lieu of yesterday's uplink. *[The new card (17-0002Q) lists 35 CWCs (Contingency Water Containers,~1365.2 L total) for the four types of water identified on board: technical water (650.6 L, for Elektron, flushing, hygiene, incl. 509.4 L non-usable water because of Wautersia bacteria), potable water (706.7 L, incl. 260.6 L currently on hold), condensate water (4.9 L), waste/ EMU dump and other (7.9 L). Wautersia bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

CEO (Crew Earth Observations) photo targets uplinked for today were **Congo River headwaters** *(Dynamic event. Cloudiness over equatorial Africa is so pervasive that the Congo basin is seldom photographed. Clearer skies are forecast: Greg was to look right for oblique views of the southern basin and its major rivers. Lake Tanganyika at nadir),* and **Big Sur fires**, California *(Dynamic event. Overnight on Tuesday July 1, fires near Big Sur unexpectedly strengthened, and residents are now evacuating. Extensive yellow-brown smoke plumes should be visible left of track. Forecast is for partly cloudy weather. "Statewide, more than 19,000 firefighters and other workers have been fighting fires since June 20, when a line of storms and lightning sparked hundreds of blazes across the northern and central parts of the state.")*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 9:14am EDT [= epoch]):*
Mean altitude -- 344.8 km
Apogee height -- 350.6 km
Perigee height -- 339.0 km
Period -- 91.43 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0008601
Solar Beta Angle -- 10.3 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 22 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55126

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

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07/15/08 -- Russian EVA-20 (1:14pm)
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05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May ’09)**
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4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
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1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

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http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/03/08
Date:	Thursday, July 03, 2008 3:14:33 PM
Attachments:	

ISS On-Orbit Status 07/03/08

All ISS systems continue to function nominally, except those noted previously or below.

Crew Sleep Cycle: Wake/sleep cycle remains right-shifted (5:30am - 9:00pm EDT).

Continuing preparations for the two upcoming Orlan EVAs, CDR Volkov & FE-2 Chamitoff began their day with a 3-hr. training session in Soyuz TMA-12 to familiarize Gregory with spacecraft ops during his isolation in the Descent Module (SA) during the EVAs. *[With Sergey supervising, Gregory's hands-on training focused on equipment familiarization, working with Soyuz communications facilities, monitoring & interfacing with the Soyuz Neptun-ME console displays & controls, reviewing his tasks during his stay in the SA, assisting the CDR & FE-1 with leak checking, pressure equalization between Orbital Module (BO) and SA, BO/SA hatch opening, Orlan suit doffing if required, etc.]*

Afterwards, Chamitoff & FE-1 Kononenko worked in the US Airlock (A/L) on EMU (Extravehicular Mobility Unit) #3004 to disconnect and remove its power harness for its subsequent use on an Orlan-M suit for EVA-20A. *[The electrical harness, which normally powers the glove heaters and the EMU TV, is going to be used, along with a US REBA (Rechargeable EVA Battery Assembly), on Orlan #26 to provide real-time EVA video coverage via the US EMU TV and helmet lights. The harness will be installed on Orlan #26 next week during the EVA Dry-Run. EMU #3004 is not planned for use during Increment 17, 18, or ULF2 and will be brought home on 15A.]*

Afterwards, Kononenko continued previously started work on Orlan #26, equipping it up with the electrical cable to provide power from the REBA to the US wireless TV ERCA (EMU RF Camera Assembly) in the BRTA-1M telemetry systems unit installed earlier (6/27).

Later, the crew conducted a 1.5-hr review of the airlock procedures for DC1 Docking Compartment egress/ingress, supported with ground specialist tagup via S-band. FE-2 Chamitoff also tagged up with EVA specialists at MCC-H to discuss his support activities.

As part of their standard fitness evaluation, Kononenko & Volkov undertook another session with the Russian MO-5 MedOps protocol of Cardiovascular Evaluation during Graded Exercises on the VELO cycle ergometer, assisting each other as CMO (Crew Medical Officer). (Last time done: 5/21). *[The 50-min assessment, supported by ground specialist tagup via VHF and telemetry monitoring, uses the Gamma-1 ECG equipment with biomed harness, skin electrodes and a blood pressure and rheoplethysmograph cuff wired to the cycle ergometer's instrumentation panels. For the graded exercise, the subject works the pedals after a prescribed program at load settings of 125, 150, and 175 watts for three minutes each. Data output involves a kinetocardiogram, rheoplethysmogram, rheoencephalogram and a temporal pulsogram.]*

Chamitoff did another sample rearrangement in the MELFI (Minus Eighty Degree Laboratory Freezer for the ISS), swapping the latest blood and urine samples in their box modules between two dewars of different temperature, started yesterday. *[Today, sample vials (separated in 6 bags) were swapped between Dewar 2 and Dewar 3. Rationale: The uncrewed station configuration during the upcoming Russian spacewalks will require MELFI being powered off for an extended period. Gregory's current configuration changes between dewars are intended to provide best possible protection of the science samples contained in them. Toward this aim, Greg is packing as much thermal mass ("coldness") into Dewar 2 to maximize the cold volume hold time.]*

In the FGB, after having set up the Matryoshka-R (RBO-3-2) radiation payload on 7/1 with a new memory card (#950), the FE-1 today checked the contents of the new card for temperature, quantity and total file size, prepared all data for downlink and reinstalled the ALC-950 PCMCIA (Portable Computer Memory Card International Adapter) card in the Spectrometer. *[RBO-3-2 is using the ESA/RSC-Energia experiment ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS/ALC) with its Spectrometer (AST) and ALC equipment, temporarily located in the FGB on panel 429 (normally in DC1).]*

With the TVIS treadmill roller bearings approaching their end-of-life, the FE-2 spent a few minutes on the weekly inspection of the rollers, checking the treadmill's belt both left and right for any noticeable depressions due to seized or worn rollers.

The FE-1 completed the periodic (about twice a month) replenishing of the Elektron oxygen generator's water supply for electrolysis, filling the KOV EDV container with

water transferred on 6/30 from the ATV WDS (Water Delivery System) tank 1 to an empty EDV. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron shutdown.]*

Oleg also conducted today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Later, working from the Russian discretionary "time permitting" task list, Kononenko completed the daily IMS (Inventory Management System) maintenance, updating/ editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (FE-2), and VELO bike with bungee cord load trainer (CDR/MO-5, FE-1/MO-5). Before sleeptime tonight, Oleg is to transfer the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~1:35pm EDT, the CDR and both FEs participated in a seven-minute live televised PAO interview event with KGPE-TV (Mike Scott) in Fresno, CA.

At ~3:25pm, the ISS crew is scheduled for their regular weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[Private S/G-2 (Space-to-Ground 2) phone patch via SSC (Station Support Computer)]*.

A new task added to Gregory Chamitoff's voluntary "job jar" is the transfer of hardware (ESA payload spares) from ATV to COL (Columbus Orbital Laboratory) and to unpack/rearrange/stow the CTBs (Cargo Transfer Bags) in the Columbus MSSP (Mobile System Stowage) & FSSP (Fixed System Stowage) Provisions or in other CTBs.

WRM Update: An updated Water Recovery Management "cue card" was uplinked overnight for the crew's reference. *[The new card (17-0002P) lists 35 CWCs (Contingency Water Containers,~1365.2 L total) for the four types of water identified on board: technical water (650.6 L, for Elektron, flushing, hygiene, incl. 509.4 L non-usable water because of Wautersia bacteria), potable water (706.7 L, incl. 260.6 L currently on hold), condensate water (4.9 L), waste/EMU dump and other (7.9 L).*

Wautersia bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]

FSL Troubleshooting Update: On 7/1, during his troubleshooting of the Fluid Science Laboratory in ESA's Columbus module, Chamitoff replaced the halogen lamp that appeared to be malfunctioning in the FSL CEM (Central Experiment Module). Yesterday, FSL rack checkouts by ground teams at COL-CC/ Oberpfaffenhofen showed that Greg's work was successful and the FSL is fully functional. Further FSL commissioning is required prior to starting Geoflow payload operation, but Geoflow can be installed.

Russian TVM Issue: As reported by Moscow, Lane 3 of the Russian Terminal Computer (TVM) system is showing off-nominal performance. Under investigation.

EVA-20A Timeline Preview: Orlan EVA-20a by Volkov/EV1 & Kononenko/EV2 is scheduled to begin at on 7/10 ~2:18pm EDT (DC1 EV hatch open), to last an estimated 6 hrs. During the spacewalk, EV2 will be riding on the DC1-based Strela 1 crane, operated via hand crank by EV1, who will then join EV2. Main objective is the inspection of the Soyuz TMA-12 spacecraft at its first separation plane (Plane I) followed by removal of one pyrobolt for return to Earth. Before removing the separation bolt, EV2 will install temporary protective covers on the spacecraft's DPO attitude control thrusters, open up the MLI (Multi-Layer Insulation), demate the pyrobolt's electrical connector and cut the wiretie between the pyrobolts. MLI will then be reattached and the covers removed again. If enough time remains after the Soyuz activity, the spacewalkers will also install a docking target (for the new MLM/ Multipurpose Laboratory Module) in the SM PkhO (Transfer Compartment) area for zenith port docking. *[Background: Before their separation, Descent Module (SA) & Instrumentation Compartment (AO) are connected by five locks, each "zamok" containing two pyrobolts with individual electrical connection, of which only one needs to fire to release the lock. The locks are equally spaced around the 360-degree circumference of the separation plane, i.e., 72 deg apart. After the five locks have released, five pushers, also equally spaced, separate the two modules by pre-loaded spring force. Each lock and pusher is located at the apex (node) of two triangularly arranged aluminum pipes, i.e., altogether 20 inclined pipes, which make up the open truss structure between the modules.]*

EVA-20 Timeline Preview (preliminary): Orlan EVA-20 by Volkov & Kononenko is scheduled to begin on 7/15 at ~1:14m EDT (DC1 EV hatch open), to last an estimated 5 hrs 30 min. Part of the EVA will be supported by the DC1-based Strela 1 crane, operated via hand crank. Main objectives of EVA-20 are –

- Closeout ops on Soyuz TMA-12 Plane I inspection/pyrobolt removal (if not completed during EVA-20A);
- Installation of a new docking target on SM PkhO (Transfer Compartment)

for zenith port docking of the MLM (if not completed during EVA-20A);

- Post-installation photography of the new docking target;
- Inspection of mounting holes for an adapter of a Kurs antenna (4AO-VKA) on PkhO-RO (SM Working Compartment, small diameter section) for MLM;
- Transferring one "Yakor" foot restraint (of two) from the DC1 EVA ladder to the SM and installing it in an attachment socket at a PkhO handrail (two Yakors were installed on DC1 ladder during EVA-17A on 2/22/07);
- Installing the VSPLESK ("Burst") science payload on a handrail at SM RO (large diameter section); and
- Removing the BIORISK-MSN (BIO-2) experiment container 1 (of three) from the DC1 for return to the station (BIORISK-MSN, with three containers, was installed during EVA-19 on 6/6/07).

Uncrewed Station Ops Planning: One of the contingencies associated with the Orlan EVA-20A next week (and EVA-20 on 7/15) could require uncrewed station operation for some time. As per IMMT (ISS Mission Management Team) decision this morning, SM-to-ATV hatches are to remain open during this period (to be reassessed for EVA-20). ATV batteries are non-rechargeable, thus, time for ATV to be on independent power is very limited. Most of the USOS preparations for the uncrewed period will be done by Gregory Chamitoff next Wednesday (7/9), such as transferring selected hardware to the RS (Russian Segment), setting up a PCS (Portable Computer System) laptop in the FGB as backup to the PCS in the RS, powering down ham/amateur radio equipment, reconfiguring some LAN software (NetMeeting, KFX), powering down the COL PWS (Columbus Orbital Laboratory Portable Workstation) laptop, and closing selected hatches. On 7/10, the IATCS (Internal Thermal Control System) will be configured as usual for uncrewed ops, some racks will be jumpered to the LTL (Low Temperature Loop) in case they need cooling, and some remaining hatches will be closed, before Gregory moves to the Soyuz Descent Module (SA) and closes the hatch between it and the Orbital Module (BO).

CEO (Crew Earth Observations) photo targets uplinked for today were **Mt. Kilimanjaro, Kenya** *(this famous peak, at 19,340 feet, is Africa's highest mountain and is located in northeastern Tanzania near the border with Kenya. CEO specialists are monitoring the tiny ice fields near the summit that have noticeably diminished during the twentieth century. On this pass, just after midday local time, there may have been low clouds in the surrounding plains as ISS approached the area from the NW. Looking well right of track for the high volcanic crater with patches of ice and snow and using the long lens settings for detail),* **S. Mozambique** *(the southern portion of this African nation is undergoing rapid land use change as mineral exploration is driving the construction of new infrastructure. This ISS fair-weather pass in mid-afternoon offered the opportunity to acquire good*

baseline, contextual views of the southwestern part the target area. There are very few strong visual cues for this area, so as ISS approached the target area from the NW and left the mountain regions of South Africa, Greg was to try for near nadir views in the plains until reaching the coast, then map the coastal area), and **Georgia Coastal Ecosystems** *(the coastal wetlands and barrier islands of Georgia are designated a Long Term Ecological Research [LTER] site. ISS had a fine nadir pass over this target in fair weather conditions, just before noon local time. As the station approached from the NW, the FE-2 was to use the long lens setting to map, in detail, the coastal features northward from the urban areas of Jacksonville, Florida)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 9:01am EDT [= epoch]):*
Mean altitude -- 344.8 km
Apogee height -- 350.5 km
Perigee height -- 339.1 km
Period -- 91.43 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0008498
Solar Beta Angle -- 5.9 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 48 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55110

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/10/08 -- Russian EVA-20A (2:18pm)
07/15/08 -- Russian EVA-20 (1:14pm)
07/23/08 -- ATV1 reboost (tent.)
09/05/08 -- ATV1 undocking, from SM aft port (loiter until ~9/25 for nighttime reentry/ observation)
09/09/08 -- Progress M-64/29P undocking, from FGB nadir (may move to 8/30)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (SM aft port)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (FGB nadir port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC

11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
1QTR CY09 -- STS-119/Discovery/15A launch – S6 truss segment
03/25/09 -- Soyuz TMA-14/18S launch
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May '09)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/02/08
Date:	Wednesday, July 02, 2008 2:49:47 PM
Attachments:	

ISS On-Orbit Status 07/02/08

All ISS systems continue to function nominally, except those noted previously or below.

Crew Sleep Cycle: Wake/sleep cycle remains right-shifted (5:30am - 9:00pm EDT).

Continuing preparations for the two upcoming Russian Orlan EVAs, CDR Volkov & FE-1 Kononenko today focused on the second spacewalk, EVA-20, starting out with a three-hour review of familiarization material, watching a training video, and studying the preliminary EVA timeline (details, see below).

Later, Volkov gathered equipment and tools for EVA-20, going by an uplinked search list and supported by ground specialist tagup. *[Besides two well-stocked tool kits, EVA-20 equipment includes the new VSPLESK ("Burst) science payload, a container for the BIORISK-MSN payload and a mounting platform.]*

After configuring STTS communication/telemetry links for their stay in the DC1 Docking Compartment, Volkov & Kononenko then –

- Readied hardware and tools for the first spacewalk, EVA-20A,
- Reviewed staging procedures & photography requirements for the docking target installation, "Yakor" foot restraint transfer, and inspection of mounting holes for the Kurs antenna,
- Performed a pressure check on the supplementary BNP portable air repress bottle in the SM PkhO (Service Module Transfer Compartment),
- Updated the airlock depress/repress cue cards in the DC1 "Pirs", and
- Restored nominal STTS comm settings in the DC1.

FE-2 Chamitoff continued checking out JEM (Japanese Experiment Module) "Kibo" payload systems, today working on the JCGSE (JEM Common Gas Support Equipment), with the Ar (Argon) gas supply from the Ar GBUs (Gas Bottle Units)

opened to take pressure readings for leak checking. *[Checkout activities included accessing and setting the JEM HRMS (High Rate Data Multiplexer & Switcher), after configuring cable connections to the HRMS patch panel. After the checkout, the Ar gas supply was stopped and the HRMS access door closed again.]*

Chamitoff also conducted "Week 11" sampling of potable water for chemical and microbial analysis from the SVO-ZV tap and two SRV-K taps, the latter after preliminary heating of the water (three heating cycles) and flushing. *[Gregory collected three 225 mL samples (for inflight microbial analysis) and two 750 mL samples (for postflight chemical analysis) from each of three ports (SRV-K hot, SRV-K warm, SVO-ZV) for return on STS-126/ULF2.]*

Later, the FE-2 performed the in-flight microbial analysis using the WMK (Water Microbiology Kit) and its MCDs (Microbial Capture Devices) with Coliform Detection Bags. The small amounts of flush and leftover water in the 50 mL waste water & micro sample in-flight analysis bags were reclaimed for use. *[Coliform bacteria are the commonly-used bacterial indicator of sanitary quality of foods and water. They are defined as rod-shaped "gram-negative" non-spore forming organisms that ferment lactose with the production of acid and gas when incubated at 35-37 degC.]*

Gregory also conducted the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WRM (Water Recovery & Management) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week. The current card (17-0002O) lists 36 CWCs (~1365.2 L total) for the four types of water identified on board: technical water (650.6 L, for Elektron, flushing, hygiene, incl. 509.4 L non-usable water because of Wautersia bacteria), potable water (706.7 L, incl. 260.6 L currently on hold), condensate water (0 L), waste/EMU dump and other (7.9 L). Wautersia bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

Oleg Kononenko took the periodic readings of potentially harmful atmospheric contaminants in the SM, using the CMS (Countermeasure System), a component of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, which uses preprogrammed microchips to measure H_2CO (Formaldehyde, methanal), CO (Carbon Monoxide) and NH_3 (Ammonia), taking one measurement per microchip. Today's measurements also looked for O_3 (Ozone), C_6H_6 (Benzene) and NO_2 (Nitrogen Dioxide), using special chips. *[CMS is a subsystem of the Russian SKDS Pressure Control & Atmosphere Monitoring System.]*

Later tonight, Sergey Volkov is scheduled to perform monthly maintenance on the

deactivated Russian IK0501 GA (Gas Analyzer) of the SOGS Pressure Control & Atmospheric Monitoring System by replacing its CO_2 filter assembly (BF) with a new unit from FGB stowage (done last: 5/22), then reactivating the unit.

Kononenko has another 30 min. set aside to continue relocating and loading common trash into the ATV1 (Automated Transfer Vehicle) “Jules Verne”, based on an uplinked checklist for discarded cargo.

The FE-1 conducted today’s routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

The CDR completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Greg rearranged samples in the MELFI (Minus Eighty Degree Laboratory Freezer for the ISS), relocating the latest blood and urine samples from their current box module in a dewar to another box module in a different dewar. *[Sample vials (separated in bags) were transferred from Dewar 3 to Dewar 2 and from Dewar 1 to Dewar 2.]*

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1). Later tonight, Kononenko transfers the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Progress M-64/29P Line Purging: Two Progress 29P prop line purges are scheduled tonight at ~6:50pm and ~8:30pm. ISS attitude control authority will be handed over from US CMG momentum management to Russian MCS (Motion Control System) thrusters at 6:35pm for the subsequent maneuvers to the line purge attitude (yaw/pitch/roll: 0.0/340.0/0.0). Return to LVLH TEA (Local Vertical/ Local Horizontal Torque Equilibrium Attitude) follows at ~9:00pm and control handover back to US momentum management at ~10:40pm. For the propellant venting, the protective Lab science window shutters will be closed by Gregory at ~6:00pm and not opened until about 1:40am.

EVA-20 Timeline Preview (preliminary): The Orlan EVA-20 by Volkov (EV1) & Kononenko (EV2) on 7/15 is scheduled to begin at ~1:14m EDT (DC1 EV hatch open), to last an estimated 5 hrs 30 min, i.e., concluding at approximately 6:44pm. Part of the EVA will be supported by the DC1-based Strela 1 crane, operated via hand crank. Main objectives of the Russian spacewalk are –

- Closeout ops on Soyuz TMA-12 Plane I inspection/pyrobolt removal (if not completed during EVA-20A);
- Installation of a new docking target on SM PkhO (Transfer Compartment), Plane IV, for MLM (if not completed during EVA-20A);
- Post-installation photography of the new docking target;
- Inspection of mounting holes for an adapter of a Kurs antenna (4AO-VKA) on PkhO-RO (SM Working Compartment, small diameter section);
- Transferring one "Yakor" foot restraint (of two) from the DC1 EVA ladder to the SM and installing it in an attachment socket at a PkhO handrail (two Yakors were installed on DC1 ladder during EVA-17A on 2/22/07);
- Installing the VSPLESK ("Burst") science payload on the SM RO (large diameter section); and
- Removing the BIORISK-MSN (BIO-2) experiment container 1 from the DC1 for return to the station (BIORISK-MSN #1 was installed with two other BIO-2 containers during EVA-19 on 6/6/07).

Uncrewed Station Ops Preview: One of the contingencies associated with the Orlan EVA-20A next week (and EVA-20 on 7/15) could require uncrewed station operation for some time. Most of the US Segment preparations for this eventuality will be done by Gregory Chamitoff next Wednesday (7/9), such as transferring selected hardware to the RS (Russian Segment), setting up a PCS (Portable Computer System) laptop in the FGB as backup to the PCS in the RS, powering down ham/amateur radio equipment, reconfiguring some LAN software (NetMeeting, KFX), powering down the COL PWS (Columbus Orbital Laboratory Portable Workstation) laptop, and closing selected hatches. On 7/10, the IATCS (Internal Thermal Control System) will be configured as usual for uncrewed ops, some racks will be jumpered to the LTL (Low Temperature Loop) in case they need cooling, and some remaining hatches will be closed, before Gregory moves to the Soyuz Descent Module (SA) and closes the hatch between it and the Orbital Module (BO).

CEO (Crew Earth Observations) photo targets uplinked for today were **Mt. Etna** *(this famous European Volcano is located in the eastern part of the island of Sicily. As ISS approached the island from the NW. Greg was to begin looking for the volcano to the E and try for detailed views of the eastern slopes of the volcano between the summit and the coast),* **Red River Basin, TX** *(the Red River is a major tributary of the Mississippi River that also forms the border between the states of*

Texas and Oklahoma. The basin area north of the Dallas-Fort Worth area is primarily an agricultural region that is changing under increasing urban development. As the station approached this area from the NW near midday, Greg was to look for the W-to-E meandering flow of the river and map the area west of the man-made Lake Texoma), and **Santa Barbara Coast, California** *(the coastal area near Santa Barbara, California has been designated as a Long Term Ecological Research [LTER] site. On this pass as ISS approached the coast from the NW, looking just left of track and trying for a detailed mapping strip of the coastal range known as the Santa Inez Mountains from Point Conception to just north of the city of Santa Barbara)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:39am EDT [= epoch]):*
Mean altitude -- 344.8 km
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Perigee height -- 339.1 km
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Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0008523
Solar Beta Angle -- 1.6 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 58 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55094

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/10/08 -- Russian EVA-20A (2:18pm)
07/15/08 -- Russian EVA-20 (1:14pm)
07/18/08 -- ATV1 reboost (tent.)
09/05/08 -- ATV1 undocking, from SM aft port (may move to 9/25)
09/09/08 -- Progress M-64/29P undocking, from FGB nadir (may move to 8/30)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/03/08 -- Soyuz TMA-13/17S relocation
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC

11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
1QTR CY09 -- STS-119/Discovery/15A launch – S6 truss segment
03/25/09 -- Soyuz TMA-14/18S launch
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May '09)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 07/01/08
Date:	Tuesday, July 01, 2008 1:53:22 PM
Attachments:	

ISS On-Orbit Status 07/01/08

All ISS systems continue to function nominally, except those noted previously or below. *>>>Today 46 years ago (7/1/62), Cape Canaveral, FL was established as NASA's Launch Operations Center, under its first director, Dr. Kurt Debus.<<<*

Crew Sleep Cycle: Wake/sleep cycle remains right-shifted (5:30am - 9:00pm EDT).

As part of the crew's regular morning inspection tour, FE-1 Kononenko began his workday with the routine checkup of DC1 (Docking Compartment) circuit breakers and fuses. *[The monthly checkup in the "Pirs" module looks at AZS circuit breakers on the BVP Amp Switch Panel (they should all be On) and the LEDs (light-emitting diodes) of 14 fuses in fuse panels BPP-30 & BPP-36.]*

After resetting STTS communication/telemetry links for their stay in the DC1, Volkov & Kononenko continued preparations for the Orlan EVA-20A on 7/10. Today's focus, supported by ground specialist tagup, dealt with –

1. Configuring an onboard mockup of one of the 10 triangular truss segments between the Soyuz Descent Module (SA) and Instrumentation Compartment (AO) which are holding the twin pyrobolt-equipped locks and pushers for the module separation, and
2. Working with various devices and tools on the mockup to try out and rehearse the removal of a pyrobolt during the EVA-20A. *[Background: Main objective of the spacewalk is the inspection of the Soyuz TMA-12 spacecraft at its first separation plane (Plane I) and the removal of one pyrobolt for return to Earth. Before their separation during entry, SA & AO are connected by five locks, each "zamok" containing two pyrobolts (explosive bolts) with individual electrical connection, of which only one needs to fire to release the lock. The locks are equally spaced around the 360-degree circumference of the separation plane, i.e., 72 deg apart. After the five locks have released, five spring-loaded pushers, also equally spaced, separate the two modules by spring force. Each lock and pusher is located at the apex of two triangularly arranged aluminum*

pipes, i.e., altogether 20 inclined pipes, which make up the open truss structure between the modules. Since not all locks separated nominally during the reentry of Soyuz TMA-11 on 4/19/08, investigations are focusing on the separation mechanisms.]

Afterwards Sergey & Oleg restored the nominal STTS comm settings in the DC1.

FE-2 Chamitoff meanwhile performed the planned FSL (Fluid Science Laboratory) troubleshooting in the Columbus module, going through the procedural steps reviewed yesterday. With the FSL rack powered off and ground support via S- & Ku-Band voice communication & video downlink established, troubleshooting activities called for –

- Removing front gap protections on the FSL rack,
- Opening the FSL drawers,
- Accessing the CEM (Central Experiment Module) E-Box3 and removing its halogen lamp,
- Verifying if the lamp is broken, and, if so,
- Replacing it with a spare unit delivered on 1J, after inspecting the spare for damages or debris, followed by
- Photodocumenting the E-Box3 lamp after installation, and
- Closing the FSL drawers and reattaching the gap protectors.

The FE-1 performed the periodic memory card replacement and functional checkout of the Matryoshka-R (RBO-3-2) radiation payload which is using the ESA/RSC-Energia experiment ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS/ALC) with its Spectrometer (AST) and ALC equipment on FGB panel 429. *[Oleg replaced the ALC-949 PCMCIA (Portable Computer Memory Card International Adapter) card with a new one (#950) for testing the AST to continue Matryoshka operation. He then used the RSK1 laptop for briefly checking the new 950 card after 5-7 min of AST activity for quantity & total size of its stored file, before re-installing it in the AST. Card 949 was stowed for return to earth.]*

Later today, Greg Chamitoff is scheduled to conduct the periodic nitrogen (N_2) pressure check on the MELFI (Minus Eighty Degree Laboratory Freezer for the ISS). *[Nitrogen is the working fluid used by MELFI's cooling system, based on the Reverse Brayton Thermodynamic Cycle. The cooling engine, a Brayton Machine (BM), works with a compression wheel and expansion wheel on the same shaft supported by a gas bearings system. The BM can rotate at speeds up to 96,000 rpm depending on the cooling requirements. After the N_2 is cooled in the BM, it is distributed to each of four independently-controlled, thermally-insulated volumes (Dewars). The N_2 loop is a closed system, i.e., the gas never comes in contact with the samples in the dewars.]*

Sergey Volkov has the task to conduct the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Oleg Kononenko will perform the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1). Later tonight, Kononenko transfers the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

The three crewmembers were scheduled for their regular periodic PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Gregory at ~11:25am, Oleg at ~4:15pm, Sergey at ~5:25pm.

At ~1:00pm EDT, Gregory Chamitoff was interviewed in a 10-min. PAO TV event with KPIX-TV, San Francisco, CA.

CEO (Crew Earth Observations) photo targets uplinked for today were **Mississippi floods** *(Dynamic event. Floods are cresting in the St Louis-Cape Girardeau stretch of the Mississippi River. St Louis harbor is closed to barge traffic. Looking left for the Mississippi River and St Louis. Weather was expected to be "mostly sunny"),* and **Pilcomayo River dynamics, Northern Argentina** *(this ISS pass almost paralleled the course of the failing Pilcomayo River. This river has special geological interest because it is blocking its own course with sediment, and spilling out onto the surrounding flatlands, at the point near where the track crosses the course. Also, this river has built the largest megafan [inland delta] on Earth. Wider views slightly right then left of nadir with the 180 lens will capture the engineering canals put in place by Argentina and Paraguay to maintain flow of the river [which defines the international boundary])*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:14am EDT [= epoch]):*
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Mean altitude loss in the last 24 hours -- 58 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55078

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/02/08 -- Progress 29P line purging
07/10/08 -- Russian EVA-20A (7/10, 2:18pm)
07/18/08 -- ATV1 reboost (tent.)
09/05/08 -- ATV1 undocking, from SM aft port (may move to 9/25)
09/09/08 -- Progress M-64/29P undocking, from FGB nadir (may move to 8/30)
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10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
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3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May ’09)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)

2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/30/08
Date:	Monday, June 30, 2008 12:17:54 PM
Attachments:	

ISS On-Orbit Status 06/30/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 11 of Increment 17.*

Crew Sleep Cycle: Wake/sleep cycle remains right-shifted (5:30am - 9:00pm EDT).

After readying the equipment for the US PHS (Periodic Health Status) w/Blood Labs exam, FE-2 Chamitoff underwent the clinical evaluation as subject, using the PCBA (Portable Clinical Blood Analyzer), assisted by CDR Volkov as CMO (Crew Medical Officer) for the blood draw. The second part of PHS, Subjective Clinical Evaluation, was performed afterwards. All data were then logged on the MEC (Medical Equipment Computer) and the hardware stowed. *[The PHS exam, with PCBA analysis and clinical evaluation, is guided by special software (IFEP, In-Flight Examination Program) on the MEC laptop. While PCBA analyzes total blood composition, the blood's hematocrit is particularly measured by the Russian MO-10 protocol.]*

The CDR serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out"-to-vacuum cycle on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~8:45pm EDT. Filter bed #1 regeneration was performed yesterday. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time done: 6/19&20).]*

Working on the IK0501 GA (gas analyzer), Volkov removed & replaced its O_2 transducer of with a spare unit, located by Kononenko on 6/27, and installed a cap on it. *[Located in the Service Module (SM) behind panel 449, the IK0501 is an automated system for measuring CO_2, O_2, and H_2O in the air as well as the flow*

rate of the gas being analyzed].

In preparation for a possible EVA-related contingency involving Soyuz TMA-12/16S relocation on 7/11, FE-1 Kononenko dismantled and removed electronic equipment from the spacecraft's Orbital Module (BO), to be re-installed after a nominal spacewalk. *[Removed were the LKT local temperature sensor commutator (TA251MB) of the BITS2-12 onboard telemetry measurement system and its PZU-1M ROM (read-only memory) unit. When a Soyuz departs or a Progress is jettisoned, these valuable electronics are retained, to be recycled on a future vehicle.]*

Volkov & Kononenko had two hours set aside for an in-depth review of the EVA-20a timeline, watching an uplinked video and tagging up with ground specialists view S-band. *[The off-nominal scenario of the crew training involves the case where the DC1 Docking Compartment fails to repressurize after ingress of the two spacewalkers on 7/11. This would necessitate their ingress in the Soyuz and the relocation of the spacecraft, docked to the DC1 nadir port with FE-2 Chamitoff already safely locked out in the 16S Descent Module, to the FGB nadir port after prior separation of the Progress cargo ship. In addition, for the relocation the three crewmembers and the spacecraft will have to be prepared for a return to Earth in the event of a no-docking contingency, and the station will have to be configured for uncrewed operation. The off-nominal scenario currently assumes the following timeline on 7/11 (EDT):*

- *12:20pm: Attitude control handover from USOS CMGs to RS thrusters;*
- *12:30pm: Maneuver to Progress 29P undocking attitude;*
- *1:14pm: 29P undocking from FGB nadir port;*
- *4:13pm: Free drift for Soyuz 16S hooks opening;*
- *5:40pm: Maneuver to 16S undock attitude;*
- *6:27pm: 16S undocking for relocation to FGB nadir port;*
- *6:56pm: 16S docking at FGB nadir port; 8:10pm: Attitude control authority handover from RS to USOS.]*

After the review, the CDR & FE-1 had another 90 min for preparing EVA-20a equipment and gathering the necessary tools.

Also in preparation for the Orlan spacewalk, Sergey & Oleg are scheduled later today for the mandatory Russian pre-EVA MedOps procedure MO-6 (hand-cycle ergometry) in the SM, assisting each other in turn and supported by tagup with ground specialists who are to clear them for spacewalking. *[Because cosmonauts in early Russian programs have shown noticeable decrease in arm muscle tone, TsUP/IBMP (MCC-Moscow/Institute of Biomedical Problems) physical fitness experts have groundruled the handgrip/arm tolerance test analysis (hand*

ergometry) as a standard pre-Orlan EVA requirement. For MO-6, the subject dons the ECG (electrocardiogram) biomed harness, attaches three skin electrodes and plugs the harness into the PKO medical exam panel on the cycle ergometer. The other crewmember assists. The 30-min exercise itself starts after 10 seconds of complete rest, by manually rotating the cycle's pedals, set at 150 W, backwards until "complete exhaustion".]

Getting ready for tomorrow's planned troubleshooting of Columbus science equipment, Gregory Chamitoff reviewed CBT (Computer-Based Training) material on the procedures required to safely access and investigate the FSL (Fluid Science Laboratory) in COL (Columbus Orbital Laboratory). *[With the FSL rack powered off, troubleshooting steps include FSL drawer opening, inspecting the CEM (Central Experiment Module), checking out the nonfunctional CEM halogen lamp in the E-Box3, taking photographs of the E-Box3, replacing the lamp with a 1J-delivered spare unit (if found broken) and re-closing the drawers.]*

Chamitoff later set up the payload equipment for his second session with the 3D-Space (Mental Representation of Spatial Cues During Space Flight) experiment and then performed the protocol, with all three exercises (distance, illusion, handwriting). After all data were stored on PCMCIA memory card, the ESA multipurpose laptop was shut down and the hardware disconnected & stowed away. *[3D-SPACE, a collaboration of ESA and the French space agency CNES (Centre National de la Recherche Scientifique), is designed to identify accurate visual perception & localization of objects in the space environment as prerequisites for spatial orientation & reliable performance of motor tasks in microgravity. Humans have mental representations of their surroundings based on sensory information & experience. It is hypothesized that depth & distance perception of objects could be altered in space due to the absence of gravitational reference and ambiguous perspective cues. 3D-SPACE investigates (a) depth perception & the role of perspective cues using geometric illusions, (b) distance perception using both standard psychophysics tests & natural three-dimensional scenes presented on a virtual reality head-mounted display, and (c) the effects of cognitive vs. perceptual-motor changes using handwriting & drawing tests.]*

After the recent (6/16) water transfer from the WDS (Water Delivery System) of ATV1 "Jules Verne" to an EDV container in the SM for the Elektron electrolysis system, FE-1 Kononenko today again used the electric pump with water transfer hoses & pressure adapter for pumping over more water from WDS tank #1 to an empty EDV.

Gregory conducted the periodic offloading of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1054) with the collected water slated for processing. No samples were

required. *[Estimated offload time before reaching the tank's neutral point (leaving ~6 kg in the tank): ~30 min. Condensate collection continues to be performed by the CCAA while the Russian SKV-2 air conditioner is off, awaiting its overdue Khladon (Freon-218) refill. SKV-1 has been nonfunctional for a long time.]*

Continuing his systems checkout activities in the Kibo JEM (Japanese Experiment Module), today on the CGSE (Common Gas Support Equipment), the FE-2 made connections between its valve unit and four CO_2 & Argon GBUs (gas bottle units), then opened the CO_2 gas supply to check out the system.

Later today, Greg will also take down the VAJ (Vacuum Access Jumper) connections set up by him on 6/19 from the Kibo WG (Waste Gas) and VV (Vacuum Vent) for initial VV exhaust gas activation.

Sergey Volkov has the task to conduct the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Oleg Kononenko will perform the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1). Later tonight, Oleg transfers the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

The FE-2 again had the option of spending about an hour for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residence, if she/he chooses to take it.

BCC Checkout: Last night, the ground initiated the two-hour standard checkout of BCC (Backup Control Center) Swing and Activation procedures that would be necessary in the event of a flight control transfer from Houston to the HSG (Houston Support Group) at TsUP/Moscow. The checkout, which did not involve the crew, included PPCP (PrePlanned Command Package) and real-time command uplinks

from MCC-H via RS ground station (DO4; ~1:40am). *[Purpose of the BCC C/O is to demonstrate BCC functionality and provide proficiency training for HSR (Houston Support Room) personnel. Objectives are: successful swing to BCC, command verification via PPCP transmission and real-time command uplink, and ACT (American Contingency Telemetry) verification.]*

CDRA Update: Starting at ~9:00am this morning, the US Carbon Dioxide Removal Assembly was activated again for two half-cycles to control $ppCO_2$ levels. In this configuration for the daily ops, connecting & disconnecting the ITCS cooling loop is not required. A forward plan for cycling the CSV (CO_2 Selector Valve) to prevent its sticking is in work.

Voluntary Science (VolSci) Update: Words of thanks and appreciation were uplinked to Gregory Chamitoff from POIC (Payload Operations & Integration Center, Huntsville) ground specialists for his outstanding job yesterday in setting up the new SHERE (Shear History Extensional Rheology Experiment) experiment in the MSG (Microgravity Science Glovebox), including video configuration and software upload, plus overcoming some minor data comm problems.

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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Eccentricity -- 0.0008497
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Mean altitude loss in the last 24 hours -- 68 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55062

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07/10/08 -- Russian EVA-20a (7/10, 2:18pm)
07/18/08 -- ATV1 reboost (tent.)
09/05/08 -- ATV1 undocking, from SM aft port (may move to 9/25)

09/09/08 -- Progress M-64/29P undocking, from FGB nadir (may move to 8/30)
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10/01/08 -- **NASA 50 Years**
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1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/29/08
Date:	Sunday, June 29, 2008 12:20:15 PM
Attachments:	

ISS On-Orbit Status 06/29/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday -- off-duty for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff. Ahead: Week 11 of Increment 17.*

Crew Sleep Cycle: Wake/sleep cycle currently remains shifted to the right (5:30am - 9:00pm EDT).

The FE-1 performed the periodic service of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed 1 of the regenerable dual-channel filtration system. The regen process will be terminated before sleeptime, at ~8:30pm EDT. Bed 2 regeneration follows tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time: 6/19&20).]*

The CDR conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Volkov also gathered weekly data on Total Operating Time & "On" durations of the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem for reporting to TsUP.

For his Voluntary Weekend Science (VolSci) program today, FE-2 Chamitoff has

selected a session with the new SHERE (Shear History Extensional Rheology Experiment) payload, first reviewing familiarization material, then going through the individual procedural steps of activating the MSG (Microgravity Science Glovebox), gathering SHERE hardware for assembly in the MSG WV (Work Volume), setting up the camcorder equipment to take video of the assembly, powering up & starting the experiment and loading the updated software in the MSF laptop. Afterwards, the experiment will be terminated and everything powered down. *[SHERE, which has never before been performed in micro-G, studies the effect of preshearing (rotation) on the stress and strain response of a polymer fluid (a complex fluid containing long chains of polymer molecules) being stretched in micro-G. The fundamental understanding & measurement of the extensional rheology of complex fluids is important for understanding containerless processing, an important operation for fabrication of parts (such as adhesives or fillers) using elastomeric materials on future exploration missions. This knowledge can be applied as well to controlling and improving Earth-based manufacturing processes.]*

Later today, the FE-2 will also break out and set up the equipment for tomorrow's scheduled U.S. PHS (Periodic Health Status) w/Blood Labs exam, a clinical evaluation of Chamitoff as subject, with Sergey Volkov assisting as CMO (Crew Medical Officer) for the blood sampling part. *[The task today included an electronic function test and control analysis of the blood lab equipment, viz., the PCBA (Portable Clinical Blood Analyzer), which was then temporarily stowed.]*

At ~3:10pm, Gregory is scheduled for weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

Working off his suggested "time permitting" task list, the CDR performed another session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program using the HVR-Z1J SONY digital cameral. *[Uploaded target zones today were the Alps, glaciers above the arch-shaped dams on the south (left) slope of Rhone river falling into Lake of Geneva from the west, Allaline Glacier (7.37E; 46.00S), Balkan coast line, close-up views of Greece and her islands, fires (Athens), general video views of major faults of Earth's crust – rifts in Africa stretched along rock-basin lakes, and the Indian Ocean coastline.]*

Also from the Russian discretionary task list, Volkov conducts another run, his seventh, of the Russian DZZ-2 "Diatomeya" ocean observations program, using the NIKON-F5 DCS still camera and the HDV (high-definition) video camcorder from SM window 8 for ~20 min to record color contrast blooms and cloud patterns in flight path. *[The spring & summer seasons in the Northern Hemisphere are distinguished by very strong bio-productive developments in the waters of North Atlantic. At this time the largest currents, upwelling areas, and near-estuary areas*

of the ocean should display large-scale spots and bands of green and greenish-brown fields of plankton. Target zones today in the North Atlantic were waters off Newfoundland Island, the coastal area of Morocco plus US and Venezuelan coastal areas.]

For Oleg Kononenko, the voluntary task list suggested another ECON KPT-3 session for today, making observations and taking aerial photography of environmental conditions for Russia's Environmental Safety Agency (ECON) using the Nikon D2X digital camera with SIGMA 300-800mm telephoto lens.

For Greg, a new job on the voluntary "job jar" task list for today called for a CBT (Computer-Based Training) session of upcoming troubleshooting activities on the failed COL FSL (Columbus Orbital Laboratory/Fluid Science Laboratory). *[The CBT, hard-scheduled tomorrow, focuses on operations overview, safety aspects, CEM Upper (Central Experiment Module), softshield CEM, and the halogen lamp unit.]*

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

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09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/03/08 -- Soyuz TMA-13/17S relocation
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
1QTR CY09 -- STS-119/Discovery/15A launch – S6 truss segment
03/25/09 -- Soyuz TMA-14/18S launch
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May '09)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/28/08
Date:	Saturday, June 28, 2008 12:10:06 PM
Attachments:	

ISS On-Orbit Status 06/28/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – off duty for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff.*

Crew Sleep Cycle Adjustments: Crew wake/sleep cycle today shifted 3.5 hrs to the right for the next days: wakeup – 5:30am, sleep – 9:00pm EDT.

Upon wake-up, Sergey Volkov terminated his 5th MBI-12 SONOKARD experiment session for the long-term Russian sleep study, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the Service Module (SM) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

As part of the house cleaning, the crew also conducted regular maintenance inspection & cleaning on fan grilles in the FGB (TsV2), SM (VPkhO & VPrK), DC1 (V1, V2, V3) screens and PF1/PF2 dust filters, as well as in the COL (Columbus

Orbital Laboratory).

Gregory Chamitoff filled out the regular FFQ (Food Frequency Questionnaire), his third, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

At ~10:10am EDT, the crewmembers held their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

Afterwards, Chamitoff transferred the crew's exercise data file to the MEC for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

The Russian crewmembers had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Sergey at ~11:00am, Oleg at ~11:45am.

Working off his suggested "time permitting" task list, CDR Volkov performed another session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program using the HVR-Z1J SONY digital cameral. *[Uploaded target today was Darwin Island (-92.0E; 1.7S), one of the islands in the Galapagos Archipelago.]*

For FE-1 Kononenko, the Russian voluntary task list suggested another ECON KPT-3 session for today, making observations and taking aerial photography of environmental conditions for Russia's Environmental Safety Agency (ECON) using the Nikon D2X digital camera with SIGMA 300-800mm telephoto lens.

CDRA Activity: The US Carbon Dioxide Removal Assembly was activated by ground commanding at ~9:00am for two half-cycles, until $ppCO_2$ had dropped below ~4.5 mmHg, then turned off again. Crew support consisted in deactivation of the ARS (Atmosphere Revitalization Systems) rack.

Airlock (A/L) CCAA Activity: Also by ground commanding, the THC CCAA (Temperature & Humidity Control/Common Cabin Air Assembly) air conditioner in the "Quest" A/L was deactivated after running for at least 6 hrs. *[Per Flight Rule, when A/L CCAA is activated following a seven-day inactive period, it must be operated a minimum of 6 hrs continuously without water carryover before being shut down. The CCAA may thereafter remain inactive for 7 days with the LTL (Low Temperature Loop) set point below the USOS (U.S. Segment) dew point.]*

Weekly Science Update *(Expedition Seventeen -- Week 10)*

3-D SPACE : After a successful session on 6/13, the second session for the FE-2 is currently planned for 6/30.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Measurements continue in FGB module.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Samples returned on 1J.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): The CGBA Ops team is hoping to run Side 1 of Silicate Garden Hab (S/N 2) in the next couple of weeks to collect data for the upcoming school year. No crew action needed.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): The experiment platform continues to operate nominally. The instruments and its power feeder #1 have been de-activated on 6/21 because of planned power outage in ERASMUS USOC. Afterwards the EuTEF instruments have been re-activated nominally. A DHPU (Data Handling Processing Unit) software patch is currently being developed to fix the link error issues encountered with DEBIE-2 and FIPEX instruments. -- DEBIE-2: Link error still in work. However a work-around allows for regular science data acquisition using an on-board IOP (Instrument Operations Procedure); -- DOSTEL: On-going science acquisition; -- EuTEMP: Currently inactive as planned; -- EVC: still under investigation. On 0/23, a link with the HRM could successfully be established; -- EXPOSE: On-going science acquisition; -- FIPEX: It was noticed that a script run during Week 10 had to be repeated as the data file was corrupted. The file has been deleted and a new script has been started on 6/25, containing fast measure program with 3 sensors; -- MEDET: Some commanding was performed on 6/23 to increase the frequency of acquisition of the microcalorimeter. Commands to bring back to the initial value were sent on 6/24. Continuously acquiring science data; -- PLEGPAY: currently in READY mode, no science data acquisition on-going; -- TRIBOLAB: The Ball-Bearing experiment 1/2/3 which is running since 6/16 has been paused during the EUTEF power-down on 6/21 and has been resumed since. The experiment run is expected to last until ~7/18-20.

FSL (Fluid Science Laboratory): Further troubleshooting activities on FSL are planned for 7/1.

GEOFLOW: The start of GEOFLOW is pending further FSL troubleshooting and remaining commissioning activities (check of FSL optical modes).

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Node-1 surfaces were expected to contain little/no fungal material, but Greg's 2nd swab contained 18 ng/ml of the fungal cell wall molecule 'Glucan' (within the 1-100 ng/ml detection range of the instrument). This level is not a concern for crew health on the ISS and probably represents dead residual fungal material killed during cleaning. However, such a reading might be a scientific concern if obtained during a human exploration mission to Mars, where biological material on internal surfaces could be transferred to the outside, e.g. during EVA. This transfer could interfere with experiments designed to search for biological molecules indigenous to the Martian surface. Chamitoff's ISS results are helping scientists define requirements for spacecraft "cleanliness", which need to be in place for these exploration missions.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 "Pirs".

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION w/REPOSITORY: In progress.

PADLES (Passive Dosimeter for Lifescience Experiment in Space): In progress.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Inc16 samples have been downloaded with 15S and handed over to science team.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): "Greg, thanks for completing your Actiwatch initialization. If you find your other Actiwatch, please let us know so we can coordinate the downloads of both Actiwatches into

the timeline for your next session."

SOLAR (Solar Monitoring Observatory): Sun observation window was expected to open on 6/24, however the sun was not sufficiently visible to start measurements. On 6/25, the SOLAR platform has been reconfigured to PM (Pointing Mode). After a while, however, the HK data were lost. Some test on 6/25 and power cycles on 6/25 & 26 have not resolved the problem. The issue appears to be related either to the LAN or to an internal process of SOLAR not sending HK packets. The instruments are currently switched off. Currently under further investigation.

SOLO: Planned.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): In progress.

CEO (Crew Earth Observations): Continuing.

CEO (Crew Earth Observations) photo targets uplinked for Greg Chamitoff for today were **Mount Rainier** *(detailed images of Mt. Rainier, right of track, were requested. This active volcano lies immediately behind Seattle),* **Yellowstone National Park, Wyoming** *(detailed images were requested for information about roads and trails. Mapping series of overlapping images left of track was requested. Yellowstone Lake was in the center of the view and the NP),* and **South Amazonian Fans, Brazil** *(this site is almost never called out due to cloudiness [forecast was mostly clear for today]. The Aripuana River and its neighbor in central Amazonia have created vast fan-shaped features ["inland deltas," – polygon]. Research is centering on old channels which appear as a series of sinuous white lines: aiming the lens left and right of track to acquire a mapping swath of images. Visual cues were a highway and the Madeira River on one side and the Trans-Amazon Highway on the other. JSC geologists are investigating inland deltas worldwide as analogs for similar features on Mars).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the

Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:37am EDT [= epoch]):*
Mean altitude -- 345.1 km
Apogee height -- 350.8 km
Perigee height -- 339.5 km
Period -- 91.44 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0008414
Solar Beta Angle -- -13.7 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 100 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55031

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/10/08 -- Russian EVA-20a (7/10, 2:18pm)
09/05/08 -- ATV1 undocking, from SM aft port (may move to 9/25)
09/09/08 -- Progress M-64/29P undocking, from FGB nadir (may move to 8/30)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
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11/03/08 -- Soyuz TMA-13/17S relocation
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
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11/28/08 -- Progress M-66/31P docking
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
1QTR CY09 -- STS-119/Discovery/15A launch – S6 truss segment
03/25/09 -- Soyuz TMA-14/18S launch
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
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05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May ’09)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)

2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/27/08
Date:	Friday, June 27, 2008 11:45:58 AM
Attachments:	

ISS On-Orbit Status 06/27/08

All ISS systems continue to function nominally, except those noted previously or below. *Half-day rest for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff.*

Crew Sleep Cycle Adjustments: Crew wake/sleep cycle today is back on normal (2:00am-5:30pm) but will shift forward again starting tomorrow morning, by 3.5 hrs, throughout next week for the Orlan EVA on 7/10: wakeup – 5:30am, sleep – 9:00pm EDT.

Oleg Kononenko started his workday by taking the periodic readings of potentially harmful atmospheric contaminants in the SM (Service Module), using the CMS (Countermeasure System), a component of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, which uses preprogrammed microchips to measure H_2CO (Formaldehyde, methanal), CO (Carbon Monoxide) and NH_3 (Ammonia), taking one measurement per microchip. Today's measurements also looked for O_3 (Ozone), C_6H_6 (Benzene) and NO_2 (Nitrogen Dioxide), using special chips. *[CMS is a subsystem of the Russian SKDS Pressure Control & Atmosphere Monitoring System.]*

Later, the FE-1 used the SOGS GANK-4M system for taking and recording atmospheric readings. *[GANK tests for Methane (CH_4), NH_3, CO, H_2CO, Nitrogen Oxides (NO, NO_2), Hydrogen Chloride (HCl), Hydrogen Fluoride (HF), and Hydrogen Cyanide (HCN).]*

Kononenko also conducted a search for a spare O_2 transducer for the IK0501 GA (gas analyzer), and a cap to install on it. *[IK0501 is an automated system for measuring CO_2, O_2, and H_2O in the air as well as the flow rate of the gas being analyzed]*.

Before sleep time tonight, the CDR will take measurements for the regular atmospheric status check for $ppCO_2$ (Carbon Dioxide partial pressure) in the Lab, SM (at panel 449) and COL (Columbus Orbital Laboratory), using the hand-held CDMK (CO_2 Monitoring Kit, #1002). *[The battery pack is to be replaced with the one from unit #1009 if necessary.]*

For Gregory Chamitoff, it was Day 2 of the two-day IFM (Inflight Maintenance) for refilling the two coolant loops of the ITCS (Internal Thermal Control System). *[After first backing out of the safety steps put in place last night, the FE-2 then used the FSS (Fluid System Servicer) with its FCPA (Fluid Control Pump Assembly) to charge the LTL & MTL PPA (Low Temperature Loop & Moderate Temperature Loop Pump Package Assembly) accumulators as well as the spare ITCS CSA (Coolant Sampling Adapter). Afterwards, the FSS plus jumpers were drained and purged to vacuum, then stowed away. The coolant refill of the accumulators became necessary due to the recent installation of the Lab AmiA (Antimicrobial Applicator) by Karen Nyberg during 1J and the leak at the LTL supply QD (Quick Disconnect). The PPAs are located in the LAB1P6 & LAB1S6 racks. The refill of the spare CSA anticipates its use in the Kibo JPM: since both JEM ITCS CSAs were deleted from the 1J manifest, the plan is to eventually install the spare onboard CSA in the JPM to take samples until the JEM Adapters are delivered on a later mission.]*

Chamitoff also conducted the monthly FDS PEP (Fire Detection & Suppression/ Portable Emergency Provisions) safety inspection/audit in the ISS modules. *[Today's inspection also covered the QDMA (Quick-Don Mask Assembly) harnesses, including those that had not been unpacked yet. In addition, photo documentation of all PBA (Portable Breathing Apparatus) and PFE (Portable Fire Extinguishers) gauges was required. The IMS (Inventory Management System)-supported inspection involves verification that PFEs, PBAs, QDMAs and EHTKs (Extension Hose/Tee Kits) are free of damage to ensure their functionality, and to track shelf life/life cycles on the hardware.]*

Volkov & Chamitoff completed another monthly session (Sergey's third, Gregory's first) of the CHeCS (Crew Health Care Systems) emergency medical operations OBT (On-Board Training) drill, a 30-min. exercise to refresh their CMO (Crew Medical Officer)'s acuity in a number of critical health areas. Sergey's proficiency drill today focused on nosebleed treatment, Greg's on eye treatment. *[The HMS (Health Maintenance Systems) hardware, including ACLS (Advanced Cardiac Life Support) equipment, may be used in contingency situations where crew life is at risk. To maintain proficiency, crewmembers spend one hour per month reviewing HMS and ACLS equipment and procedures via the HMS and ACLS CBT (computer-based training). The training drill, each crewmember for him/herself, refreshes their memory of the on-orbit stowage and deployment locations, equipment etc. and*

procedures.]

CDR Volkov had another 30 min reserved for relocating and stowing common trash into the ATV1 (Automated Transfer Vehicle) “Jules Verne”.

Continuing the extended leak checking of the spare BZh Liquid Unit (#056) for the Elektron O_2 generator, Kononenko charged the unit once again with pressurized N_2 from the BPA Nitrogen Purge Unit (#23) to 1 atm (1 kg/cm^2). The last test pressurization to monitor for leakage was on 5/22. *[During Elektron operation, the inert gas locked up in the BZh has the purpose to prevent dangerous O_2/H_2 mixing. A leaking BZh cannot be used.]*

Continuing Orlan preparations for the spacewalk on 7/10, Oleg installed the battery for powering the US wireless TV camera (ERCA/EMU RF Camera Assembly) in the BRTA-1M telemetry systems unit of Orlan-M suit #26, with cable routing, then covered BRTA-1M & cables with MLI (Multi-Layered Insulation), fastened down with Kapton tape.

On the US REBA (Rechargeable EVA Battery Assembly), also used on the Orlan, the FE-1 worked with Kapton tape, scissors and tape measure to jerry-rig an extension for the pull tab of the REBA which allows activation of the battery once it is installed in the Orlan.

Volkov performed the daily IMS maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Kononenko completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

The crew worked out according to their regular 2.5-hr. physical exercise protocol (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exerciser (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). Afterwards, Oleg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

This morning at ~4:15am EDT the CDR & FE-1 linked up with TsUP-Moscow stowage specialists via S-band to conduct the weekly IMS tagup, discussing

stowage issues, equipment locations, Progress cargo transfers and ATV trash stowage.

At ~4:25am, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU/*Glavnaya operativnaya gruppa upravleniya = "Main Operative Control Group"*), including Shift Flight Director (SRP), at TsUP-Moscow via S-band/audio, phone-patched from Houston and Moscow.

At ~9:00am, Sergey & Oleg downlinked a PAO TV message of greetings and congratulations to an International Conference on Mental Recovery, to be held on July 2-4 in Moscow, organized by Academician N. N. Burdenko of the Scientific & Research Institute of Neurosurgery at M. V. Lomonosov Moscow State University, and the World Federation of Neurosurgical Societies. *["…Space and the human brain are the two vast, hardly fully researched universes, requiring more studies to discover the essence of all their processes. To reach their goals, space researchers and brain scientists-neurosurgeons, are taking advantage of cutting-edge technology and procedures. Some are looking into the depths of the Universe, trying to resolve the mysteries of planets and interstellar matter. The others are trying to learn about higher mental functions and dynamics on the cellular and molecular levels. We, the cosmonauts, are always aware of the doctors' attention to our health, well-being, and mental state. It is a well-known fact that medical doctors participated in numerous flights aboard space vehicles and orbital stations. We always assist our colleagues in conducting medical space experiments, in human bio-medical research in space flight… We wish you new scientific discoveries and tangible achievements, every success in your noble activities, good health, well-being, happiness and prosperity to you and your loved ones."]*

At ~4:00pm, the ISS crew is scheduled for their regular weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC (Station Support Computer)]*.

At ~5:20pm, getting ready for sleep time, Sergey will again set up the Russian MBI-12 SONOKARD (Sonocard) payload and start his 5th experiment session, using a sports shirt from the SONOKARD kit with a special device in the pocket for testing a new method for acquiring physiological data without using direct contact on the skin. Measurements are recorded on a data card for return to Earth. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

WRM Update: An updated Water Recovery Management "cue card" was uplinked overnight for the crew's reference. *[The new card (17-0002O) lists 36 CWCs (~1365.2 L total) for the four types of water identified on board: technical water (650.6 L, for Elektron, flushing, hygiene, incl. 509.4 L non-usable water because of Wautersia bacteria), potable water (706.7 L, incl. 260.6 L currently on hold), condensate water (0 L), waste/EMU dump and other (7.9 L). Wautersia bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

ATV Hygiene Use: Due to some health concern about microbial/fungal growth in the FGB, an agreement has been reached with ESA to allow crewmembers to perform their hair and body washing in the ATV1 (away from sensitive equipment) as long as it is available. Other hygiene activities (shaving, hair cutting, fingernail clipping, etc.) will continue to be done near air filter intakes elsewhere on the station, not in the ATV.

EVA-20a Timeline Preview: The Orlan EVA-20a by Volkov/EV1 & Kononenko/EV2 on 7/10 is scheduled to begin at **~2:18pm EDT** (DC1 EV hatch open), to last an estimated 6 hrs. During the spacewalk, EV2 will be riding on the DC1-based Strela 1 crane, operated via hand crank by EV1. Main objective is the inspection of the Soyuz TMA-12 spacecraft at its first separation plane (Plane I) followed by removal of one pyrobolt for return to Earth. Before removing the separation bolt, Oleg will install temporary protective covers on the spacecraft's DPO attitude control thrusters, open up the MLI (Multi-Layer Insulation), demate the pyrobolt's electrical connector and cut the wiretie between the pyrobolts. MLI will then be reattached and the covers removed again. If enough time remains after the Soyuz activity, the spacewalkers will also install a docking target (for the new MEM module) on the SM PkhO (Transfer Compartment) exterior.
[Background: Before their separation, Descent Module (SA) & Instrumentation Compartment (AO) are connected by five locks, each "zamok" containing two pyrobolts (explosive bolts) with individual electrical connection, of which only one needs to fire to release the lock. The locks are equally spaced around the 360-degree circumference of the separation plane, i.e., 72 deg apart. After the five locks have released, five spring-loaded pushers, also equally spaced, separate the two modules by spring force. Each lock and pusher is located at the apex of two triangularly arranged aluminum pipes, i.e., altogether 20 inclined pipes, which make up the open truss structure between the modules.]

CEO (Crew Earth Observations) photo target uplinked for today was **St. Louis, Mississippi floods** *(Dynamic event. Sun and cloud with isolated thunderstorms are forecast for the Mississippi valley in the vicinity of St Louis. Looking left for the Mississippi River floodplain where many counties are under flood warnings north of*

St. Louis, and now increasingly south of St. Louis.)

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:12am EDT [= epoch]):*
Mean altitude -- 345.2 km
Apogee height -- 351.1 km
Perigee height -- 339.3 km
Period -- 91.44 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0008808
Solar Beta Angle -- -16.9 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 60 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 55015

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/10/08 -- Russian EVA-20a (7/10, 2:18pm)
09/05/08 -- ATV1 undocking, from SM aft port (may move to 9/25)
09/09/08 -- Progress M-64/29P undocking, from FGB nadir (may move to 8/30)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/03/08 -- Soyuz TMA-13/17S relocation
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
1QTR CY09 -- STS-119/Discovery/15A launch – S6 truss segment
03/25/09 -- Soyuz TMA-14/18S launch
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/27/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May '09)**

3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/26/08
Date:	Thursday, June 26, 2008 2:22:27 PM
Attachments:	

ISS On-Orbit Status 06/26/08

All ISS systems continue to function nominally, except those noted previously or below.

*>>>>Today at ~9:55am EDT, the ISS (specifically its FGB module) completed **55,000 orbits** of the Earth, having covered a distance of 2.32 billion kilometers (1.45 billion st.miles) in 3506 days. The 19,300 kg (42,600 lbs) Zarya ("Dawn") was launched on a Russian/Khrunichev Proton from Baikonur over 9.5 years ago (11/20/98) as the first element of the multi-national space station.<<<<*

Current sleep cycle: Crew wakeup last night: 11:00pm EDT; sleeptime today: 3:30pm. Wakeup tomorrow: back at 2:00am, for a half-duty day.

Crew activities focused on a thorough Orlan systems checkout and suited exercise in preparation for the EVA-20a on 7/10. The successful Orlan-suited dry run demonstrated that in the case of a contingency situation during the spacewalk, the crew would be able to ingress the Soyuz module while still in their Orlan suits. The activities were recorded on VTR (Video Tape Recorder) by camcorder equipment set up by FE-2 Chamitoff. *[Plans for live TV downlink during the run had to be scrapped because a necessary drag-through cable could not be located in time.]*

After breakfast and DPC (daily planning conference), CDR Volkov & FE-1 Kononenko proceeded with the suited dry run, beginning with disassembly and removal of the SOTR ventilation air ducts between the SM PkhO (Service Module Transfer Compartment) & DC1 (Docking Compartment) and between the DC1 SU (vestibule) and Soyuz BO (Orbital Module), to gain room for the suited translation exercises.

With the STTS communications links configured for S/G (Space-to-Ground) for their stay in the DC1 & BO and fresh batteries installed in the BRTA telemetry comm

units of both Orlan-Ms (#26 & #27), the two spacewalkers checked out the suits, their equipment and BSS interface units via USI data output device. *[All EVA preps were monitored by TsUP/Moscow via S-Band and VHF.]*

Donning of EVA gear began at ~2:30am, starting with checkout of the comm hookups & biomedical parameter telemetry via BSS support panel and equipment monitoring, then culminating in complete ingress in the Orlans at ~3:00am and closure of backpacks.

DC1 hatch closing (isolation) and start of partial depress for subsequent leak checks was timelined at ~4:00am but conducted ahead of schedule, followed by a functionality checkout of the suits and their BSS controls, preliminary fit checks at 0.4 atm (5.9 psi) suit pressure, and about an hour of testing/training of suited mobility & translation. *[The suited mobility & translation exercises included moving to VL1 (EVA hatch #1), translating to the EVA support panel (POV), BSS and SU-BO hatch (closed but not latched), checking out rotation capability with and without lights on, moving payload bundles, operating with OTAs (Orlan tether assemblies), plus operating the PGPU pneumohydraulic control panel and switching to autonomous suit power.]*

Sergey & Oleg then moved through the DC1 SU hatch into the Soyuz BO Module and closed the hatch to the DC1 (no comm while suited), then started depressurizing the Orlans and finally doffed the suits, re-establishing comm through Soyuz systems.

Orlan egress was ahead of schedule, followed by a 2h 20m period of post-training cleanup activities. *[These include changing clothes, drying out LCG (liquid cooling garment), biomed harness belt, thermal undergarment, socks, comfort gloves, hygienic trunks and comm caps, removing LiOH canister and moisture collector, etc., restoration of STTS communications settings to nominal operation, re-installation of the air duct between SM PkhO and DC1, and replacing the BRTA telemetry unit batteries for both suits (always for immediate readiness).]*

FE-2 Chamitoff monitored the training activities from the SM. *[During the actual EVA, Gregory will be located in the Soyuz Descent Module (SA), with the BO/SA hatch closed.]*

Later, Chamitoff had ~2 hrs reserved for performing Part 1 of the planned IFM (Inflight Maintenance) task on the ITCS (Internal Thermal Control System), first clearing the work area in the Lab by moving obstructing stowage to temporary locations and relocating (but not disconnecting) File Server, MEC (Medical Equipment Computer), Printer, and SSC (Station Support Computer) Client laptops as needed, then setting up the FSS (Fluid System Servicer) and priming (filling) the

FSS, consisting of the FCPA (Fluid Control Pump Assembly) with jumpers, and the ITCS CSA (Coolant Sampling Adapter). *[Since FSS ops are scheduled over two days, today's procedures also included steps for overnight safing of the FSS. Day 2 activities tomorrow will focus on the actual refilling of the LTL & MTL PPA (Low Temperature Loop & Moderate Temperature Loop Pump Package Assembly) accumulators as well as the space ITCS CSA, draining the FSS & FSS jumpers drained plus purging them to vacuum FSS jumpers, and finally stowing everything. The coolant refill of the accumulators became necessary due to the recent installation of the Lab AmiA (Antimicrobial Applicator) by Karen Nyberg during 1J and the leak at the LTL supply QD (Quick Disconnect). The PPAs are located in the LAB1P6 & LAB1S6 racks. The refill of the spare CSA anticipates its use in the Kibo JPM: since both JEM ITCS CSAs were deleted from the 1J manifest, the plan is to eventually install the spare onboard CSA in the JPM to take samples until the JEM Adapters are delivered on a later mission.]*

Gregory also conducted the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WRM (Water Recovery & Management (WRM)) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week. The current card (17-0002N) lists 36 CWCs (~1484.9 L total) for the four types of water identified on board: technical water (694.6 L, for Elektron, flushing, hygiene, incl. 553.4 L non-usable water because of Wautersia bacteria), potable water (706.7 L, incl. 260.6 L currently on hold), condensate water (75.7 L), waste/EMU dump and other (7.9 L). Wautersia bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

In the US Airlock, Oleg Kononenko initiated recharge on the REBAs (Rechargeable EVA Battery Assemblies) and helmet light batteries in the BSA (Battery Stowage Assembly), for use on the Orlans during the EVA-20a. Recharge was terminated after about 5.5 hrs.

The FE-2 worked out according to his regular 2.5-hr. physical exercise protocol (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill and RED resistive exerciser. Afterwards, Greg transferred the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~11:50am EDT, Gregory participated in an interactive TV PAO/Educational event with Burleson Independent School District, Burleson, TX, responding to questions asked by the students of Burleson High School. *[The primarily rural Burleson, TX district highlighted the downlink around an existing summer science & technology camp for students called "All Systems Go." Greg's downlink, which allowed*

students in grade levels 5-8 an opportunity to ask questions about the ISS and living and working in a microgravity environment, provided a stage to spotlight math & science to the surrounding community, and the district looked to establish new partnerships within their community as a result.]

Chamitoff completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Working off the Russian discretionary "time permitting" task list, Kononenko was to perform the daily IMS (Inventory Management System) maintenance, updating/ editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Still remaining on the voluntary task list item for Kononenko & Volkov was an audit of expired Expedition 16 food rations, with repacking & preparation of food packages for disposal on the ATV1. *[To clear storage space for cargo items delivered on Progress M-64/29P.]*

The FE-2 again had the option of spending about an hour for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residence, if she/he chooses to take it.

PPS P6 Battery Capacity Test: The capacity testing on the P6 truss batteries 2B3 (channel 2B) and 4B3 (channel 4B) by ground commanding, started on 6/24, was successfully completed yesterday morning. The batteries were re-connected and are supporting nominally. Data analysis is currently in work with the results on the battery capacity expected tomorrow.

EVA-20a Timeline Preview (preliminary): The Orlan EVA-20a by Volkov/EV1 & Kononenko/EV2 on 7/10 is scheduled to begin at ~2:18pm EDT (DC1 EV hatch open), to last an estimated 5 hrs 43 min, i.e., concluding at approximately 8:00pm. The EVA is supported by the DC1-based Strela 1 crane, operated via hand crank by EV1. Main objective is the inspection of the Soyuz TMA-12 spacecraft at its first separation plane (Plane I) followed by removal of one Soyuz pyrobolt for retrieval to the DC1 and return to Earth. Before the removal of the separation bolt, protective covers will be temporarily installed on the spacecraft's attitude control thrusters (later removed), the pyrobolt's electrical connector will be demated, and the wiretie between the pyrobolts will be cut. If enough time remains after the Soyuz activity, the spacewalkers will also install a docking target (for the new MEM module) on the SM PkhO (Transfer Compartment) exterior.

[Background: Before their separation, Descent Module (SA) & Instrumentation Compartment (AO) are connected by five locks, each "zamok" containing two pyrobolts (explosive bolts) with individual electrical connection, of which only one needs to fire to release the lock. The locks are equally spaced around the 360-degree circumference of the separation plane, i.e., 72 deg apart. After the five locks have released, there are five spring-loaded pushers, also equally spaced, for separating the two modules by spring force. Each lock and pusher is located at the apex of two triangularly arranged aluminum pipes, i.e., altogether 20 inclined pipes, which make up the open truss structure between the modules.]

CEO (Crew Earth Observations) photo targets uplinked for today were **Mt. Etna, Sicily** *(nadir pass over Etna smoking. Crew was to shoot detail of black lava flows near summit),* and **Afar Rift Zone, Ethiopia** *(looking left towards the Red Sea Coast to document modern lava flows from several volcanoes. The alignment of fault lines also interests geologists. Lavas and fault lines relate to active opening of the Red sea and the Gulf of Aden).*

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:34am EDT [= epoch]):*
Mean altitude -- 345.3 km
Apogee height -- 350.8 km
Perigee height -- 339.7 km
Period -- 91.44 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0008292
Solar Beta Angle -- -19.8 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 60 m
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4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/25/08
Date:	Wednesday, June 25, 2008 2:16:55 PM
Attachments:	

ISS On-Orbit Status 06/25/08

All ISS systems continue to function nominally, except those noted previously or below.

Crew sleep cycle shift: After wake-up at the regular 2:00am EDT this morning, the crew will begin their sleeptime at 2:30pm, i.e., three hours earlier than usual, followed by a late-night wakeup at 11:00pm, to adjust the planned Orlan-suited dry-run & Soyuz ingress training for live VHF telemetry/comm visibility over RGS (Russian Groundsites). Tomorrow's sleep period begins at 3:30pm and extends to the regular 2:00am on 6/27 (Friday). The crew will then have half the day off to recover from the sleep shift.

Upon wake-up, FE-1 Kononenko terminated his fifth MBI-12 SONOKARD experiment session, started last night, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

After resetting STTS communication/telemetry links for their stay in the DC1 Docking Compartment, Volkov & Kononenko continued preparations for the subsequent suited Soyuz emergency ingress and the training for the Orlan EVA-20a:

- Kononenko, with FE-2 Chamitoff assisting, installed the US EMU (Extravehicular Mobility Unit) lights and TV camera on the helmet of Orlan-M #26, based on uplinked detailed procedures, while

- Volkov set up the DC1 and the Soyuz Orbital Module (BO) for the simulation run, creating room for moving about in the Orlans by removing air ducts (VD1, VD2) in DC1 and the BVN fan/heater assembly with air duct in the BO.

Afterwards, the CDR & FE-1 had three hours blocked out for rehearsing emergency escape from the DC1 into the Soyuz spacecraft while clad in the bulky spacesuits. *[Should the DC1 exhibit a pressure anomaly during the Orlan EVA activities, the BO of the Soyuz would be used (off-nominally) as an airlock. This would require: equalizing the pressure between DC1 and BO, ingressing the BO, closing the BO-DC1 (SU) hatch, doffing the Orlan-Ms, equalizing the pressure between the BO and the SA, and ingressing the SA (which already contains the FE-2). Either restoring DC1 hermeticity or Soyuz relocation to the FGB nadir port or return to Earth could then be performed safely.]*

After conclusion of the exercise, Sergey restored the nominal STTS comm settings and reconfigured the DC1 & Soyuz SOTR (Thermal Control System) with its air ducts etc. back to nominal.

Meanwhile, Gregory Chamitoff had an hour set aside for unpacking cargo delivered on STS-124/1J and stowing it at its final locations.

For covering tomorrow's Orlan donning & checkout for real-time photo/video downlink via US Ku-band assets, Greg worked on setting up the SONY PD100 camcorder with the necessary connections, including long drag-thru cables from the DC1.

The FE-2 also prepared the third Icepac insertion into the MELFI (Minus Eighty Degree Laboratory Freezer for the ISS) in the Lab for upcoming sample stowage by retrieving one -32deg Icepac belt from stowage and inserting it in Section 1 of Tray B in Dewar 3. *[Second insertion: 6/19.]*

Chamitoff then completed a run with the MedOps experiment WinSCAT (Windows Spaceflight Cognitive Assessment Tool), his first onboard session, by logging in on the MEC (Medical Equipment Computer) and performing the psychological evaluation exercise on the laptop-based WinSCAT experiment. *[WinSCAT is a monthly time-constrained questionnaire test of cognitive abilities, routinely performed by astronauts aboard the ISS every 30 days before or after the PHS (periodic health status) test or on special CDR's, crewmembers or flight surgeons request.]*

The FE-1 conducted the periodic checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the passageways SM PrK (Service Module

Transfer Compartment)–ATV, PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1.

Working off the Russian discretionary “time permitting” task list, Oleg completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables

Kononenko also performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

At ~9:45am EDT, Greg Chamitoff, with Volkov & Kononenko floating beside him, downlinked two televised PAO messages of greetings, to be taped on the ground for use at NASA Visitors Centers around the US and for promotional clips for NASA TV and the NASA website.

At ~11:40am, the FE-2 powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, and power supply) and at 11:45am conducted a ham radio exchange with students at Robinson Elementary School, Robinson, TX. *[Robinson Elementary is a second and third grade public school in Robinson, a suburb of Waco, TX. The campus has approximately 250 students and 32 teachers and staff. Students are from, mostly, low to middle income families with a rural background. The school has been recognized by the state of Texas for their performance in the state-based TAKS test. Questions to Greg were uplinked beforehand: “What countries are represented by the space station right now?”; “Do you float or walk in the space station?”; “Have you walked in space?”; “How do you go to the bathroom?”; “What do you do for fun in the space station?”; “Can you email or surf the web on the space station?”; “Do you watch your TV shows or any TV shows on the space station?”; “Does the space station orbit at the same speed as the earth?”; “How do you take a shower or a bath?”]*

The crew worked out according to their regular 2.5-hr. physical exercise protocol (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS (CDR, FE-2), RED (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1). Afterwards, Gregory transferred the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Periodic Noise Level Survey Abort: Due to a software/display issue with the new SLM (Sound Level Meter), yesterday’s scheduled acoustic station survey by

Chamitoff was aborted for lack of troubleshooting time. Currently being assessed and to be re-scheduled at a later time.

Columbus Troubleshooting: Ground teams are investigating what appears to be insufficient humidity collection (condensing) by the COL CWSA (Columbus Orbital Laboratory/Condensate Water Separator Assembly), possibly caused by a bad delta-pressure sensor, system blockage upstream of the sensor, or simply by the alteration of the station configuration by the addition of the Kibo JEM (Japanese Experiment Module). COL has also lost one of eight lighting fixtures, and a replacement with a spare LHA (Lamp Housing Assembly) is being considered.

VolSci Program: After receiving kudos from the PI for his excellent LOCAD Voluntary Science session last weekend, Greg Chamitoff was offered three choices each for the two weekends ahead (6/28-6/29, 7/5-6): (1) a SHERE (Shear History Extensional Rheology Experiment) session, to locate and assemble the SHERE hardware in the MSG WV (Microgravity Science Glovebox Work Volume) and assess the condition of the hardware (SHERE will study the effect of rotational preshear on a polymer fluid being stretched axially in a microgravity environment; this knowledge can be applied to designing and processing materials for future exploration missions); (2) an "operations improvement" session with SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellites) with all three satellites (single-satellite experiments to test new thrusting algorithms and demonstrate safe trajectories for the inspection of space structures; two-satellite experiments to introduce new controllers and on-line path planning tools for purpose of docking to a complex tumbling satellite; three-satellite runs for formation flight experiments to test initialization of a formation and obstacle avoidance; (3) an EPO (Education Payload Operations) Demo on Space Careers, creating an educational video discussing different careers found at NASA, to be used to produce an educational product to enhance existing education resources for students in grades 9-12. For 7/5-6: (1) SHERE (see above); (2) SPHERES (see above); (3) a LOCAD PTS (Lab-On-A-Chip Application Development – Portable Test System) surface sampling session using Glucan LAL cartridges, targeting yeast & molds on ISS surfaces.

EVA-20a Timeline Preview (preliminary): The Orlan EVA-20a by Volkov/EV1 & Kononenko/EV2 on 7/10 is scheduled to begin at ~2:18pm EDT (DC1 EV hatch open), to last an estimated 5 hrs 43 min, thus concluding at approximately 8:00pm. The EVA is supported by the DC1-based Strela 1 crane, operated via hand crank by EV1. Main objective is the inspection of the Soyuz TMA-12 spacecraft at its first separation plane (Plane I) followed by removal of one Soyuz pyrobolt for retrieval to the DC1. Before the removal of the separation bolt, protective covers will be temporarily installed on the spacecraft's attitude control thrusters (later removed), the pyrobolt's electrical connector will be demated, and the wiretie between the

pyrobolts will be cut. If enough time remains after the Soyuz activity, the spacewalkers will also install a new docking target (for the new MEM module) on the SM PkhO (Transfer Compartment) exterior.

CEO (Crew Earth Observations) photo target uplinked for today was Ganges River Delta *(the Ganges Delta is the world's largest delta. It empties into the Bay of Bengal and is one of the most fertile regions in the world. The Ganges Delta is one of CEO's long term monitoring sites. Context views of the delta were requested. There's particular interest in the land use boundaries. As with most deltas, there will probably have been clouds covering parts of the delta)*.

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1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/24/08
Date:	Tuesday, June 24, 2008 12:47:14 PM
Attachments:	

ISS On-Orbit Status 06/24/08

All ISS systems continue to function nominally, except those noted previously or below.

Before breakfast and exercise, all crewmembers completed a 10-min session with the periodic Russian MedOps test "Hematokrit" (MO-10), which measures the red cell count of the blood, with CDR Volkov acting as CMO (Crew Medical Officer, Russian: Examiner). It was the second session for Volkov & Kononenko, the first for Chamitoff. *[The blood samples were drawn from a finger with a perforator lancet, then centrifuged in two microcapillary tubes in the M-1100 kit's minicentrifuge, and its hematocrit value was read off the tubes with a magnifying glass. It is a well-known phenomenon of space flight that red blood cell count (normal range: 30-45%) tends to go down over time. After the exam, the data were saved in the IFEP software (In-Flight Examination Program) on the MEC (Medical Equipment Computer), and Kononenko stowed the equipment.]*

FE-2 Chamitoff started out on the NASA SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment by initializing and donning an Actiwatch, using the HRF-1 (Human Research Facility 1) laptop. *[As other crewmembers before him, to monitor his sleep/wake patterns and light exposure, Gregory will be wearing the special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout this week, for the last time. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

The CDR serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out"-to-vacuum cycle on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~5:15pm EDT. Filter bed #1 regeneration was performed yesterday. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is*

currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time done: 6/19&20).]

Before starting today's suited Soyuz ingress training, Sergey, Oleg and Greg conducted the standard 30-min. fit check of the Kazbek couches, the contoured shock absorbing seats in the Descent Module (SA) of the Soyuz TMA-12/16S spacecraft docked at the DC1 Docking Compartment. *[For the fit check, crew members removed their cabin suits and donned Sokol KV-2 suit and comm caps, got into in their seats and assessed the degree of comfort & uniform body support provided by the seat liner. Using a ruler, they then measured the gap between the top of the head and the top edge of the structure facing the head crown. The results were reported to TsUP. Kazbek-UM couches are designed to withstand g-loads during launch and orbital insertion as well as during reentry and brake-rocket-assisted landing. Each seat has two positions: cocked (armed) and noncocked. In cocked position, they are raised to allow the shock absorbers to function during touchdown. The fit check assures that the crewmembers, whose bodies gain in length during longer-term stay in zero-G, will still be adequately protected by the seat liners for their touchdown in Kazakhstan, either emergency or regular return.]*

After resetting DC1 communication/telemetry links for their presence, Oleg continued clearing and configuring the "Pirs" module for the spacewalk training, including deactivating the spherical Phantom device and the Lulin-5 electronics box of the "Matryoshka-R" (RBO-3-3) radiation payload suite plus ancillary hardware and moving all of it to the FGB for temporary stowage.

Continuing preparations for the Orlan EVA-20a on 7/10-11, Volkov first tested the proper function of the pressure equalization valve (PEV; Russian: KVD) in the DC1 (SU)-to-Soyuz transfer hatch. Volkov & Kononenko then had ~2 hrs set aside for rehearsing and training a possible emergency situation which calls for their translation from the DC1 to the Soyuz Orbital Module (BO) in flight suits, with a pressurized Orlan-M spacesuit and in two spacesuits. *[Should the DC1 exhibit a pressure anomaly during the Orlan EVA activities, the BO of the Soyuz would be used (off-nominally) as an airlock. This would require equalizing the pressure between DC1 and BO, ingressing the BO, closing the BO-DC1 (SU) hatch, doffing the Orlan-Ms, equalizing the pressure between the BO and the SA, and ingressing the SA (which already contains the FE-2). Either restoring DC1 hermeticity or Soyuz relocation to the FGB nadir port or return to Earth could then be performed safely.]*

Afterwards, Kononenko restored the nominal communications setup in DC1 and Service Module (SM).

Later, the CDR & FE-1 installed US add-on hardware on their Orlan suits and took

photographs for ground inspection. *[US add-ons include helmet lights, WVS (Wireless Video System) helmet cam & associated tools, DIDBs (Disposable In-suit Drink Bags), Fresnel lenses, Orlan tether adapters, adjustable fuse tether, DCS760 camera, needle-nose pliers, etc. from previous ECOKs (EMU Crew Options Kits).]*

In the DC1 "Pirs", Kononenko then removed the threaded QD (quick disconnect) screw clamps (BZV) of the SSVP docking & internal transfer system to enable contingency Soyuz undocking, should it become necessary.

Sergey Volkov also worked on the SM toilet systems (ASU), performing the monthly 30-min. maintenance/servicing of the facility, changing out replaceable ASU parts with new components, i.e., the urine receptacle (MP) and a filter insert (F-V). The old parts were discarded as trash.

Greg completed the periodic relocation of the IVCPDS/TEPC (Intravehicular Charged Particle Directional Spectrometer/Tissue Equivalent Proportional Counter), the primary radiation measurement tool in the ISS, from Lab at position LAB1S4 to SM panel 449, plugging its power cable in the CHeCS (Crew Health Care Systems) power/data outlet 6 on panel 450. *[Before its move to LAB1S4 on 5/21, TEPC was installed first on the Columbus L1A3 panel by Peggy Whitson, after Dan Tani had relocated it to the SM (panel 410) on 1/23/08 from its previous location in Node-2 (since 12/24/07).]*

The FE-2 also performed the periodic offloading of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1062) with the collected water slated for processing. No samples were required. *[Transferred quantity is determined by allowing tank and CWC equalize with each other. Tank quantity stabilizes at a value higher than the neutral point. Waiting time ~30 min.]*

In the COL (Columbus Orbital Laboratory), Chamitoff did a quick inspection & cleaning job on the RGSH (Return Grid Sensor Housing) of the COL's ventilation system.

Gregory checked out the U.S. SLM (Sound Level Meter) instrument and then used it to conduct the periodic noise level measurements program in the station interior for a 2-hr acoustic survey, including transfer of the recorded data to the MEC (Medical Equipment Computer). *[A total of 45 acoustic measurements were obtained at four locations in the ATV-1, six locations in Node-2, 11 locations in the SM, eight locations in the COL, nine locations in the Kibo JPM, and four locations in the Kibo JLP. The survey also includes three crew preference locations taken at their perceived loudest locations in the station. The SLM gives instantaneous noise levels and their frequency spectra, which are transferred to the MEC laptop via an*

RS232 cable and later downlinked with regular CHeCS (Crew Health Care Systems) data dump or via OCA.]

Later, Chamitoff performed the monthly maintenance of the CEVIS (Cycle Ergometer with Vibration Isolation & Stabilization), focusing on isolator damage and documenting it with the videocam for ground evaluation.

The FE-2 also completed the periodic (monthly) inspection of the RED (Resistive Exercise Device) canister cords and accessories.

Oleg performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Later, Kononenko conducted the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

The crew worked out according to their regular 2.5-hr. physical exercise protocol (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS (FE-1, FE-2), TVIS treadmill (CDR, FE-1), RED (FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR). Afterwards, Sergey transferred the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Gregory had about an hour for himself for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residence, if she/he chooses to take it.

At ~9:45am EDT, the two Russian crewmembers downlinked a PAO TV message of greetings and congratulations for the 30th Anniversary of the spaceflight of the first Polish cosmonaut, Miroslav Hermaszewski (Russian: Germashevsky), who flew with Col. Pyotr Klimuk on June 27, 1978 on Soyuz-30 into orbit, spending 7 days 22 minutes 59 seconds in space. *[Hermaszewski's flight was part of the East Bloc's "Intercosmos" space program. After his flight, Hermaszewski continued to serve in the Polish armed forces. A Hero of the Soviet Union, he has been awarded the Soviet Order of Lenin, the Polish Order of the Grunwald Cross (1st degree), and other Polish decorations and medals. He was also conferred the Nicolaus Copernicus medal of the Polish Academy of Sciences. Today, Hermaszewski is retired and engaged, as a volunteer, in promoting space exploration.*
Hermaszewski sent a special message up to the ISS crew: "Hi there my friends!

Cordial greetings from Miroslaw. I am happy that you are up there – realizing your dreams! Enriching wonderful tradition of World space technology! I regret that I cannot be now up there with the crew. I wish you a soft landing and see you on the ground! If I could have one request – would you mind making one photo of Poland? Cordial greetings from all of us here! Miroslaw Hermaszewski."]

The three crewmembers had their regular periodic PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Sergey at ~11:05am, Oleg at ~11:55am, Garrett at ~1:40pm.

At ~4:11pm, the crew will convene for their standard bi-weekly teleconference with the JSC Astronaut Office (Steve Lindsey), via S-band S/G-2 audio & phone patch.

At ~5:20pm, just before sleep time, Oleg will again set up the Russian MBI-12 SONOKARD (Sonocard) payload and start his fifth experiment session, using a sports shirt from the SONOKARD kit with a special device in the pocket for testing a new method for acquiring physiological data without using direct contact on the skin. Measurements are recorded on a data card for return to Earth. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

Still remaining on the voluntary task list item for Kononenko & Volkov today was an audit of expired Expedition 16 food rations, with repacking & preparation of food packages for disposal on the ATV1. *[To clear storage space for cargo items delivered on Progress M-64/29P.]*

Sleep Cycle Shift Preview: For adjusting the Orlan-suited dry-run & Soyuz ingress training next Thursday (6/26) to allow live VHF telemetry/comm visibility over RGS (Russian Groundsites), the crew will have an earlier (by 3 hrs) sleeptime tomorrow at 2:30pm EDT, followed by same-day wake-up at 11:00pm. On 6/26, sleep period begins at 3:30pm and extends to the regular 2:00am on 6/27 (Friday). The crew will then have half the day off to recover from the sleep shift.

BCC Dry Run: Early this morning, starting at 2:15am EDT and running for seven hours, MCC-Houston and its Moscow support group (HSG) conducted another BCC (Backup Control Center) dry run in test mode, with no involvement of the ISS crew or vehicle, with TsUP playing back ACT (American Contingency Telemetry) from the last BCC Checkout as test. *[Purpose of this periodic exercise is to*

demonstrate BCC functionality under Russian assets while providing proficiency training for HSG personnel at the HSR (Houston Support Room) and TsUP-Moscow specialists. The ISS EMCC (Emergency Mission Control Center), located in Russia, comprises TsUP/Moscow as the Lead Control Center, coupled with HSR at TsUP. The BCC facility provides a command and control capability from TsUP if the EMCC must be activated. This is the case in situations that render MCC-Houston unable to provide telemetry, voice, and command capability for extended periods. EMCC is also used when the threat of severe weather results in evacuation of the MCC-H building for extended periods. In such an emergency, both Russian servers (CMD/command & TM/telemetry) are transitioned from MCC-H connectivity to BCC configuration, after which only the BCC can connect to the CMD and TM ports. An actual contingency requiring switchover to the BCC occurred on 10/2/2002 when Hurricane Lili forced MCC-H to shut down at 4:00am EDT, and also last year during the Hurricane Katrina emergency.]

PPS P6 Capacity Test: At ~10:00am, a capacity test was started by ground commanding on the truss P6 battery sets 2B3 (channel 2B) and 4B3 (channel 4B), simultaneously. The PPS (Primary Power System) test involves discharging the batteries to their lower limits and then recharging them, in order to measure the effectiveness of recent (May '08) battery recondition activities. No systems powerdowns are required.

CEO (Crew Earth Observations) photo targets uplinked for today were **Tigris-Euphrates Delta** *(this area has undergone dramatic changes in the last few decades. The marshlands of the historic Tigris-Euphrates delta in southern Iraq have almost completely disappeared owing to excessive damming and drainage, according to a report from the UN Environmental Program. Overlapping, detailed, nadir views of the delta region were requested),* **Mt. Etna** *(Mt. Etna is a very active volcano located on the east coast of Sicily. It is the largest active volcano in Europe and some eruptions have been caught by past ISS crews. Nadir or near-nadir views were requested with overlapping frames. Documenting past lava flows [darker areas] and smaller cones and vents surrounding the volcano),* and **Afar Rift Zone, Ethiopia** *(the Afar region is one of our long term monitoring sites. We are particularly interested in documenting the faults, volcanoes, and past lava flows in this region. Overlapping frames were requested)*.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:37am EDT [= epoch]):*
Mean altitude -- 345.4 km
Apogee height -- 351.0 km

Perigee height -- 339.8 km
Period -- 91.44 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0008338
Solar Beta Angle -- -24.5 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 62 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54968

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
06/26/08 -- Orlan-suited dry-run & Soyuz ingress training
07/10/08 -- Russian EVA-20a (7/10-11)
09/05/08 -- ATV1 Undocking
09/09/08 -- Progress M-64/29P undocking (from FGB nadir)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/03/08 -- Soyuz TMA-13/17S relocation
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
02/10/09 -- Progress M-67/32P launch
02/12/09 -- Progress M-67/32P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/23/09 -- STS-119/Discovery/15A undocking
03/25/09 -- Soyuz TMA-14/18S launch
05/21/09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/30/09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 19S docking, May ’09)**
4QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/23/08
Date:	Monday, June 23, 2008 2:01:13 PM
Attachments:	

ISS On-Orbit Status 06/23/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 10 of Increment 17.*

CDR Volkov, FE-1 Kononenko and FE-2 Chamitoff began their workday before breakfast with the periodic session of the Russian biomedical routine assessments PZEh-MO-7/Calf Volume Measurement & PZEh-MO-8/Body Mass Measurement (fourth for CDR & FE-1, second for FE-2), using the IM mass measurement device which Sergey Volkov broke down afterwards for stowage. *[Calf measurements (left leg only) are taken with the IZOG device, a custom-sewn fabric cuff that fits over the calf, using the knee and lower foot as fixed reference pints, to provide a rough index of deconditioning in zero-G and effectiveness of countermeasures. For determining body mass in zero-G, where things are weightless but not massless, the Russian IM "scales" measure the inertial forces that arise during the oscillatory motion of a mass driven by two helical metering springs with known spring constants. By measuring the time period of each oscillation of the unknown mass (the crewmember) and comparing it to the period of a known mass, the crewmember's mass is calculated by the computer and displayed.]*

The FE-1 performed the periodic service of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The regen process will be terminated before sleeptime, at ~5:30pm EDT. Bed #2 regeneration follows tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle, normally done every 20 days, is currently performed four times more frequently to remove any lingering Freon-218 from the cabin atmosphere (last time: 6/19&20).]*

Pressing on with preparations for the Orlan EVA-20a on 7/10-11, Volkov & Kononenko, plus Chamitoff for some part, spent more time in the DC1 Docking

Compartment where they –

- Reviewed procedures for the Orlan-suited translation from the DC1 to the Soyuz BO/Orbital Module (when the FE-2 will be behind the closed SA/ Descent Module hatch), supported by ground specialist tagup,
- Searched for & gathered EVA tools & equipment, and
- Configured the BO & DC1 for the spacewalk *[mostly by transferring a large number of stowage items from the Soyuz & FGB to temporary locations in the DC1, SM (Service Module), COL (Columbus Orbital Laboratory), and also to Progress 29P and/or ATV1 for disposal, while keeping track of the moves in the IMS (Inventory Management System).]*

Gregory Chamitoff continued his JEM (Japanese Experiment Module) outfitting activities, today

- Connecting and activating the Kibo SLT (Station Laptop Terminal) on the JMP (JEM Pressurized Module) laptop table, after removing the SSC-14 (Station Support Computer 14) from it (but keeping it connected to its UOP/ Utility Outlet Panel),
- Reconfiguring the JMP laptop (local Bus 2) and IAA (Intravehicular Antenna Assembly) by connecting their jumper cables to the JLP (JEM Logistics Pressurized Section), and later
- Moving the SLT to a different location (and UOP) in the Kibo laboratory.

Volkov & Kononenko worked on the RS (Russian Segment) radiation payload suite "Matryoshka-R" (RBO-3-3)/SDTO (Station Development Test Objective) 50448. *[While Oleg opened the detector kit for checking out all Bubble Dosimeters for bubbles and photographing them for subsequent downlink of images, Sergey conducted the periodic time synchronization between the RSS1 laptop and BSPN payload server, after testing functionality by checking data comm between the two computers and synching RSS1 to station time with the RSC-E PingMaster application. The CDR then loaded new payload data in form of a parameter table into the RBO-3-3 hardware via the ShellForKE payload file transfer program.]*

In preparation for an upcoming major IFM (Inflight Maintenance) task on the ITCS (Internal Thermal Control System), FE-2 Chamitoff had half an hour set aside to review and study background & procedures for the FSS (Fluid System Servicer) activities, scheduled later this week, on 7/26 & 7/27. *[The IFM will refill the LTL PPA (Low Temperature Loop Pump Package Assembly) accumulator, necessary due to the recent installation of the Lab AmiA (Antimicrobial Applicator) by Karen Nyberg during 1J and the leak at the LTL supply QD (Quick Disconnect). With the FSS set up on Day 1, Greg will also refill the MTL (Moderate Temperature Loop) PPA accumulator and the spare ITCS CSA (Coolant Sampling Adapter). Because both of the JEM ITCS CSAs were deleted from the 1J manifest, the plan is to eventually install the spare onboard CSA in the JPM to take samples until the JEM*

Adapters are delivered on a later mission. On Day 1 (7/26), Chamitoff will set up the FSS including filling its jumpers and the spare CSA. On Day 2 (7/27), the LTL & MTL PPA accumulators will be refilled, the FSS & FSS jumpers drained and purged to vacuum FSS jumpers, and everything stowed.]

Gregory had another hour reserved for working in the "Quest" Airlock, gathering and preparing the US hardware selected for use with the Russian spacesuits during the Orlan EVA-20a. *[Equipment to be installed on the Orlans includes helmet lights, WVS (Wireless Video System) helmet cam & associated tools, DIDBs (Disposable In-suit Drink Bags), Fresnel lenses, Orlan tether adapters, adjustable fuse tether, DCS760 camera, needle-nose pliers, etc. from previous ECOKs (EMU Crew Options Kits).]*

The FE-2 also completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Working off the Russian discretionary "time permitting" task list, the CDR performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Sergey Volkov unstowed and installed the equipment for the periodic Russian PZE-MO-10 "Hematokrit" testing which is scheduled for him and Oleg tomorrow. *[MO-10 measures the hematocrit (red blood cell mass) value of the blood (it is a well-known phenomenon of space flight that red blood cell mass {normal range: 30-45%} tends to go down over time).]*

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

Afterwards, Sergey transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Still remaining on the voluntary task list item for Kononenko & Volkov today was an audit of expired Expedition 16 food rations, with repacking & preparation of food packages for disposal on the ATV1. *[To clear storage space for cargo items delivered on Progress M-64/29P.]*

Sleep Cycle Shift Preview: For adjusting the Orlan-suited dry-run & Soyuz ingress training next Thursday (6/26) to allow live VHF telemetry/comm visibility over RGS (Russian Groundsites), the crew will have an earlier (by 3 hrs) sleeptime on Wednesday (6/25) at 2:30pm EDT, followed by same-day wake-up at 11:00pm. On 6/26, sleep period begins at 3:30pm and extends to the regular 2:00am on 6/27 (Friday). The crew will then have half the day off to recover from the sleep shift.

No CEO (Crew Earth Observation) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:10am EDT [= epoch]):*
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Perigee height -- 339.9 km
Period -- 91.45 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0008318
Solar Beta Angle -- -26.2 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 36 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54952

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
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09/10/08 -- Progress M-65/30P launch
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10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
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11/20/08 -- **ISS 10 Years**
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11/28/08 -- Progress M-66/31P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/23/09 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/22/08
Date:	Sunday, June 22, 2008 1:23:18 PM
Attachments:	

ISS On-Orbit Status 06/22/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday -- off-duty for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff. Ahead: Week 10 of Increment 17.*

Sergey Volkov conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The CDR also gathered weekly data on Total Operating Time & “On” durations of the Russian POTOK-150MK (150 micron) air filter unit of the SM’s SOGS air revitalization subsystem for reporting to TsUP.

For some power switching by the PRO (Payload Rack Officer) at POIC (Payload Operations & Integration Center) on the ER4 (EXPRESS Rack 4) via ground commanding, FE-2 Chamitoff stopped sampling mode on the ANITA (Analyzing Interferometer for Ambient Air) payload, exited the software and powered down the laptop. Later, the procedures were reversed and ANITA powered up again with re-launched software. *[ANITA will be returned on STS-126/ULF-2.]*

Gregory also deinstalled the UOP DCP (Utility Outlet Panel/Display & Control Panel) bypass power cable to the VTR (Video Tape Recorder) at the Lab RWS (Robotics Work Station), now no longer required for a while.

At ~4:45am EDT, Kononenko powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, and power supply) and at 4:50am conducted a ham radio exchange with representatives of the

Kursk State Technical University who are participating in the Slavic Commonwealth Forum at the Dagomys (a giant resort complex/hotel near the Black Sea town of Sochi). *[Oleg was asked to take a few photos showing how he operated the ham radio and the equipment itself with cables going to the RSK-2 laptop, for downlink to TsUP-Moscow.]*

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

At ~1:15pm, Greg Chamitoff had his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

Working off his suggested “time permitting” task list, CDR Volkov continued the session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program begun yesterday, using the NIKON D2X still camera and the Japanese HDV (High Definition) video camera provided by SFP Charles Simonyi. *[Uploaded targets were wooded areas in the Orenburg steppe, the Yasnyi Cosmodrome in nadir, the Irtysh river valley, video of the northern part of Taiwan, the confluence of the Desna and Seym rivers, Ugra National Park, the steppe 100 km south of Voronezh, one of the Chernozem river valleys, Yuri Gagarin’s landing site, the Aral Sea, glaciers on the northern slopes of Kirghiz range to the west from lake Issyk-Kul, Tibet and Himalaya, remediation of the Soviet Army weaponry range to the south of Berlin, vestiges of flooding in Stavropol, floods in Volga-Aktyubinsk alluvial plain (photos downlinked in real time via BSRTM channel), and oil deposits in Kazakhstan.]*

Also working from the discretionary task list, the CDR conducted another run, his sixth, of the Russian DZZ-2 "Diatomeya" ocean observations program, using the NIKON-F5 DCS still camera and the HDV (high-definition) video camcorder from SM window 8 for ~20 min to record high production water areas for obtaining data on color field composition in dynamic regions of the ocean and in near-estuary areas of large rivers, plus the current cloud cover above these waters, its rating, and special forms of cloud formation. *[Target zones today in the North Atlantic were waters off Newfoundland Island, the Bay of Biscay and West Saharan offshore areas.]*

For the FE-1, a discretionary task list job was another session for Russia's Environmental Safety Agency (EKON), making observations and taking KPT-3 aerial photography of environmental conditions of the Baikonur Cosmodrome using the Nikon D2X with the SIGMA 300-800mm telephoto lens.

Still remaining on the voluntary task list item for Kononenko & Volkov today was an audit of expired Expedition 16 food rations, with repacking & preparation of food packages for disposal on the ATV. *[To clear storage space for cargo items delivered on Progress M-64/29P.]*

No CEO (Crew Earth Observation) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:46am EDT [= epoch]):*
Mean altitude -- 345.5 km
Apogee height -- 351.2 km
Perigee height -- 339.8 km
Period -- 91.45 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0008476
Solar Beta Angle -- -27.3 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 46 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54936

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 Undocking
09/09/08 -- Progress M-64/29P undocking (from FGB nadir)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/03/08 -- Soyuz TMA-13/17S relocation
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking

02/23/09 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/21/08
Date:	Saturday, June 21, 2008 12:49:20 PM
Attachments:	

ISS On-Orbit Status 06/21/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – lightened-duty day for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff. Today is Kononenko's 44th birthday.* ***Happy Birthday, Oleg Dmitriyevich!***

Volkov & Kononenko completed a review of flight procedures plus the standard 3-hr. training drill for a Soyuz TMA-12/16S relocation from the DC1 Docking Module to the FGB nadir port, supported by ground specialists via tagup on S-band/VHF-audio. *[Should "Pirs" fail to repressurize after ingress of the two spacewalkers on 7/11, a relocation of the Soyuz, docked to the DC1 nadir port with FE-2 Chamitoff already safely locked out in the 16S Descent Module, would become necessary. In addition, for the relocation the three crewmembers and the spacecraft will have to be prepared for a return to Earth in the event of a no-docking contingency, and the station has to be configured for uncrewed operation (for which intense planning is underway at NASA, ESA, and TsUP-Moscow). Today's 3-hr. OBT (on-board training) included Soyuz procedures and data analysis for ascent/descent, orbital flight and relocation as contained in RODF (Russian Operations Data File) books, tag-up with instructor, OBT simulator work on the RSK1 laptop, etc. It is assumed that Soyuz activation would be performed on 7/11 over RGS (Russian Groundsite) on DO13 (Daily Orbit 13), closure of hatch on DO15, undocking from DC1 on DO2 (~5:28pm EDT on 7/11), flyaround (~5:34pm) and redocking at FGB nadir at ~5:56pm (DO2).]*

Afterwards, the crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the Service Module (SM) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature*

rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]

The CDR conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Volkov also gathered weekly data on Total Operating Time & “On” durations of the Russian POTOK-150MK (150 micron) air filter unit of the SM’s SOGS air revitalization subsystem for reporting to TsUP.

Greg Chamitoff filled out the regular FFQ (Food Frequency Questionnaire), his second, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

At ~10:00am EDT, the crewmembers held their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

After setting up the Lulin-ISS radiation complex kit yesterday with its ICU (Interface Control Unit, Russian: BUI) for recharging the batteries of the four PILLE radiation dosimeters, Oleg today checked on the battery charges and reported to the ground, then disassembled and stowed the equipment.

Chamitoff performed the regular bi-monthly reboot of the OCA Router and File Server SSC (Station Support Computer) laptops.

For his Voluntary Weekend Science (VolSci) program today, Gregory conducted his first session with the LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System) payload, first conducting an OBT review and PI teleconference, then sampling/swabbing five surface sites for yeast & molds, using

Glucan LAL cartridges and a Negative Control sample of clean water. *[LOCAD uses small, thumb-sized "microfluidic" cartridges that are read by the experiment reader. The cartridges contain dried extract of horseshoe crab blood cells (LAL/ Limulus amebocyte lysate) and colorless dye. LAL tests are used for the detection and quantification of bacterial endotoxins: in the presence of the bacteria, the dried extract reacts strongly to turn the dye a green color. Therefore, the more green dye, the more microorganisms there are in the original sample. Glucans are complex carbohydrate (sugar, D-glucose) macromolecules. The handheld device tests this new analysis technology by sampling for the presence of gram negative bacteria in the sample in about 15 minutes, showing the results on a display screen.* *Background:* *Lab-on-a-Chip technology has an ever-expanding range of applications in the biotech industry. Chips are available (or in development) which can also detect yeast, mold, and gram positive bacteria, identify environmental contaminants, and perform quick health diagnostics in medical clinics. The technology has been used to swab the MERs (Mars Exploration Rovers) for planetary protection. With expanded testing on ISS, began by Sunita Williams in March/April last year, this compact technology has broad potential applications in space exploration--from monitoring environmental conditions to monitoring crew health. The current study should prepare for long-duration exploration by demonstrating a system that enables the crew to perform biochemical analysis in space without having to return samples to Earth.]*

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

Afterwards, Gregory transferred the crew's exercise data file to the MEC for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

The Russian crewmembers had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Oleg at ~6:30am (receiving birthday congrats from his wife and two children), Sergey at ~8:05am.

Working off his suggested "time permitting" task list, CDR Volkov performed another session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program using the NIKON D2X still camera and the Japanese HDV (High Definition) video camera provided by SFP Charles Simonyi. [*Uploaded targets were general views of the Pyrenees, the Alps-Sudetes-Tatras-Carpathians mountain chain , the Desna &*

Seym river confluence, steppes to the south of Voronezh, the valley of one of the Central Chernozem area rivers running from the north to the south to the Volga-Don delta, the Yasnyi launch site in nadir, remediation efforts of the former Soviet Army firing range in Germany, Ugra National Park, the hydrological situation on the Volga-Aktyubinsk alluvial plain, the coastal strip of the Aral Sea, tips of Pamir glaciers to the west, Fedchenko glacier, Karakorum glaciers, scenic photography of the Himalayas, detailed photography of the Himalayas tallest mountain peaks, the valley of one of the rivers in Moldova in nadir, the Kerch Strait, vestiges of flooding in the Stavropol Territory, the Mzymta river estuary near Adler, glaciers on the northern slope of the Caucasus Range in an area from the Elbrus to Kazbek, woodlands near northern shore of Sevan lake, glaciers near arc-shaped water reservoir dams on the south shore of Rhone river falling into the Lake of Geneva from the east, and general coastline views of the Balkans and Greece with her islands.]

For Kononenko, the Russian voluntary task list suggested another ECON KPT-3 session for today, making observations and taking aerial photography of environmental conditions for Russia's Environmental Safety Agency (ECON) using the Nikon D2X digital camera with SIGMA 300-800mm telephoto lens. *[Today's target zones: Lake Balkash and the Aral Sea.]*

Still remaining on the voluntary task list item for Kononenko & Volkov today was an audit of expired Expedition 16 food rations, with repacking & preparation of food packages for disposal on the ATV. *[To clear storage space for cargo items delivered on Progress M-64/29P.]*

HRM Troubleshooting: Troubleshooting attempts by the crew on a Heart Rate Monitor have not been successful as yet. Planning for more is underway.

COL Labeling Discrepancies: A total of eight fire ports in the COL (Columbus Orbital Laboratory) have been found to be labeled differently from the printed COL Emergency Procedures. This may put the crew at risk. Work is underway at COL-CC to determine best choice of correcting the discrepancies (either relabeling or reprinting the procedures).

SKV Restoration Outlook: For the restoration of the two Russian SKV air conditioners, both currently nonfunctional, plans are to attempt a recharge of SKV-2 with Khladon (Freon-218) in early July, timeline permitting. The retry could cause an additional leak but the crew will cap it as quickly as possible (if required, would also use Khladon from SKV-1). Check valves of both SKVs are post-EOL (end-of-life). New heat exchangers are being built in Russia for both SKVs, to be ready by the end of the year. US CCAA (Common Cabin Air Assembly) air conditioners are

currently active in the Lab (P6), in Node-2 and in the Airlock.

Weekly Science Update *(Expedition Seventeen -- Week 9)*

PADLES *(Passive Dosimeter for Lifescience Experiment in Space):* In progress.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Measurements continue in FGB module.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): In progress.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): In progress.

FSL (Fluid Science Laboratory): In progress.

GEOFLOW: In progress.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Complete.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 "Pirs".

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION w/REPOSITORY: "Greg, thank you for your efforts in completing the FD15 session. We appreciate the attention to detail in maintaining blood timeline constraints."

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Inc16 samples have been downloaded with 15S and handed over to science team.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): "Greg, next week you will have your first Sleep Actiwatch download/initialization session. Due to a recent hardware issue in the previous crew rotation, we have spaced out your Actiwatch download task and Actiwatch initialization task to allow time for a downlink and verification of the data in between. This will allow the Sleep Experiment Support Scientist to verify the data before you initialize the Actiwatch, which is an operation that starts to overwrite the previous period's data."

SOLAR (Solar Monitoring Observatory): In progress.

SOLO: Planned.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

3-D SPACE : In progress.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): In progress.

CEO (Crew Earth Observations): Through 6/16 the ground has received a total of 2,124 of ISS/CEO images for review and cataloging. No imagery was received since the last crew change and the resumption of CEO Target Lists on 6/17. "We look forward to working with you and helping you acquire good imagery of our science targets. Any feedback on our products and how we are doing in our support would be most welcome!"

CEO (Crew Earth Observations) photo targets uplinked for today were Madrean Sky Islands, New Mexico (this target is located in the northern reaches of Mexico's Sierra Madre Occidental which boast some of the richest biodiversity anywhere in North America. The "Sky Islands" are a veritable archipelago of cool, moist, higher-altitude pine-oak forested mountain ranges that dot the hot deserts of southern Arizona—New Mexico—northwestern Mexico. These climatological islands, situated in remote and rugged areas, are being heavily modified by logging. General images were requested for this relatively new site), East Haruj Megafans, Libya (ancient, now defunct rivers [sourced in the Tibesti Mountains to the south of the site when the Sahara Desert was much wetter] have laid down vast spreads of sediment as a series of large fans hundreds of km long and wide. As rivers shifted position they produced networks of criss-crossing stream channels covering the entire surface of megafans. Earth's megafans may be the best analog for widespread "intercrater plains" on Mars. This analog is being applied for the first time in ongoing research), .and Mississippi River flooding (Dynamic event. **ISS passed directly over sectors of the Mississippi River where levee breaks have occurred**. Cloud cover may break sufficiently to allow views of the river. Looking

left and then right of track for about 1.5 mins).

CEO photography can be studied at this “Gateway” website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:52am EDT [= epoch]):*
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Eccentricity -- 0.0008326
Solar Beta Angle -- -28.0 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 71 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54921

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 Undocking
09/09/08 -- Progress M-64/29P undocking (from FGB nadir)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/03/08 -- Soyuz TMA-13/17S relocation
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/23/09 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2

4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/20/08
Date:	Friday, June 20, 2008 12:57:59 PM
Attachments:	

ISS On-Orbit Status 06/20/08

All ISS systems continue to function nominally, except those noted previously or below.

Crew wake-up was half an hour earlier (1:30am EDT) for the Orlan training exercise, enabling suit telemetry over RGS (Russian Groundsites). Sleep time tonight will be back at regular time (5:30pm).

In the DC1 “Pirs”, the CDR & FE-1 continued preparations for the EVA-20 on 7/10-11, with the DC1 comm links configured for their presence. Activities by Volkov & Kononenko today focused on

- Functional testing of the Russian BETA-08 ECG (electrocardiogram) lead cable belts, worn under the Orlan-M suits, using the Gamma-1M medical complex from the PKO medical exam panel,
- Transmission tests, after setting up the Orlan “Tranzit” communications links via the suits’ BRTA radio telemetry units, with the ground via RGS VHF, for spacesuit voice, telemetry & biomedical parameters; followed by
- Restoring nominal communications setup in the DC1, and
- Configuring the backup Orlan #25 for stowage mode, leaving Orlans #26 (FE-1) & #27 (CDR) ready for use on the upcoming spacewalk.

In the U.S. “Quest” Airlock, FE-2 Chamitoff continued post-1J EVA activities, terminating the 13-hr discharge process on the last 16-volt EMU (Extravehicular Mobility Unit) battery in the BCM-3 (Battery Charger Module 3) from yesterday. *[BCM-4 is currently nonfunctional. The discharge process, originally handled manually by a crewmember, is an automated procedure controlled from an A31p SSC (Station Support Computer) laptop with a special DOS application.]*

The CDR serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out"-to-vacuum cycle on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~5:15pm

EDT. Filter bed #1 was regenerated yesterday. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle is regularly done every 20 days.]*

After breaking out the auditory test equipment, Gregory Chamitoff took the periodic O-OHA (on-orbit hearing assessment) test, a 30-min. NASA environmental health systems examination to assess the efficacy of acoustic countermeasures, using a special MEC (Medical Equipment Computer) laptop application. It was his first O-OHA session. *[The O-OHA audiography test involves minimum audibility measurements for each ear over a wide range of frequencies (0.25-10 kHz) and sound pressure levels, with the crewmembers using individual-specific Prophonics earphones, Bose ANC headsets and the SLM (sound level meter). To conduct the testing, the experimenter is supported by special EarQ software on the MEC, featuring an up/down-arrow-operated slider for each test frequency that the crewmember moves to the lowest sound pressure level at which the tone can still be heard. The baseline test is required not later than about Flight Day 14 for each new Expedition and is then generally performed once per month. Note: There have been temporary hearing deficits documented on some U.S. and Russian crewmembers, all of which recovered to pre-mission levels.]*

Later, after setting up the video equipment, Chamitoff underwent his first PFE (Periodic Fitness Evaluation) session on the CEVIS cycle ergometer, with Volkov assisting in filming Greg and obtaining his blood pressure measurements during the CEVIS workout. Subsequently, the FE-2 completed data entry and stowed the PFE and video hardware. *[The U.S. PFE w/o Blood Lab is a monthly 1.5-hr. procedure which checks up on blood pressure and electrocardiogram (ECG) during programmed exercise on the CEVIS (Cycle Ergometer with Vibration Isolation) in the Lab. Readings are taken with the BP/ECG (blood pressure/electrocardiograph) and the HRM (heart rate monitor) watch with its radio transmitter. BP/ECG provides automated noninvasive systolic and diastolic blood pressure measurements while also monitoring and displaying accurate heart rates on a continual basis at rest and during exercise.]*

Continuing Kibo laboratory outfitting, the FE-2 worked in the JPM (JEM Pressurized Module), removing the launch lock on the JPM internal port TV camera.

For setting up the Kibo SLT (Station Laptop Terminal), Chamitoff powered off the SSC-14 (Station Support Computer 14), relocated it in the JPM and plugged it into a new UOP (Utility Outlet Panel).

In the SM (Service Module), Kononenko downloaded protocol/log files of the BRI Smart Switch Router to the RSS1 laptop for subsequent dumping to the ground via OCA, for specialists to review issues, then rebooted the RRS1. *[BRI is part of the*

RS OpsLAN network with connections to the three SSC clients, the Ethernet tie-in with the US network, and a network printer in the RS (Russian segment).]

The FE-1 also performed functional verification of the ongoing radiation data monitoring for flux & dose rate data with the Matryoshka-R radiation payload via its Lulin-5 electronics box, supported by specialist tagup via S-band. *[Accumulated readings were recorded on a log sheet for subsequent downlink to TsUP/Moscow over the BSR-TM payload data channel.]*

Later, Kononenko unstowed the Lulin-ISS radiation complex kit, set up its ICU (Interface Control Unit, Russian: BUI) and connected it to a power outlet (PPS-26) with four PILLE radiation dosimeters, to allow their battery to recharge for the next 24 hrs. *[Done before on 4/24.]*

Performing routine maintenance on the primary CSA-CP (Compound Specific Analyzer-Combustion Products) instrument, Gregory replaced its battery (#1080) with a fresh one (#1329), then re-deployed the unit.

Kononenko conducted the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the passageways PrK (SM Transfer Compartment)–ATV, PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1.

Oleg also set up the pumping equipment and initiated (later closed out) the periodic transfer of urine from 9 EDV-U containers in the SM to the Rodnik BV2 tank of Progress M-64/29P, then flushed the system with ~5 L of disinfectant solution. *[Transfer hoses were discarded as usual.]*

As part of regular preventive maintenance of RS ventilation systems, Sergey meanwhile applied vacuum cleaner and soft brush to cleaning the detachable VT7 fan screens 1, 2 & 3 of the three SOTR (Thermal Control System) gas-liquid heat exchangers (GZhT4) In the FGB (Funktsionalnyi-Grusovoi Blok).

The FE-2 unstowed, activated and checked out a new AED (Automated External Defibrillator) in the CHeCS (Crew Health Care Systems) rack for future use on the ISS, disposing of the old defibrillator. *[The AED is a portable electronic device that automatically diagnoses the potentially life threatening cardiac arrhythmias of ventricular fibrillation and ventricular tachycardia in a patient. It then can treat them through defibrillation, i.e., the application of electrical therapy which stops the arrhythmia, allowing the heart to reestablish an effective rhythm. AEDs are generally either held by trained personnel who will attend events or are public access units which can be found in places including corporate and government*

offices, shopping centers, airports, restaurants, casinos, hotels, sports stadiums, schools and universities, community centers, fitness centers, health clubs and any other location where people may congregate.]

Afterwards, Gregory deployed a new CCPK (Crew Contamination Protection Kit, #1002) and new Eyewash Kit in the SM (near the SVO-ZV water tap/port).

Chamitoff also deployed new medical SODF (Station Operations Data File) books and updated checklists (cue cards), easily accessible in a Lab rack drawer used for medical items (LAB1D4_D1).

The FE-2 took measurements for the regular atmospheric status check for ppCO_2 (Carbon Dioxide partial pressure) in the Lab, SM (at panel 449) and COL (Columbus Orbital Laboratory), using the hand-held CDMK (CO_2 Monitoring Kit) #1002). *[The battery pack was to be replaced with the one from unit #1009 if necessary.]*

With the U.S. CDRA (Carbon Dioxide Removal Assembly) deactivated by the ground this morning (~5:00am-9:45am) and its cooling no longer required, Chamitoff demated and took down the ITCS LTL (Internal Thermal Control System/ Low Temperature Loop) jumper at the CDRA-supporting LAB1D6 rack.

After the hold put by the ground on the use of O_2 bottles (due to some corrosion observed on O_2 pressure gauges on ground units), Gregory took documentary close-up photography of the OUM-PFE (Oxygen Uptake Measurement - Periodic Fitness Evaluation) payload's DS (Gas Delivery System) for ground analysis.

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2/PFE), TVIS treadmill (CDR, FE-1), RED resistive exercise device (C DR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

Afterwards, Sergey transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Chamitoff conducted the periodic (every two weeks) inspection of the RED canister bolts, to be re-tightened if required. *[Deferred from 6/17.]*

The CDR completed the routine maintenance of the SOZh system (Environment

Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Volkov also performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Still remaining on the voluntary task list item for Kononenko & Volkov today was an audit of expired Expedition 16 food rations, with repacking & preparation of food packages for disposal on the ATV. *[To clear storage space for cargo items delivered on Progress M-64/29P.]*

At ~5:10am EDT, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU/*Glavnaya operativnaya gruppa upravleniya* = *"Main Operative Control Group"*), including Shift Flight Director (SRP), at TsUP-Moscow via S-band/audio, phone-patched from Houston and Moscow.

At ~6:05am, Sergey & Oleg linked up with TsUP stowage specialists via S-band to conduct the weekly IMS tagup, discussing stowage issues, equipment locations and Progress cargo transfers. *[Issues discussed today concerned Progress 29P unloading status, number of remaining ASU toilet replaceable rings, whereabouts of a specific cable, etc.]*

At ~3:10pm, the ISS crew is scheduled for their regular weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC (Station Support Computer)]*.

MT Translation: The planned move of the MT (Mobile Transporter) from WS-6 (Worksite 6) to WS-4 is now scheduled for today at ~3:00pm-4:30pm. Russian RCS (Reaction Control System) thrusters will be disabled for this purpose at 3:00pm - 5:30pm.

WRM Update: An updated Water Recovery Management "cue card" was uplinked for the crew's reference. *[The new card (17-0002M) lists 36 CWCs (~1448.4 L total) for the four types of water identified on board: technical water (694.6 L, for Elektron, flushing, hygiene, incl. 553.4 L non-usable water because of* Wautersia *bacteria), potable water (706.7 L, incl. 260.6 L currently on hold), condensate water (39.2 L), waste/EMU dump and other (7.9 L).* Wautersia *bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

CEO (Crew Earth Observations) photo targets uplinked for today were **Mt.**

Vesuvius *(Vesuvius is of course famous for its 79 AD eruption destroying the towns of Pompeii and Herculaneum. The volcano is still considered active and could erupt in the near future. The volcano's proximity to Naples is of great concern. Trying for nadir views of the volcano),* **Mt. Etna** *(Mount Etna, towering above Catania, Sicily's second largest city, has one of the world's longest documented records of historical volcanism, dating back to 1500 BC. Historical lava flows of basaltic composition cover much of the surface of this massive volcano, whose edifice is the highest and most voluminous in Italy. Context views of the volcano were requested),* **Central-Arizona Phoenix** *(the Central-Arizona Phoenix site is part of the Long Term Ecological Research [LTER] suite of sites. The main objective for these sites is to document the land cover/land use change on a seasonal basis. Looking for land cover or land use boundaries and document with overlapping frames),* and **Teide Volcano** *(the large triangular island of Tenerife is composed of a complex of overlapping volcanoes that have remained active into historical time. The United Nations Committee for Disaster Mitigation have designated Teide as a Decade Volcano. It is considered to be the 13th most dangerous volcano in the world due to its proximity to several major towns and the nearby city of Puerto de la Cruz. Contest views of the volcano were requested)*.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:48am EDT [= epoch]):*
Mean altitude -- 345.6 km
Apogee height -- 351.3 km
Perigee height -- 339.9 km
Period -- 91.45 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0008459
Solar Beta Angle -- -28.1 deg (magnitude peaking)
Orbits per 24-hr. day -- 15.75
Mean altitude loss in the last 24 hours -- 233 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54905

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 Undocking
09/09/08 -- Progress M-64/29P undocking (from FGB nadir)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**

10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/03/08 -- Soyuz TMA-13/17S relocation
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/23/09 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/19/08
Date:	Thursday, June 19, 2008 1:26:11 PM
Attachments:	

ISS On-Orbit Status 06/19/08

All ISS systems continue to function nominally, except those noted previously or below.

Small sleep cycle shift: The crew goes to sleep half an hour earlier tonight for a 30-min earlier wakeup tomorrow morning in support of the Orlan training exercise, enabling suit telemetry over RGS (Russian Groundsites).

Volkov & Kononenko completed the two-hour Part 2 of their second onboard "Profilaktika" (MBI-8, "Countermeasures") series of preventive health maintenance fitness testing on the treadmill, assisting each other in turn. *[Today's fitness test was performed on the TVIS in unmotorized (idle) mode, with free choice of speeds within the range permitted. The test investigates the action mechanism and efficiency of various countermeasures (currently VELO and TVIS) aimed at preventing locomotor system disorders in weightlessness. The test differs from the normal TVIS session by the use of the TEEM-100 gas analyzer (via a mask equipped with a pneumotachometer sensor), measurement of blood lactate level and subjective evaluation of physical exertion levels during the test. The lactate blood samples were taken twice at the end of the session, using the ACCUSPORT analyzer and REFLOTRON-4 accessories. Results were entered on a log sheet. TEEM and ECG (electrocardiograph) data were transferred to the RSE-Med laptop, also on a tape cassette (Cardiocassette-2000), and prepared for later downlink via Regul-Packet comm.]*

Sergey & Oleg also underwent their second periodic (generally monthly) health test with the cardiological experiment PZEh MO-1 ("Study of the Bioelectric Activity of the Heart at Rest") on the TVIS (Treadmill with Vibration Isolation System). *[During the 40-min. test, the crewmembers tagged up with ground specialists on an RGS (Russian ground site) pass on DO3 (~5:13am EDT) via VHF and downlinked data from the Gamma-1M ECG (electrocardiograph) for about 5-6 minutes.]*

The CDR performed the periodic service of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The regen process will be terminated before sleeptime, at ~4:20pm EDT. Regeneration of bed #2 follows tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle is normally done every 20 days, currently more frequently (last time: 6/13-14).]*

The crew conducted the regular fire drill/OBT (on-board training), a mandatory periodic one-hour exercise (including ground debrief conference). Primary goal of this Russian-led interactive exercise is to provide the station residents with the most realistic emergency training possible. The drill is always conducted with the support of both MCCs in close coordination. It should be performed every 2.5 months, but not later than 1 month prior to end of Increment. *[OBT objectives are to (a) practice fire response procedures (FRPs) and all incorporated actions for the case of a software-detected fire to locate, extinguish, and verify extinguishing attempts; (b) browse through RS laptop and the Signal-VM fire detection system displays as well as the automated software (algorithms) response to the fire event; (c) practice crew communication necessary to perform emergency FRPs; (d) ensure familiarization with support equipment (CSA-CP compound specific analyzer-combustion products, PBAs portable breathing assemblies, PFE/OSP-4 portable fire extinguishers, and IPK-1M gas masks to be used for fire suppression. These exercises do not actually use any fire equipment but simulate such actions to the maximum extent possible. The Emergency Procedures OBT concluded with a 15-min. debrief with Russian/U.S. ground specialists at ~4:00am EDT via S-band. The crew identified six Columbus locations where fireport labels did not match procedures; ESA is working to correct the discrepancies.]*

The CDR & FE-1 continued their preparations for the Orlan EVA (#20) on 7/10 and tomorrow's training exercise, performing further Orlan spacesuit activities in the DC1 "Pirs" Docking Compartment.
After configuring the DC1 communications link to support their presence, Volkov & Kononenko today –

- Completed individual fit sizing (central strap, lateral strap, hip strap, calf strap, arm cable and shoulder size, front & rear) on their suits *[#27 with red stripe for CDR, #26 with blue stripe for FE-1, #25 for recertification testing (life extension)]*,
- Ran leak checks & valve functionality tests on the Orlans and their BSS interface units in the DC1 & SM PkhO (Service Module Transfer Compartment) from the EVA support panels (POV);
- Performed leak checking on the backup bladder of suit #27, and
- Conducted pressure checks on the SM BK-3 oxygen (O_2) tanks and the

BNP portable repress O_2 tank in the DC-1 airlock module.

In the U.S. “Quest” Airlock, FE-2 Chamitoff continued post-EVA activities after 1J, closing down the regeneration of METOX (Metal Oxide) CO_2 absorption canisters #0020 & #0021 started yesterday, terminating the 13-hr discharge process on the 16-volt EMU (Extravehicular Mobility Unit) battery #2072 in the BCM-3 (Battery Charger Module 3) from yesterday and initiating the process on the second battery. *[BCM-4 is currently nonfunctional. The discharge process, originally handled manually by a crewmember, is an automated procedure controlled from an A31p SSC (Station Support Computer) laptop with a special DOS application.]*

In Japan’s Kibo laboratory, Chamitoff readied the SCOF (Solution Crystallization Observation Facility) and PCRF (Protein Crystallization Research Facility) payloads for operation by connecting their video cables to the IPU (Image Processing Unit) and bus cables to the ISPR UIP (International Standard Payload Rack Utility Interface Panel). *[The SCOF cell exchange door was then opened for photography of the SCOF interior setup.]*

The FE-2 also set up VAJ (Vacuum Access Jumper) connections from the Kibo WG (Waste Gas) and VV (Vacuum Vent) for initial VV exhaust gas activation.

The FE-1 performed potable water transfer from the Progress M-64/29P Rodnik tank #2 to several EDV containers in the SM, then compressed the tank #2 bladder. *[After hooking up the plumbing connecting the 29P water tank with the SM and EDV containers, the water was transferred at first in self-flow (under its own tank pressure), then using an electric compressor pump. Rodnik tank #1 in 29P is already filled with urine.]*

Chamitoff retrieved and stowed the four passive FMK (Formaldehyde Monitoring Kit) sampling assemblies deployed by him on 6/17 in the Lab (at P3, below CEVIS) and SM (at the most forward handrail, on panel 307), to catch any atmospheric formaldehyde on a collector substrate for subsequent analysis on the ground. *[Two monitors each are usually attached side by side, preferably in an orientation with their faces perpendicular to the direction of air flow.]*

After data download from the IWIS (Internal Wireless Instrumentation System, CDR Volkov restored the IWIS setup and stowed the equipment used for the download.

Greg Chamitoff conducted the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WRM (Water Recovery & Management (WRM)) assessment of onboard water supplies. *[Updated “cue cards” based on the crew’s water calldowns are sent up every other week. The current card (17-0002L) lists*

37 CWCs (~1457.2 L total) for the four types of water identified on board: technical water (694.6 L, for Elektron, flushing, hygiene, incl. 553.4 L non-usable water because of Wautersia bacteria), potable water (706.7 L, incl. 260.6 L currently on hold), condensate water (29.1 L), waste/EMU dump and other (7.9 L). Wautersia bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]

The FE-2 also prepared the second Icepac insertion into the MELFI (Minus Eighty Degree Laboratory Freezer for the ISS) in the Lab for upcoming sample stowage by retrieving two -32deg Icepac belts (#00070645J & #00062959J) from stowage and inserting them in Sections 3 & 4 of Tray A in Dewar 3. *[First insertion: 6/17.]*

Volkov completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Sergey also performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The CDR had 30 min reserved for transferring trash to the ATV (Automated Transfer Vehicle) and loading it aboard, guided by an uplinked cargo transfer list and stowage map (to ensure proper center-of-gravity positioning for post-undocking control).

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR/MBI-8, FE-1/MBI-8), and RED resistive exercise device (FE-2).

Afterwards, Gregory transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Still remaining on the voluntary task list item for Kononenko & Volkov today was an audit of expired Expedition 16 food rations, with repacking & preparation of food packages for disposal on the ATV. *[To clear storage space for cargo items delivered on Progress M-64/29P.]*

At ~12:45pm EDT, Flight Engineer Chamitoff participated in a live interactive PAO TV interview with KNTV-TV, San Jose, CA (Brent Cannon, Laura Garcia-Cannon)

from the Node-2. *[Greg has spent his early years in San Jose.]*

At ~1:05pm, CDR Volkov downlinked a crew message of congratulations to Cosmonaut Gennady Padalka, Commander of ISS Expedition 9 in 2004, who turns 50 on Saturday (6/21).

OUM-PFE Postponement: Today's scheduled preparations for Gregory's first session with the OUM-PFE (Oxygen Uptake Measurement - Periodic Fitness Evaluation) were postponed due to some corrosion observed in oxygen bottle pressure gauges on the ground, resulting in metallic debris. *[The bottles are part of the GDS (Gas Delivery System) in the HRF-2 (Human Research Facility 2) ground analog, and the O_2 is used to support OUM to evaluate crew health. The O_2 bottles will not be used until safety concerns due to possible FOD (Foreign Object Debris) in the O_2 lines can be addressed.]*

ATV Reboost Update: The ISS reboost with the ATV1 "Jules Verne" OCS (main propulsion) thrusters 1 & 3 was started at 2:41am EDT for 20 min 5 s and completed nominally. Actual Delta-V was 4.02 m/s vs. 4.02 m/s planned, resulting in a mean altitude increase of 7.04 km (3.80 nmi). Purpose of the reboost maneuver was altitude maintenance. ISS attitude control authority was handed over to RS MCS (Motion Control System) at 1:00am for the subsequent maneuver to reboost attitude at 1:05pm. After the burn, the station was turned back to TEA (Torque Equilibrium Attitude) and returned to US Momentum Management at ~3:40am. *[ATV "Jules Verne" has now successfully demonstrated all nominal functions intended for it (rendezvous & docking, cargo delivery, water transfer, propellant transfer, waste containment, and reboost) except for undocking and reentry.]*

MT Translation: A move of the Mobile Transporter from WS-6 (Worksite 6) to WS-4 is planned for tomorrow (9:58am-11:28am EDT).

Russian Orlan EVA: Planning is underway for the Russian EVA-20 from the DC1 on 7/10. If approved by the Partners, outboard activities by Volkov & Kononenko will include an inspection of the Soyuz TMA-12/16S docked at the DC1 nadir port and retrieval of a pyro bolt. The possibility of a second EVA about 4-5 days later is being kept in abeyance.

CEO (Crew Earth Observations) photo targets uplinked for today were **Yellow River Delta** *(although deltas typically have some cloud cover it looks like there should have been enough clear patches to take photos of this very dynamic delta. The Yellow River is the second-longest river in China. The Yellow River is called "the cradle of Chinese civilization" since its basin is the birthplace of the northern*

Chinese civilizations and was the most prosperous region in early Chinese history. The time series imagery of this region available to CEO researchers shows a delta that is highly dynamic, changing its course recently because of human induced changes. Context views of the delta were requested), **Karakoram** *(this is an extensively glaciated area with some of the world's longest mountain valley glaciers and elevations in the 20,000 to 29,000 ft range. This range spans the borders between Pakistan, China and India. Karakoram means "black gravel" in Turkic, as many of the glaciers are covered in rubble. K2, the second highest peak in the world is located within this mountain range. Documenting the extent of the glaciers. Context and overlapping views were requested),* **Santa Barbara Coast, California** *(the Santa Barbara Coastal Long Term Ecological Research [LTER] is located in the coastal zone of southern California near Santa Barbara. It is bounded by the steep east-west trending Santa Ynez Mountains and coastal plain to the north and the unique Northern Channel Islands archipelago to the south. Point Conception, where the coast of California returns to a north to south orientation, lies at the western boundary, and the Santa Clara River marks its eastern edge. The site lies on the active boundary of the Pacific Oceanic Plate and the North American Continental Plate. High levels of tectonic activity have created dramatic elevation gradients in both the terrestrial and the underwater landscapes of the site. Of interest are the effects of population and land use on this region. Overlapping images were requested),* and **Yellowstone National Park, Wyoming** *(Yellowstone NP is located mostly in the state of Wyoming, though some of it extends into Montana and Idaho. CEO researchers are currently monitoring the vegetation in the park on a seasonal basis. Regional views of the park were requested).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 9:55am EDT [= epoch]):*
Mean altitude -- 345.8 km
Apogee height -- 351.7 km
Perigee height -- 340.0 km
Period -- 91.45 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0008744
Solar Beta Angle -- -27.7 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.74
Mean altitude gain in the last 24 hours -- 7040 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54890

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 Undocking
09/09/08 -- Progress M-64/29P undocking (from FGB nadir)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/03/08 -- Soyuz TMA-13/17S relocation
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
02/12/09 -- STS-119/Discovery/15A launch – S6 truss segment
02/14/09 -- STS-119/Discovery/15A docking
02/23/09 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/18/08
Date:	Wednesday, June 18, 2008 1:23:29 PM
Attachments:	

ISS On-Orbit Status 06/18/08

All ISS systems continue to function nominally, except those noted previously or below. *>>>Today 25 years ago (June 18, 1983), Sally K. Ride became the first US woman to orbit the Earth. Launched on STS-7/Challenger, 32 years old at that time, she and her crew (CDR Bob Crippen) spent 6d 2h 23m in space.<<<*

Before breakfast & first exercise, Volkov, Kononenko and Chamitoff completed a full session with the Russian crew health monitoring program's medical assessment MO-9/Biochemical Urinalysis. Afterwards, the FE-1 closed out and stowed the Urolux hardware. *[MO-9 is conducted every 30 days (and also before and after EVAs) and is one of five nominal Russian medical tests adopted by NASA for U.S. crewmembers for IMG PHS (Integrated Medical Group/Periodic Health Status) evaluation as part of the "PHS/Without Blood Labs" exam. The analysis uses the sophisticated in-vitro diagnostic apparatus Urolux developed originally for the Mir program. Afterwards, the data are entered in the MEC (Medical Equipment Computer)'s special IFEP software (In-Flight Examination Program).]*

Later in the day, Volkov & Kononenko also completed the first part of the onboard "Profilaktika" (MBI-8, "Countermeasures") preventive health maintenance fitness test on the VELO bicycle ergometer, assisting each other in turn. Part 2, on the TVIS treadmill, is scheduled tomorrow. *[Test procedure for MBI-8, which requires workouts on the VELO and TVIS, is identical to the Russian MO-5 assessment, but in addition to the nominal procedure it uses the TEEM-100M gas analyzer with breathing mask, a blood lactate test with the ACCUSPORT analyzer and REFLOTRON-4 accessories, and a subjective evaluation of physical exertion levels during the test (using the Borg Perceived Exertion Scale, viz., 10 steps from very light over hard and very hard to maximum). Results are entered on a log sheet. TEEM and ECG (electrocardiograph) data are transferred to the RSE-Med laptop, also on a tape cassette (Cardiocassette-2000), and prepared for later downlink via Regul-Packet comm. Results are also called down to specialists standing by at TsUP.]*

Major focus for the CDR & FE-1 today continued to be on Orlan spacesuit activities in the DC1 “Pirs” Docking Compartment, spreading over several days, i.e., preparing spacewalk hardware for the Orlan EVA (#20) on 7/10 and prior simulation exercises.
After configuring the DC1 communications link to support their presence, Sergey & Oleg –

- Equipped Orlan suits #27 & #26 with their respective new BRTA telemetry units,
- Performed leak checks & valve functionality tests on the Orlan BSS interface units in the DC1 & SM PkhO (Service Module Transfer Compartment) from their EVA support panels (POV);
- Degassed the cooling system (i.e., separated liquid/gas) of the Orlans & their BSS suit interface unit in DC1;
- Degassed the BSS interface unit in SM PkhO,
- Set up & prepared Orlan ORUs (orbit replaceable units) such as oxygen (O_2) tanks, batteries, lithium hydroxide (LiOH) cans, moisture collectors & feedwater filters (OTAs on the Orlans also typically include a right-hand swing arm, tool caddy, trash bags and tethers), and
- Reset the DC1 comm system to its regular configuration.

In the U.S. “Quest” Airlock, FE-2 Chamitoff continued post-EVA activities after 1J, terminating the regeneration of METOX (Metal Oxide) CO_2 absorption canisters #0015 & #0016 started yesterday and initiating the bake-out process on the third METOX batch, #0020 & #0021, with CDRA operating nominally.

The FE-2 also terminated the 13hr discharge process on the 16-volt EMU (Extravehicular Mobility Unit) batteries #2067 & #2071 in the BSA (Battery Stowage Assembly), and then started the discharge on EMU battery #2072, using BSA BCM-3 (Battery Charger Module 3) only. *[After the RPC-6 (Remote Power Controller 6) “fuse” tripped open yesterday, BCM-4, which it controls, is currently inoperable. There are 4 BCMs in the Airlock, and BCM-4 is not one of the two BCMs that were replaced during the 1J Mission. RPC-6 remains open while specialists continue to analyze the data to determine the cause for the trip. The discharge process, originally handled manually by a crewmember, is an automated procedure controlled from an A31p SSC (Station Support Computer) laptop with a special DOS application.]*

In the COL (Columbus Orbital Laboratory), Greg Chamitoff conducted an inspection of the CWSA (Condensate Water Separator Assembly)’s desiccant module (DM) in the D1 rack. *[Before inspecting and photodocumenting the DM and adjacent condensate flex line, the routing of the D1 Rack TCS (Thermal Control System)’s*

flex hoses had to be corrected and the visible portion of the condensate flex line inspected for observable damages or anomalous bending. Afterwards, the D1 rack panel was closed again.]

Moving then to the Kibo JPM laboratory, Greg modified the SCOF (Solution Crystallization Observation Facility) payload from its "safed" launch configuration to its operation config. *[SCOF is a JAXA (Japan Aerospace Exploration Agency) subrack facility for investigations of crystal growth phenomena in microgravity, housed in the "Ryutai" (fluid) experiment rack, along with the FPEF (Fluid Physics Experiment Facility), PCRF (Protein Crystallization Research Facility) and the IPU (Image Processing).]*

From the JLP (JEM Logistics Pressurized Section), Chamitoff retrieved the OI-H (On-Orbit Installed Handrail) and LDFRs (Long Duration Foot Restraints), to be install during a future EVA externally on the JPM and JEMRMS (Robotic Manipulator System) console.

The FE-2 also retrieved hard dummy panels from the JLP forward standoff for subsequent assembly and installation in the Kibo laboratory.

Oleg Kononenko took the periodic sensor readings of the Russian "Pille-MKS" (MKS = ISS) radiation dosimetry experiment which has ten sensors placed at various locations in the Russian segment (DC1, SM starboard & port cabin windows, ASU toilet facility, control panel, etc.). *[Nine of the ten dosimeters are read manually.]*

Continuing the current round of preventive maintenance on the Russian Segment (RS) ventilation system, Sergey Volkov replaced the two dust filters PS1 & PS2 in the *Funktsionalnyi-Grusovoi Blok* (FGB), registering the change in the IMS (Inventory Management System).

Gregory conducted the periodic atmospheric sampling in the center of the Lab, SM and JLP with the GSC (Grab Sample Container), while Oleg, in parallel, used the AK-1M adsorber to collect cabin air samples in the SM and FGB.

The FE-1 also completed the periodic (about twice a month) replenishing of the Elektron oxygen generator's water supply for electrolysis, filling the KOV EDV container with water collected in CWC (Contingency Water Container) #1043 from the Lab CCAA (Common Cabin Air Assembly) dehumidifier. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron shutdown. With both Russian SKV air conditioners still not functioning, condensate is being produced (from air humidity) solely by the CCAA.]*

Kononenko completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Working off the Russian discretionary “time permitting” task list, Volkov performed the daily IMS maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Still remaining on the voluntary task list item for Kononenko & Volkov today was an audit of expired Expedition 16 food rations, with repacking & preparation of food packages for disposal on the ATV. *[To clear storage space for cargo items delivered on Progress M-64/29P.]*

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), RED resistive exercise device (FE-2) and VELO bike with bungee cord load trainer (CDR/MBI-8, FE-1/MBI-8).

Afterwards, Sergey transferred the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

In preparation for the ATV (Automated Transfer Vehicle) reboost tomorrow morning, Greg activated the RSUs (Remote Sensor Units) for the MAMS (Microgravity Accelerations Measuring System) and SAMS ICU (Space Acceleration Measurement System) as well as the EWIS (External Wireless Instrumentation System), for capturing structural dynamics data of the station during the event.

The new FE-2 again had about an hour for himself for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residence.

ATV1 Line Purge: After successfully transferring propellants from the ATV (Automated Transfer Vehicle) into ISS SM propellant tanks yesterday, ground personnel this morning (~2:35am EDT) conducted a propellant line purge, preceded by closure of the protective Lab science window shutters by Greg Chamitoff.

ATV1 Reboost: Tomorrow’s ISS reboost by the ATV main engines is scheduled for a TIG (Time of Ignition) of 2:41am EDT. Burn duration: 20 min 5,4 s, to yield a delta-V of 4.00 m/s (13.12 ft/s). The expected altitude gain (delta-H) is 6.92 km

(3.74 nm).

CEO (Crew Earth Observations) photo targets uplinked for today were **East Haruj Megafans** *(ancient rivers sourced in the Tibesti Mountains when the climate of the Sahara was wet [> 8000 years ago} have laid down vast spreads of sediment as a series of large fans ["megafans"] hundreds of km long and wide. A continuous pattern of criss-crossing stream channels, large and small, covers the entire surface of megafans. Flat "intercrater plains," measuring 104 km2 and covered solely with what appear to be numerous river channels, cover large areas of Mars. Earth's megafans may be the best analog for these plains. Images of areas south of Tibesti are only available in low resolution: therefore crew imagery--continuous mapping saths taken with 400- and 800 mm lenses--are needed to provide the detail to reveal evidence of stream processes),* **Nasser, Toshka Lakes, Egypt** *(through ISS imagery of this site researchers have noted that the Toshka Lakes water levels appear to be declining. Context views of the lakes to the west of Lake Nasser are requested),* **Central-Arizona Phoenix** *(the Central-Arizona Phoenix site is part of the Long Term Ecological Research [LTER] suite of sites. The main objective for these sites is to document the land cover/land use change on a seasonal basis. Looking for land cover or land use boundaries and document with overlapping frames),* **Barringer Impact Crater** *(Barringer, or Meteor Crater, has been dated at approximately 50,000 to 60,000 years old. It was the study of this crater by Gene Shoemaker that set the standard for the identification and confirmation of impact craters around the world. Nadir view of the crater was requested),* **Niwot Ridge Tundra, Colorado** *(Niwot Ridge is another of the LTER sites and is located approximately 35 km west of Boulder, Colorado, with the entire study site lying above 3000 m elevation. Documenting land cover boundaries with overlapping imagery),* and **Cedar Creek Area, Minnesota** *(this was the final LTER site for this day. Cedar Creek Natural History Area [CCNHA], established in 1940, was designated a National Natural Landmark by the National Park Service in 1975. In 1977 it was included as an Experimental Ecology Reserve in a proposed national network, and in 1982 it was one of 11 sites in the United States selected by the National Science Foundation for funding of LTER. Documenting the wetland and upland boundaries)*.

CEO photography can be studied at this “Gateway” website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:59am EDT [= epoch]):*
Mean altitude -- 338.8 km
Apogee height -- 342.6 km
Perigee height -- 335.0 km
Period -- 91.31 min.

Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005703
Solar Beta Angle -- -26.8 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 132 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54873

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
06/19/08 -- ATV1 Reboost (2:41am; delta-V ~ 4 m/s)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 Undocking
09/09/08 -- Progress M-64/29P undocking (from FGB nadir)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/03/08 -- Soyuz TMA-13/17S relocation
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/17/08
Date:	Tuesday, June 17, 2008 1:27:51 PM
Attachments:	

ISS On-Orbit Status 06/17/08

All ISS systems continue to function nominally, except those noted previously or below.

Major focus for CDR Volkov & FE-1 Kononenko today was on Orlan spacesuit activities in the DC1 “Pirs” Docking Compartment, to extend for the next several days, i.e., preparing spacewalk hardware for the EVA-20 on 7/10 and prior simulation exercises.
After configuring the DC1 communications system for their presence, Sergey & Oleg –

- Readied and checked out replaceable components (OTA) and auxiliary gear for their particular Orlan "skafandr" suits *[i.e., portable primary & reserve O_2 tanks (BK-3), storage batteries (825M3), LiOH canisters (PL-9), moisture collectors, liquid cooling garments (KVO), comm headsets (ShL-10), gloves (GP-10K), thermal comfort undergarments (BK-10), socks, diapers, filters for feedwater lines (FOR), Orlan CO_2 measurement units (IK), degassing pump unit (BOS), etc.],*
- Configured & tested the EVA support panels (POV) in the DC1 and SM PkhO (Service Module Transfer Compartment) *[to be used for leak checks and valve tests on the Orlan suits, their BSS interface units & the hatch KVDs (pressure equalization valves)],*
- Activated & inspected their spacesuits plus a third Orlan for training/testing *[Orlan #27 (red stripe) for Volkov, #26 (blue stripe) for Kononenko, #25 for testing & training],*
- Terminated the charging on the 825M3 battery pack started yesterday,
- Activated the training Orlan #25 and equipped it with the BRTA-25 telemetry system,
- Installed the 825M3 battery pack in the #25 backpack, and
- Reset the DC1 comm system to its regular configuration.

In the U.S. “Quest” Airlock, FE-2 Chamitoff –

- Terminated the regeneration of METOX (Metal Oxide) CO_2 absorption canisters #0011 & #0007 started yesterday and initiated the bake-out process on the second batch, #0015 & #0016, with CDRA operating nominally,
- Started the ~13hr discharge on the 16-volt EMU (Extravehicular Mobility Unit) batteries #2067 & #2071 in the BSA (Battery Stowage Assembly),
- Set up EMUs #3018 & #3004 with their SCUs (Service & Cooling Umbilicals) and initiated the standard 1hr scrubbing process on the spacesuits’ cooling water loops, filtering ionic and particulate matter (via a 3-micron filter), then
- Reconfigured the cooling loops and initiated the ~2hr biocide filtering *[loop scrubbing, incl. iodination of the LCVGs (Liquid Cooling & Ventilation Garments) for biocidal maintenance, is done to eliminate any biomass and particulate matter that may have accumulated in the loops],* and
- Terminated the scrubbing, disassembled the EMU water processing kit and stowed the equipment.

Kononenko serviced the Matryoshka-R (RBO-3-2) radiation payload which has taken over the ESA/RSC-Energia experiment ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS/ALC) with its Spectrometer (AST) and ALC equipment on DC1 panel 429. *[Oleg replaced the ALC-948 PCMCIA (Portable Computer Memory Card International Adapter) card with a new one (#949) and used the RSK1 laptop for checking the 948 card for quantity and total size of its stored files, before stowing it for return to earth.]*

The FE-2 performed the periodic deployment of four passive FMK (formaldehyde monitoring kit) sampling assemblies in the Lab (at P3, below CEVIS) and SM (at the most forward handrail, on panel 307) for two days, to catch any atmospheric formaldehyde on a collector substrate for subsequent analysis on the ground. *[Two monitors each are usually attached side by side, preferably in an orientation with their faces perpendicular to the direction of air flow.]*

The FE-1 conducted the monthly maintenance on the Russian IK0501 GA (gas analyzer) of the SOGS Pressure Control & Atmospheric Monitoring System, adjusting the sensor for O_2 readings. *[IK0501 is an automated system for measuring CO_2, O_2, and H_2O in the air as well as the flow rate of the gas being analyzed]*.

Sergey & Greg had about half an hour reserved to work on the CMRS (Crew Medical Restraint System), stowed in the CHeCS (Crew Health Care Systems) rack, performing the periodic checkout and inspection of the system for upcoming

standard CMO (Crew Medical Officer) proficiency training. *[The crew inspected the CMRS for cracks in the board and/or metal fastener exposed on top of CMRS (found on the ground units), either of which could provide a high-voltage defibrillation ground path from the patient to ISS structure. The board-like CMRS allows strapping down a patient on the board with a harness for medical attention by the CMO who is also provided with restraints around the device. The device can be secured to the ISS structure within two minutes to provide a patient restraint surface for performing emergency medical procedures, such as during ACLS (Advanced Cardiac Life Support). It can also be used to transport a patient between the station and the Orbiter middeck. It isolates the crew and equipment electrically during defibrillations and pacing electrical discharges, accommodates the patient in the supine zero-G positions, provides cervical spine stabilization and, for a three-person crew, can also restrain two CMOs during their delivery of medical care.]*

Kononenko set up the equipment for his second session with the Russian experiment MBI-18 DYKHANIE (“respiration”, “breathing”), then conducted the session, controlled from the RSE-Med laptop, followed later by Volkov who also undertook the experiment for the second time. The crewmembers took photographs of each other working the hardware, then closed down the payload and stowed it. *[Dykhanie-1 uses two body belts (PG-T/thoracic, PG-A/abdominal), a calibrator, resistor, mouthpiece, etc., to study fundamental physiological mechanisms of the external breathing function of crewmembers under long-duration orbital flight conditions. During the experiment, physiological measurements are taken and recorded with a pneumotachogram, a thoracic pneumogram, an abdominal pneumogram, and pressure data in the oral cavity. All experimentally derived plus salient environmental data along with personal data of the subject are recorded on PCMIA card for return to the ground at end of the Expedition. Objectives include determining the dynamics of the relationship between thoracic (pectoral) and abdominal breathing function reserves and their realization potential during spontaneous breathing, the coordinated spontaneous respiratory movements in terms of thoracic and abdominal components of volumetric, time & rate parameters of spontaneous respiratory cycle, identification of the features of humoral-reflex regulation of breathing by dynamics of ventilation sensitivity of thoracic and abdominal components to chemoreceptor stimuli, etc. Overall, the experiment is intended to provide a better understanding of the basic mechanisms of pulmonary respiration/gas exchange gravitational relations of cosmonauts.]*

Preparing for a repeat of the fine leak check on the Kibo JPM/JLP (JEM Pressurized Module/JEM Logistics Pressurized Section) vestibule deferred on 6/7, Chamitoff checked out the proper seating of JPM vacuum QD (Quick Disconnect) caps, then installed a cap on a connector of the JEMRMS BDS (JEM Robotic Manipulator System Backup Drive System) in the Kibo laboratory.

The FE-2 also prepared the MELFI (Minus Eighty Degree Laboratory Freezer for the ISS) in the Lab for upcoming sample stowage by retrieving two -32deg ICEPAC belts (#00070680J & #00070669) from stowage and inserting them in Sections 4 & 1 of Tray C in Dewar 1.

Afterwards, Gregory conducted the periodic offloading of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1054) with the collected water slated for processing. No samples were required. *[Estimated offload time before reaching the tank's neutral point (leaving ~6 kg in the tank): ~27 min. Condensate collection continues to be performed by the CCAA while the Russian SKV-2 air conditioner is off, awaiting its overdue Khladon (Freon-218) refill. SKV-1 has been nonfunctional for a long time.]*

Chamitoff also conducted the periodic (every two weeks) inspection of the RED (Resistive Exercise Device) canister bolts, to be re-tightened if required.

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), and RED resistive exercise device (CDR, FE-1, FE-2).

Afterwards, Oleg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

In preparation for the ATV (Automated Transfer Vehicle) reboost on 6/19 (2:41am EDT), Greg activated the SAMS ICU (Space Acceleration Measurement System/ Interface Control Unit), the control computer of the rack/drawer-based system for recording structural dynamics of the station.

At 1:25pm, Greg conducted the periodic VHF-1 emergency communications check over NASA's VHF (Very High Frequency) stations, today at the Wallops (1:44pm-1:46pm) and Dryden (1:33am – 1:40am) stations, talking with Houston/Capcom, MSFC/PAYCOM (Payload Operation & Integration Center Communicator) and Moscow/GLAVNI (TsUP Capcom) in the normal fashion via VHF radio from a handheld microphone and any of the USOS ATUs (Audio Terminal Units). *[Purpose of the test is to verify signal reception and link integrity, improve crew proficiency, and ensure minimum required link margin during emergency (no TDRS) and special events (such as a Soyuz relocation).]*

The three crewmembers had their standard periodic PMCs (Private Medical

Conferences) via S- & Ku-band audio/video, Oleg at ~9:55am, Sergey at ~11:35am, Greg at ~1:50pm EDT.

Kononenko completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Working off the Russian discretionary “time permitting” task list, Oleg also performed the daily IMS (Inventory Management System) maintenance, updating/ editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

A second voluntary task list item for Kononenko & Volkov today was an audit of expired Expedition 16 food rations, with repacking & preparation of food packages for disposal on the ATV. *[To clear storage space for cargo items delivered on Progress M-64/29P.]*

The new FE-2 again had about an hour for himself for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residence.

VOA Update: Shortly after yesterday’s ground-commanded activation of the EHS VOA (Environmental Health System/Volatile Organic Analyzer) in the Lab for a 4-hr sampling run, the unit performed an auto-shutdown with two pressure faults indicated. The engineering team is investigating

VolSci Program: For the Voluntary Science program on the weekend ahead (6/21-6/22), Greg Chamitoff was offered three choices for selection: (1) an “operations improvement” session with SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellites) with all three satellites (single-satellite experiments to test new thrusting algorithms and demonstrate safe trajectories for the inspection of space structures; two-satellite experiments to introduce new controllers and on-line path planning tools for purpose of docking to a complex tumbling satellite; three-satellite runs for formation flight experiments to test initialization of a formation and obstacle avoidance; (2) a LOCAD PTS (Lab-On-A-Chip Application Development – Portable Test System) session using Glucan LAL cartridges, targeting yeast & molds on ISS surfaces, preceded by an OBT review and PI teleconference, and (3) an EPO (Education Payload Operations) Demo on Space Careers, creating an educational video discussing different careers found at NASA, to be used to produce an educational product to enhance existing education resources for students in grades 9-12.

CEO (Crew Earth Observations) photo targets uplinked for today were **Mount Rainier** *(Mount Rainier, at 4392 m the highest peak in the Cascade Range, forms a dramatic backdrop to the Puget Sound region. The present-day summit cone was formed during a major mixed-magma explosive eruption about 2200 years ago and is capped by two overlapping craters. Rainier is located 54 miles southeast of Seattle, Washington. The most recent officially recorded volcanic eruptions occurred between 1820 and 1854. While there is no sign of an imminent eruption of Rainier, the volcano is not dormant and is expected to erupt again. This is especially significant because of the proximity of the volcano to the cities of Tacoma and south Seattle. About 5000 years ago the Osceola mudflow initiated by a Rainier eruption covered the site of present-day Tacoma),* and **Coast Mountains** *(these glaciers have been in a well-documented, heavy retreat for the past couple of decades even though they are located in a moist, marine environment, with heavy winter snowfalls and elevations ranging from 10,000 to 13,000 feet. Since we are approaching the summer solstice, the lighting is now best for photographing these ranges. Context view of the Coast Mountains is desired)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:41am EDT [= epoch]):*
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Perigee height -- 335.1 km
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Solar Beta Angle -- -25.4 deg (magnitude increasing)
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Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
06/19/08 -- ATV1 Reboost (2:41am; delta-V ~ 4 m/s)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 Undocking
09/09/08 -- Progress M-64/29P undocking (from FGB nadir)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)

10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/03/08 -- Soyuz TMA-13/17S relocation
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/16/08
Date:	Monday, June 16, 2008 1:19:18 PM
Attachments:	

ISS On-Orbit Status 06/16/08

All ISS systems continue to function nominally, except those noted previously or below. *>>>Today 45 years ago (June 16, 1963), Valentina Vladimirovna Tereshkova became the first woman to orbit the earth. Launched on Vostok 6, Mayor General Tereshkova (Codename Chaika, "Seagull"), 26 years old at that time, orbited the earth 48 times in 2d 22h 50m.<<< Underway: Week 9 of Increment 17.*

FE-2 Chamitoff ended his FD15 session with the NASA/JSC experiment NUTRITION w/Repository, his first, by collecting a final urine sample upon wakeup for storage in the MELFI (Minus-Eighty Laboratory Freezer for ISS). The sampling kit was then stowed away. Greg's next NUTRITION activity will be the FD30 session. *[The current NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

In the Service Module (SM), FE-1 Kononenko readied the newly installed Russian BIO-5 Rasteniya-2 ("Plants-2") experiment, replacing the root module with a new one from stowage, filling the KDV water canister, loading new software and running a hardware test, then starting the experiment. *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-13 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording.]*

CDR Volkov prepared for today's half-day wearing test of the spring-loaded "Penguin-3" antigravity pressure/stress suit with its load measuring system (SIN), calibrating the SIN, donning the suit and its equipment, then going about his regular daily activities and downloading performance measurements several times. Test close-out was at ~9:00am EDT. *[After each download, Sergey selected higher symmetrical (shoulders) & asymmetrical (chest & back) loads (~20-30 kgf), plus 2.5-4 kgf on the stirrups, after calibrating the system with no load on the suit's internal tension straps. Performance/body motion data were then collected by the SIN electronics (via analog-to-digital converters) and downloaded to an A31p laptop three times, followed by downlink to the ground via BSR-TM.]*

Performing maintenance on the Russian SKV-2 air conditioner, the CDR set up the manual pump assembly (SRN) and flushed (wetted) the evaporator wicks of the BTA heat exchanger. Afterwards, the plumbing circuit was disassembled and removed again. *[Condensate collection continues to be performed by the U.S. CCAA (Common Cabin Air Assembly).]*

To provide cooling for ground-commanded activation of the U.S. CDRA (Carbon Dioxide Removal Assembly), Greg Chamitoff connected the regular ITCS LTL (Internal Thermal Control System/Low Temperature Loop) coolant jumper connection to the LAB1D6 rack. *[CDRA activation took place at 7:45am-8:45am EDT.]*

The ground also commanded activation of the EHS VOA (Environmental Health System/Volatile Organic Analyzer) for a 4-hr sampling run. *[Nitrogen (N_2) consumption: 4-6 mL/min, power consumption: 220W peak, 160W avg.]*

With the CDRA running, the FE-2 worked in the A/L (Airlock) to initiate regeneration/"bake-out" on the second set of METOX (Metal Oxide) CO_2 filtration canisters used during the recent EVA Campouts (#0011, #0007).

Performing more outfitting in the Japanese Kibo laboratory, Chamitoff exchanged the PPRVs (Positive Pressure Relief Valves) in the JLP (JEM Logistics Pressurized Section) deck hatch and JPM (JEM Pressurized Module) overhead hatch with the standard MPEVs (Manual Pressure Equalization Valves) and checked their functionality. *[Between the two hatches is the JPM/JLP transfer tunnel (vestibule).]*

Also in the Kibo JPM, Greg installed Monitor #1 in the WS (Workstation) Rack on the overhead side. *[The SLT (Station Laptop Terminal) assembled as MKAM (Minimum Keep Alive Monitor) was already functioning in Node-2 for JLP access.]*

Continuing the current round of regular preventive maintenance of RS (Russian

Segment) ventilation systems, Volkov cleaned the protective TsV1 fan screen in the FGB.

In the SM, after configuring an electric pump with water transfer hoses & pressure adapter, Kononenko transferred water from the WDS (Water Delivery System) tanks of the ATV1 “Jules Verne” to four EDV containers.

In the DC1 (Docking Module), Sergey Volkov set up and initiated charging on an Orlan 825M3 battery pack from FGB stowage, preparatory to tomorrow’s scheduled Orlan spacesuit activations and checkout.

The three crewmembers performed a two-hour JEM (JPM+JLP) New Module “Delta” Emergency Procedure Drill, tailored for the new addition to the station. *[Purpose of the “Delta” OBT (Onboard Training) exercise, mandatory at no later than 7-10 days after arrival of the new module, was to familiarize the crew with JEM hardware and valves used in emergency situations and with the new Ammonia Detection Kit location, hardware and cue cards, and to review new, stand-alone JEM emergency procedures, including the “big picture” changes to the existing emergency procedures due to the new module addition. For example: the increased station volume increases the ISS reserve time in case of a leak (to ~1725 min, from ~1423 min); additional equipment safing would be required; the sequence of closing hatches for USOS (US Segment) leak checks will be impacted; more volume is now available for utilizing USOS atmosphere for RS (Russian Segment) leaks; while the automated response to a Rapid Depress situation for JEM is consistent with the automated response for the other USOS modules, although automatically commanded JEM hardware is added, etc. JEM has two ATUs (Audio Terminal Units) and two C&W (Caution & Warning) panels each on the JPM JEMRMS and WS racks. JLP does not have an ATU or C&W panel.]*

The CDR & FE-1 conducted the periodic (monthly) functional closure test of the Vozdukh CO_2 removal system’s spare emergency vacuum valves (AVK), in the spare parts kit. *[The AVKs are critical because they close the Vozdukh's vacuum access lines in the event of a malfunction in the regular vacuum valves (BVK) or a depressurization in the Vozdukh valve panel (BOA). Access to vacuum is required to vent CO_2 during the regeneration of the absorbent cartridges (PP). During nominal operation, the AVK valves remain open.]*

Volkov repeated the data download from the IWIS RSU (Internal Wireless Instrumentation System Remote Sensor Unit, #1027) in the SM after the failed first attempt on FD11 during 1J. *[The download configuration was then disassembled and the hardware stowed.]*

In the SM, Oleg took the periodic readings of potentially harmful atmospheric contaminants with the CMS (Countermeasure System) component of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite which uses preprogrammed microchips to measure H_2CO (Formaldehyde, methanal), CO (Carbon Monoxide) and NH_3 (Ammonia), taking one measurement per microchip. *[CMS is a subsystem of the Russian SKDS Pressure Control & Atmosphere Monitoring System.]*

Sergey completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV at the SKV-2 air conditioner for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

The CDR also performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Chamitoff completed the regular monthly & quarterly maintenance of the TVIS (Treadmill with Vibration Isolation & Stabilization), inspecting the condition of harnesses, belt slats, corner bracket ropes, IRBAs (Isolation Restorative Bungee Assemblies) and gyroscope wire ropes for any damage or defects, lubricating as required plus recording time & date values.

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

Afterwards, Greg transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

The new FE-2 again had about an hour for himself for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residence.

No CEO (Crew Earth Observation) photo targets uplinked for today.

CEO photography can be studied at this “Gateway” website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 5:28am EDT [= epoch]):*
Mean altitude -- 339.1 km
Apogee height -- 342.8 km
Perigee height -- 335.3 km
Period -- 91.31 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005557
Solar Beta Angle -- -23.5 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 75 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54840

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
06/19/08 -- ATV1 Reboost (delta-V ~ 4 m/s)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 Undocking
09/09/08 -- Progress M-64/29P undocking (from FGB nadir)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/03/08 -- Soyuz TMA-13/17S relocation
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation

05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/15/08
Date:	Sunday, June 15, 2008 12:15:47 PM
Attachments:	

ISS On-Orbit Status 06/15/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday -- off-duty for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff. Ahead: Week 9 of Increment 17.*

First activity this morning for Gregory Chamitoff was to start on his Flight Day 15 session with the NASA/JSC experiment NUTRITION w/Repository. This is an all-day session, the first for Greg, of collecting urine samples several times for 24 hrs, to continue through first void tomorrow morning.

Oleg Kononenko conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP-Moscow. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The FE-1 also gathered weekly data on Total Operating Time & “On” durations of the Russian POTOK-150MK (150 micron) air filter unit of the SM’s SOGS air revitalization subsystem for reporting to TsUP.

For Sergey Volkov, today’s Russian discretionary task list held one job – continuing the GFI-8 "Uragan" (hurricane) earth-imaging session begun two days ago, using the D2X digital camera with the F800 telephoto lens. *[Uplinked target areas were the forest cover on mountain slopes on the north shore of Lake Sevan, drilling platforms near the western shores & on the eastern shores of the Caspian Sea, the coastal strip of the Aral Sea (overlapping frames), the Katun river valley in nadir & to the right of track, the Eastern shores of Lake Teletsk, the forest condition in the Sayan mountains, the northern shore of Lake Baikal, wooded areas in Greece, the Danube river valley all the way to the estuary, scenic*

photography of the Crimea from different points on orbit, the Kerch Strait, the Don river valley, conditions of the Volga-Akhtubinsk flood plain during water reservoir releases, drill well fields along & to the south of Ural river, general views of the Pyrenees, of the Alps and the Carpathian mountains from various points on orbit, the Oka river and Don river valleys, and the valley of any other river between Don and Volga.]

Also working from the "if time permits" task list, the CDR conducted another run, his fifth, of the Russian DZZ-2 "Diatomeya" ocean observations program, using the NIKON-F5 DCS still camera and the HDV (high-definition) video camcorder from SM window 8 for ~20 min to record high production water areas for obtaining data on color field composition in dynamic regions of the ocean and in near-estuary areas of large rivers, plus the current cloud cover above these waters, its rating, and special forms of cloud formation. *[Target zones today were in the Atlantic Ocean (Cape Hatteras & English Channel).]*

For the FE-1, a discretionary task list job was another session for Russia's Environmental Safety Agency (EKON), making observations and taking KPT-3 aerial photography of environmental conditions of water contamination in the Kerch Strait using the Nikon D2X with the SIGMA 300-800mm telephoto lens.

At ~5:00pm EDT, Greg Chamitoff is scheduled for his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

No CEO (Crew Earth Observation) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
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Eccentricity -- 0.0005574
Solar Beta Angle -- -21.1 deg (magnitude increasing)
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07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 Undocking
09/09/08 -- Progress M-64/29P undocking (from FGB nadir)
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11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
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11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/14/08
Date:	Saturday, June 14, 2008 2:54:12 PM
Attachments:	

ISS On-Orbit Status 06/14/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – off-duty day for CDR Volkov, FE-1 Kononenko & FE-2 Chamitoff.*

STS-124/Discovery returned to Earth this morning after 13d 18h 13min in space, touching down at KSC on the first landing opportunity at 11:15am EDT, after 217 orbits & 5.7 million miles. *[During the ISS 1J mission, executed with stellar perfection, its seven-member crew conducted three EVAs, delivered & installed the JEM (Japanese Experiment Module) Kibo with its RMS (Robotic Maneuvering System), brought up new Expedition 17 crewmember Gregory Chamitoff and returned his predecessor Garrett Reisman who spent 95d 8h 47m in space (with ~89d on board ISS). It was the 123rd flight of a Space Shuttle, the 26th Shuttle mission to visit the station, the 35th for Discovery and the 69th landing at KSC. Welcome back, Discovery! Next up: STS-125/Atlantis on 10/8, on Service Mission 4 (SM4) to the Hubble Space Telescope (HST).]*

The FE-1 serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out" cycle to vacuum on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~5:15pm EDT. Filter bed #1 was regenerated yesterday. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle is regularly done every 20 days.]*

Having reached Day 15 of his flight, Greg Chamitoff began his first session with the NASA/JSC experiment NUTRITION w/Repository, for which he had to forego exercising and food intake for eight hours. Today's protocol consisted of blood draws. Later tonight, the FE-2 will also set up the equipment for the 24-hour urine collections which start with the first void early tomorrow morning and continue through Monday morning. *[After performing self-phlebotomy, i.e., drawing blood samples (from an arm vein), the samples were first allowed to coagulate in the*

Repository for 20-30 minutes, then spun in the HRF RC (Human Research Facility/ Refrigerated Centrifuge) and finally placed in MELFI (Minus-Eighty Laboratory Freezer for ISS). No thruster activity was allowed during the blood drawing. The RC was later powered off after a temperature reset to limit wear on the compressor, and cleaned. Background: NUTRITION is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight; this includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes. The Clinical Nutritional Assessment profile currently required on all U.S. Astronauts collects blood and urine samples preflight and postflight. NUTRITION expands this protocol by also capturing inflight samples and an additional postflight sample. Furthermore, additional measurements are included for samples from all sessions, including additional markers of bone metabolism, vitamin status, and hormone and oxidative stressor tests. The results will be used to better understand the impact of countermeasures (exercise and pharmaceuticals) on nutritional status and nutrient requirements. The Clinical Nutritional Assessment profile (MR016L), first started on two Mir crewmembers and then on all ISS US crews, nominally consists of two pre-flight and one post-flight analysis of nutritional status, as well as an in-flight assessment of dietary intake using the FFQ (Food Frequency Questionnaire). The current NUTRITION project expands MR016L testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the Service Module (SM) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

Volkov & Kononenko also performed regular maintenance inspection & cleaning on fan grilles in the FGB (TsV & TsV2), SM (VPkhO & VPrK), DC1 (V3), and COL (Columbus Orbital Laboratory) for ESA.

Additionally, CDR Volkov conducted the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Greg Chamitoff filled out the regular FFQ (Food Frequency Questionnaire), his first, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

At ~9:15am EDT, the crewmembers held their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP/Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

Afterwards, Greg transferred the crew's exercise data file to the MEC for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

The Russian crewmembers had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Oleg at ~7:00am, Sergey at ~8:40am.

For CDR Volkov, the Russian discretionary task list held one job for today – continuing the GFI-8 "Uragan" (hurricane) earth-imaging session begun yesterday, using the D2X with the F800 tele-lens. *[Uplinked target areas were the coastal line of Lesser Aral Sea, the northern section of the sea separated by a dam from the Greater Aral, Katunsky preserve inside of Katun river bend enveloping the mountains, South shores of Teletsk Lake, woodland area of Sayan mountains, Irkut river valley running in direction of Baikal, north shores of Lake Baikal near Angara, Trans-Baikal woodland area, woodlands near Russian population areas along Amur and Ussuri rivers, ocean shores, upper reaches of Mzymta river valley from Adler, Caucasus mountain range near Teberda-Donbai,*

flooded Volga-Akhtubinsk alluvial plain after water reservoir releases, oil spills on the north of Caspian Sea, the Yasnyi Cosmodrome left of track, Katun river valley, the western shore of Teletsk Lake in nadir woodland area of Sayan mountains, general view of Carpathian mountains, the valley of one of the rivers in Moldova, the Don river valley, wooded areas in Orenburg steppe, general view of the Ural mountains, the Irtysh river valley, general views of the Alps, general views of Byelorussia, Ugra National Park, Don river valley, general views of the Aral Sea, and the Kyrgyz mountain range to the west of Issyk-Kul.]

Also working from the "time permitting" task list, FE-1 Kononenko conducted another run, his sixth, of the Russian DZZ-2 "Diatomeya" ocean observations program, using the NIKON-F5 DCS and the HDV (high-definition) video camcorder from SM windows 8 for ~20 min to record high production water areas for obtaining data on color field composition in dynamic regions of the ocean and in near-estuary areas of large rivers, plus the current cloud cover above these waters, its rating, and special forms of cloud formation. *[Target zones today were in the Pacific Ocean (Tokelau Islands – Californian upwelling).]*

A second discretionary task list job for Oleg was a session for Russia's Environmental Safety Agency (EKON), making observations and taking KPT-3 aerial photography of environmental conditions of Astrakhan using the Nikon D2X digital camera with the SIGMA 300-800mm telephoto lens.

ITCS Temporary Leak Event: Yesterday a small leak occurred in a QD (quick disconnect) when the crew disconnected the ITCS LTL (Internal Thermal Control System/Low Temperature Loop) jumper to the AR (Air Revitalization) in support of the standard CDRA (Carbon Dioxide Removal Assembly) deactivation procedure. A second, larger leak occurred when the disconnect was repeated on ground advise. The AR Rack return side QD was subsequently disconnected with no leak occurring. The total accumulator quantity drop (all in the LTL) was about 18%, approximately 2 liters. The ITCS coolant is Toxicity-0, and the crew cleaned up completely after the leak, discarding the towels in a wet trash bag (if the coolant liquid is allowed to evaporate, the remaining dry biocide residue becomes Toxicity-1, possibly a mild irritant).

Weekly Science Update *(Expedition Seventeen -- Week 8)*

PADLES *(Passive Dosimeter for Lifescience Experiment in Space):* Twelve passive dosimeters were set up into JEM at different positions (6/12). *[Area PADLES measures radiation exposure levels onboard the ISS using passive & integrating dosimeters to detect radiation levels. These dosimeters are located near the biological experiment facilities and on the end of Kibo.]*

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Measurements continue in FGB module.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): In progress.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): The experiment platform continues to operate nominally. Its power feeder #1 has been de-activated to support the JEM install activities (EVA-2). After the EVA-2, the EuTEF instruments have then been re-activated nominally. A DHPU (Data Handling Processing Unit) software patch is currently developed to fix the link error issues encountered with DEBIE-2 and FIPEX instruments.- DEBIE-2: Link error still under investigation. Some short-duration science measurements are on going since 6/11;- DOSTEL: On-going science acquisition.- EuTEMP: Currently inactive as planned.- EVC: Right after the EuTEF platform re-activation, EVC was successfully powered on and acquired very good images of Europe. Unfortunately, further new attempts were not successful early this week.- EXPOSE: On-going science acquisition.- FIPEX: A

new script has been started after the re-activation of the EuTEF platform. The instruments sensors went off on 6/6, and the measurement sequence had to be restarted, no significant science impact. Now acquiring science. - MEDET: Acquiring science since 6/5. - PLEGPAY: Several measurements have been performed with the Langmuir probe instrument during the STS-124 (1J) docking maneuver. The instrument is now powered on, but not in science acquisition mode. Unfortunately, no Langmuir probe measurements could be planned in conjunction with the Shuttle undocking.- TRIBOLAB: The instrument has been put in Thermal Stabilization Mode after EuTEF power feeder #1 re-activation. Pin on Disk Run #4 (POD#4) experiment was successfully started on 6/12.

FSL (Fluid Science Laboratory): FSL MIL Bus cable repair was successfully performed on 5/5. After FSL Rack Activation from ground on 5/8, the ground confirmed that the FSL cables repair activities were successful. Further troubleshooting activities with CEM-U(pper) Optical Module are required.

GEOFLOW: A new lamp set is delivered by STS-124 (1J). The start of GEOFLOW is pending further FSL troubleshooting and remaining commissioning activities (check of FSL optical modes).

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: “Greg, thanks for all your work and dedication in obtaining your early Integrated Immune samples. They will provide us with valuable, early in-flight data that will help us asses the risk of immune deregulation in spaceflight.”

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Complete.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION w/REPOSITORY: Complete.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Inc16 samples have been downloaded with 15S and handed over to science team.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): In progress.

SOLAR (Solar Monitoring Observatory): A new Sun observation period has started on 6/3. After the JEM activation, SOLAR power feeder #1 has been reactivated, and we are now acquiring science nominally. Some criss-cross maneuvers have been successfully performed on 6/8 & 6/12. These activities aim at correlating the sun sensor positions on the SOLAR Coarse Pointing Device (CPD) and the SOVIM / SOLSPEC instruments. The SOLACES instrument was also used during these activities. The present Sun observation window will close on 6/16. - SOVIM: Acquiring science. - SOLSPEC: Acquiring science.- SOLACES: Acquiring science.

SOLO: Planned.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

3-D SPACE : PI (Principal Investigator)/crew conference was completed on 6/12. First session was performed (nominally, but with more crew time than planned) on 6/13. “Thank you for your efforts in getting the data for 3D-Space!”

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): The four ECs (Experiment Containers) of Rotor B are yet to be retrieved by the crew from the blocked Rotor B. BLB (BIOLAB) could not be activated from ground yet,

pending resolution of the Smoke Detector issue. After the 1J Flight, the remaining WAICO-#1 ECs will be disposed and replaced by six Reference ECs on Rotor B.

CEO (Crew Earth Observations): Ongoing.

No CEO (Crew Earth Observation) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 6:18am EDT [= epoch]):*
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Perigee height -- 335.4 km
Period -- 91.32 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005682
Solar Beta Angle -- -18.4 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 35 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54809

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
06/19/08 -- ATV1 Reboost
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from FGB nadir)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
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11/03/08 -- Soyuz TMA-13/17S relocation
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12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment

12/06/08 -- STS-119/Discovery/15A docking
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2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
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05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/13/08
Date:	Friday, June 13, 2008 2:01:18 PM
Attachments:	

ISS On-Orbit Status 06/13/08

All ISS systems continue to function nominally, except those noted previously or below.

Before breakfast, CDR Volkov, FE-1 Kononenko and FE-2 Chamitoff began their workday with the periodic session of the Russian biomedical routine assessment PZEh-MO-7/Calf Volume Measurement (third for CDR & FE-1, first for FE-2). *[Calf measurements (left leg only) are taken with the IZOG device, a custom-sewn fabric cuff that fits over the calf, using the knee and lower foot as fixed reference pints, to provide a rough index of deconditioning in zero-G and effectiveness of countermeasures.]*

The FE-1 performed the periodic service of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The regen process will be terminated before sleeptime, at ~4:30pm EDT. Regeneration of bed #2 follows tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle is normally done every 20 days.]*

For the benefit of the new US flight engineer, Gregory Chamitoff, CDR Volkov took Greg through the mandatory 60-min Emergency Event OBT (Onboard Training) drill for new crewmembers for situations such as rapid cabin depressurization or fire, involving all ISS modules including ATV (Automated Transfer Vehicle) "Jules Verne", COL (Columbus Orbital Laboratory) and the new Kibo laboratory. *[Russian, US and European experts stood by at TsUP/Moscow, MCC/Houston and COL-CC/Oberpfaffenhofen for consultation. The rule is that the Russian-led emergency exercise should be performed by every new station crewmember once within seven days after departure of the previous crew. Background: Purpose of the drill for new station residents is to (a) familiarize them with the location of hardware and the positions of valves used in emergency situations, (b) familiarize*

them with the translation routes to the Soyuz vehicle, (c) work through the Russian Segment (RS) hardware deactivation procedures, (d) familiarize them with the particulars of the scenario and the results of the previous US Segment (USOS) fire drill, and (d) practice crew interactions in emergency situations. Referring to EMER book crew procedures, first Sergey and Greg translated along the emergency egress path to the DC1 Docking Compartment (where Soyuz TMA-12/16S is currently docked), checking hardware such as the Sokol suits, cable cutters, fire extinguisher (OKR), gas masks (IPK), emergency procedures books, valve settings, hatch rubber seal & restraint integrity, etc. In the USOS the inspection focused on fireports in the Lab, Node and Airlock, readiness of CSA-CP (Compound Specific Analyzer-Combustion Products), ISS leak kit, PBAs (portable breathing assemblies) and PFEs (portable fire extinguishers), emergency procedures books, valve settings, integrity of hatch rubber seals, presence of hatch handrails, etc. The exercise was topped off by a thorough debrief with the ground via S-band. During the session, the crew simulated executing the planned emergency procedures while moving about the station. For the case of an onboard fire and for emergency descent, there are other mandatory emergency drill OBTs.]

With the U.S. CDRA (Carbon Dioxide Removal Assembly) deactivated by the ground yesterday (~12:50pm-5:50pm) and its cooling no longer required, Chamitoff today demated and took down the ITCS LTL (Internal Thermal Control System/Low Temperature Loop) jumper at the CDRA-supporting LAB1D6 rack.

FE-1 Kononenko had another 2 hrs set aside for more Progress M-64/29P unloading & cargo transfers, based on an uplinked cargo transfer list showing 231 items, and logging movements in the IMS (Inventory Management System) database.

The CDR meanwhile conducted the periodic inventory audit of ~30 Russian medical kits and items located in the Service Module (SM) medical cabinet and Progress. *[Purpose: to verify their availability, condition and stowage locations, weed out a number of discarded kits, replace medications in the Emergency First Aid Kit (NP-2 #A 082) with fresh supplies, and relocate/reconfigure medical kit contents.]*

Greg Chamitoff set up the new ESA/CNES experiment 3D-SPACE (Mental Representation of Spatial Cues During Space Flight) and then spent another half hour on his first experiment protocol, performing every exercise (Distance, Illusion, Writing) once to complete the activity. *[3D-SPACE is designed to identify accurate perception & localization of objects in the space environment as prerequisites for spatial orientation & reliable performance of motor tasks in microgravity. Humans have mental representations of their surroundings based on sensory information & experience. It is hypothesized that depth & distance perception of objects could be altered in space due to the absence of gravitational reference and ambiguous*

perspective cues. 3D-SPACE investigates (a) depth perception & the role of perspective cues using geometric illusions, (b) distance perception using both standard psychophysics tests & natural three-dimensional scenes presented on a virtual reality head-mounted display, and (c) the effects of cognitive vs. perceptual-motor changes using handwriting & drawing tests.]

Later, the FE-2 set up NASA's NUTRITION/Repository experiment hardware for his first blood draw scheduled tomorrow. For the phlebotomy (blood sample collection), Greg has to start fasting 8 hrs before, i.e., tonight, with only water consumption allowed. *[The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by supercold MELFI dewars), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

Kononenko had ~90 min set aside for the periodic equipment servicing in the SM's ASU toilet facility, changing out replaceable parts with new components, e.g., a filter insert (F-V), the pretreat container (E-K), and the E-K's hose. All old parts were discarded as trash. *[E-K contains five liters of pre-treat solution, i.e., a mix of H_2SO_4 (sulfuric acid), CrO_3 (chromium oxide, for oxidation and purple color), and H_2O (water). The pre-treat liquid is mixed with water in a dispenser (DKiV) and used for toilet flushing.]*

Volkov began a new round of periodic preventive maintenance of cabin ventilation systems in the RS (Russian Segment), today cleaning the "Group A" fan grilles in the SM.

On the TVIS (Treadmill with Vibration Isolation & Stabilization), Chamitoff prepared and formatted a new PCMCIA (Portable Computer Memory Card International Adapter) for storing his personal physical exercise data for subsequent download to the MEC (Medical Equipment Computer).

Sergey & Oleg each spent ~1.5 hrs on the TVIS for the periodic Russian PZE-MO-3 test for physical fitness evaluation, their first time, using the TVIS in unmotorized (manual control) mode and wearing the Kardiokassette KK-2000 belt with three chest electrodes. *[The fitness test, controlled from the RSE-Med laptop, yields ECG (electrocardiogram) readings to the KK-2000 data storage device, later downlinked via the BSR-TM payload telemetry channel. Before the run, the KK-2000 was synchronized with the computer date/time readings. For the ECG, the*

crewmembers worked out on the treadmill, first walking 3 min. up to 3.5 km/h, then running at a medium pace of 6.5 km/h, followed by the maximum pace not exceeding 10 km/h, then walking again at gradually decreasing pace.]

The CDR performed the regular bi-monthly reboot of the OCA Router and File Server SSC (Station Support Computer) laptops.

Using the hand-held CDMK (Carbon Dioxide Monitoring Kit, #1002), Chamitoff collected air measurements for the regular atmospheric status check for $ppCO_2$ (Partial Pressure Carbon Dioxide) in the Lab, SM (at panel 449) and COL, and recording CO_2 readings and battery "ticks". *[Batteries were to be replaced if necessary. After all readings were taken, the CDM was deactivated and returned to its stowage place at LAB1S2.]*

In the SM, Oleg completed the routine maintenance of the SOZh/ECLSS (Environment Control & Life Support System) complex, including ASU toilet facilities systems/replaceables, today working off the discretionary "as time permits" task list.

Also suggested for Kononenko on today's task list was another EKON KPT-3 session, making observations and taking aerial photography of environmental conditions of Aqtobe (Aktyubinsk) and water contamination in the Kerch Strait for Russia's Environmental Safety Agency (EKON) using the Nikon D2X digital camera with SIGMA 300-800mm telephoto lens.

For CDR Volkov, the discretionary task list held two jobs for today: (1) a session with the Russian GFI-8 "Uragan" (hurricane) earth-imaging program, using the D2X to take telephotos *[shooting the forest cover on mountain slopes on the north shore of lake Sevan, drilling platforms near western shores of the Caspian Sea, drilling wells on the eastern shore of the Caspian, the coastal strip of the Aral Sea with overlapping frames, general views of the Pyrenees, the Alps and the Carpathian mountains, the Oka and Don river valleys, all other river valleys between Don and Volga, and fields of drilled wells along Ural river]*; and (2) another run, his fourth, of the Russian DZZ-2 "Diatomeya" ocean observations program, using the NIKON-F5 DCS and the HDV (high-definition) video camcorder from SM windows 8 for ~20 min to record high production water areas in North Atlantic *[for obtaining data on color field composition in dynamic regions of the ocean and in near-estuary areas of large rivers, plus the current cloud cover above these waters, its rating, and special forms of cloud formation, for the Atlantic Ocean (coastal area of Brazil and the Strait of Gibraltar).]*

FE-2 Chamitoff had another hour for himself for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for

the first two weeks after starting station residency.

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR/MO-3, FE-1/MO-3), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

Afterwards, Oleg transferred the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~4:05am, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU; *[Glavnaya operativnaya gruppa upravleniya = "Main Operative Control Group"]*), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~4:50am EDT, the ISS crew (assembled in the Columbus laboratory on TV camera before flags of Germany, U.S., Russia and Japan) received a VIP call from Germany's Bundespräsident (Federal President) Horst Köhler from COL-CC/ Oberpfaffenhofen, accompanied by the Ambassador of the Holy See (Vatican) Dr. Jean-Claude Périsset, Bavaria's State Minister for Science, Research & the Arts Dr. Thomas Goppel, and former ESA astronaut Reinhold Ewald.

At ~8:40am, Sergey & Oleg linked up with TsUP-Moscow stowage specialists via S-band to conduct the weekly IMS tagup, discussing stowage issues, equipment locations and Progress cargo transfers.

WRM Update: An updated Water Recovery Management "cue card" was uplinked for the crew's reference. *[The new card (17-0002L) lists 37 CWCs (~1457.2 L total) for the four types of water identified on board: technical water (694.6 L, for Elektron, flushing, hygiene, incl. 553.4 L non-usable water because of Wautersia bacteria), potable water (706.7 L, incl. 260.6 L currently on hold), condensate water (29.1 L), waste/EMU dump and other (7.9 L). Wautersia bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

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Solar Beta Angle -- -15.4 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 195 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54796

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
06/14/08 -- STS-124/Discovery landing (KSC: 11:15am EDT – 1st opportunity; 2nd : 12:50pm).
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from FGB nadir)
09/10/08 -- Progress M-65/30P launch
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11/20/08 -- **ISS 10 Years**
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2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)

2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/12/08
Date:	Thursday, June 12, 2008 11:45:29 AM
Attachments:	

ISS On-Orbit Status 06/12/08

All ISS systems continue to function nominally, except those noted previously or below. *First day alone for CDR Volkov, FE-1 Kononenko and FE-2 Chamitoff. Off-duty day for the crew (except for necessary maintenance and voluntary tasks). Russian Holiday: Russia Day, established by Boris Yeltsin to celebrate national unity after the Russian parliament in 1990 formally declared its sovereignty.*

ISS crew sleep cycle returned to the nominal schedule of 2:00am – 5:30pm EDT

Upon wake-up, Sergey Volkov terminated his 4th MBI-12 SONOKARD experiment session for the long-term Russian sleep study, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

In the Kibo JPM (Japanese Pressurized Module) laboratory, FE-2 Chamitoff installed 12 area radiation dosimeters on the shell walls, then took documentary photographs of the setup for JAXA.

CDR Volkov dismantled the THC IMV (Temperature & Humidity Control/Intermodule Ventilation) air duct which was temporarily installed in Node-2 to support air circulation during the docked period.

Greg Chamitoff conducted the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WRM (Water Recovery & Management (WRM))

assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week. The current card (17-0002K) lists 37 CWCs (~1457.2 L total) for the four types of water identified on board: technical water (694.6 L, for Elektron, flushing, hygiene, incl. 553.4 L non-usable water because of Wautersia bacteria), potable water (706.7 L, incl. 260.6 L currently on hold), condensate water (48 L), waste/EMU dump and other (7.9 L). Wautersia bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

The FE-2 also updated his handheld PDA (Personal Digital Assistant) by plugging it into the A31p SSC5 (Station Support Computer 5) laptop to delete the PDA WorldMap Hi-Res image files and load it instead with new uplinked software for BCR (Bar Code Reader) operations with the IMS (Inventory Management System) database.

In the SM (Service Module), Oleg Kononenko completed the routine maintenance of the SOZh/ECLSS (Environment Control & Life Support System) complex, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

In the "Quest" Airlock, the FE-1 terminated the regeneration/"bake-out" on the METOX (Metal Oxide) CO_2 filtration canisters used during the recent EVA Campouts. This allowed the ground to conduct the deactivation of the onboard CDRA (Carbon Dioxide Removal Assembly) at 12:50pm-5:50pm.

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

Afterwards, Kononenko transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

The CDR & FE-1 had their weekly PFCs (Private Family Conferences) via S-band/ audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Sergey at ~6:15am, Oleg at ~7:50am.

At ~4:05am EDT, Volkov & Kononenko joined in downlinking a PAO TV message

of greetings to the participants of the 7th Russian Professional Skills Competition for the best Road Patrol (DPS) Officers in Moscow. *[“…Today we have the best Road Patrol Service inspectors from entire Russia gathered here near Moscow. Participation in such a competition is already a victory for each officer. You represent your region, therefore, the responsibility is enormous. For the past two years you were persistently getting yourselves ready for this trial. That makes you and us very much alike: only the best trained and capable of making the right decisions in difficult situations are sent to space, since our nations’ prestige is on stake here…”]*

At ~4:40am, Sergey & Oleg conducted a telephone conversation with Ekaterina Belograzova, editor of Rossiysky Kosmos Magazine. *[“How much has your life changed after the arrival of such a large and dynamic team? Please evaluate your colleagues’ work. And what did you do during that time?”; “Most likely, you performed a thorough inspection of the Japanese module. Tell us about it.”; “Garret Reisman handed over to Gregory Chamitoff. Does he, by any chance, have Russian roots? Do you know him? Tell us in few words about him.”]*

At ~11:50am, the crew tagged up with the Columbus Payload & Crew Operations Center (CADMOS) in Toulouse/France via S-band S/G audio channel to discuss upcoming COL (Columbus Orbital Laboratory) activities with ground personnel including Gilles Clement, the PI (Principal Investigator) of the new experiment 3D-SPACE. *[CADMOS (Centre d'Aide au Développement des activités en Micro-pesanteur et des Opérations Spatiales) is a facility of the French space agency CNES (Centre National d'Etudes Spatiales), charged with helping user teams to prepare and develop experiments requiring microgravity environment (ISS, automated spacecraft, Airbus-+0g, etc.). CADMOS, created in 1993 at CNES/ Toulouse to support all French manned flights performed on-board the MIR station or Shuttle missions, combines center functions of mission control, operation and exploitation.]*

At ~2:50pm, the crewmembers are scheduled for their regular weekly tagup with the Lead Flight Director at JSC/MCC-H, the first of the new 1J Stage.

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Perigee height -- 335.8 km
Period -- 91.33 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005613
Solar Beta Angle -- -8.4 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 15 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54761

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

STS-124 Timeline

- *6/13 – FD14 - Stowing; deorbit preps*
- *6/14 – FD15 - Deorbit burn*

06/14/08 -- STS-124/Discovery landing (KSC: 11:15am EDT 1st opportunity; 2nd: 12:50pm)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from FGB nadir)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/03/08 -- Soyuz TMA-13/17S relocation
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)

2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/11/08
Date:	Wednesday, June 11, 2008 12:43:12 PM
Attachments:	

ISS On-Orbit Status 06/11/08

All ISS systems continue to function nominally, except those noted previously or below. *(FD12 for STS-124/1J).*

ISS and STS-124/Discovery are flying in separate orbits again.

ISS crew wake-up shifted another 30 min. to the left (4:00am EDT), and CDR Sergey Volkov, FE-1 Oleg Kononenko and FE-2 Gregory (Taz) Chamitoff will go to bed two hours earlier tonight (~5:30pm) to move their circadian cycle back to the nominal schedule.

For the Russian Sleep study, FE-1 Oleg Kononenko terminated his fourth MBI-12 SONOKARD experiment session upon wake-up by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. CDR Sergey Volkov in turn will start his fourth overnight MBI-12 data take tonight. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

After final departure preparations on both sides of the hatches (closed yesterday on ISS side at 4:24pm EDT), Discovery undocked this morning exactly at 7:42am from PMA-2 (Pressurized Mating Adapter 2) after a total docked time of 8d 17h 39m. *[For undocking, the station was turned from -XVV through ~180 deg to +XVV ZLV (+x-axis in velocity vector, z-axis in local vertical, i.e., flying Shuttle in front again) at ~6:22am, put briefly on free drift for the undocking, and then moded to 1J Stage attitude of +XVV TEA (Torque Equilibrium Attitude).]*

After separation, Discovery completed a 360-deg station flyaround and obtained imagery of the ISS with the newly-delivered Kibo JPM (Japanese Pressurized Module), JEMRMS (JEM Robotic Manipulator System) and relocated JLP (JEM Logistics Pressurized Module. *[JPM added approximately 32,590 lb mass to the ISS.]*

KSC landing is nominally expected on 6/14 (Saturday) at ~11:02am EDT. *[If the landing occurs as planned, STS-124/1J mission duration will be 13d 18h. Garrett Reisman's total time in space will be 95d 8h 34m, with ~89d on board ISS.]*

Before and during the undocking, CDR Volkov stood by at the Cupola A31p laptop with a stopwatch to monitor the proper performance of automatic undocking software for the PMA-2 departure under Russian thruster attitude control. *[The procedure provides for the crewmember to take over the automatic operational attitude control sequence manually if the software does not resume control after the period of free drift a few minutes after physical separation. Free drift is employed to prevent a conflict between the control systems of the two vehicles (ISS & Shuttle) and to "limp" (unload) the docking mechanisms.]*

Later, the CDR powered down the Cupola RWS (Robotics Workstation) laptop.

FE-2 Greg Chamitoff used the Kodak DCS760 digital camera and PD-100 camcorder to document the undocking, backing away & separation of the Discovery.

After undocking, the FE-2 depressurized the PMA-2 to prevent humidity condensation and pressure fluctuations. Leak checking by Gregory followed after the standard one hour. Afterwards, the necessary testing equipment was torn down.

Volkov then completed the reconfiguration of the Russian telephone/telegraph subsystem (STTS) to its post-undocking settings, from its primary string back to nominal mode on the backup string. This also severed the VHS (UHF) channel to the receding Shuttle Orbiter and restored the RSA-2 S/G (Space-to-Ground) comm configuration on Panel 3. *[The "Voskhod-M" STTS enables telephone communications between the SM, FGB, DC1 Docking Compartment and U.S. segment (USOS), and also with users on the ground over VHF channels selected by an operator at an SM comm panel, via STTS antennas on the SM's outside. There are six comm panels in the SM with pushbuttons for accessing any of three audio channels, plus an intercom channel. Other modes of the STTS include telegraphy (teletype), EVA voice, emergency alarms, Packet/Email, and TORU docking support.]*

Greg Chamitoff, the new FE-2, deconfigured the BPSMU (Battery Powered Speaker

Microphone Unit) and its long drag-through cable, used during the docked phase, and stowed the equipment.

Terminating the video setup, Chamitoff removed the J-1 VCP cap of the VDS (Video Distribution System) in Node-2 from video port S3 (camcorder port).

The CDR & FE-1 had another ~3.5 hrs set aside for more Progress 29P unloading & cargo transfers, referring to an uplinked cargo transfer list showing 231 items and logging movements in the IMS (Inventory Management System) database. Transferred items included a new Orlan spacesuit telemetry unit (BRTA) which Oleg stowed in the FGB (panel 112).

The FE-2 performed the periodic offloading of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1062) with the collected water slated for processing. No samples were required. *[Transferred quantity is determined by allowing tank and CWC equalize with each other. Tank quantity stabilizes at a value higher than the neutral point. Waiting time ~30 min.]*

Oleg completed the periodic (about twice a month) replenishing of the Elektron oxygen generator's water supply for electrolysis, filling the KOV EDV container with water collected in CWC (Contingency Water Container) #1043 from the Lab CCAA (Common Cabin Air Assembly) dehumidifier. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron shutdown.]*

In the SM (Service Module), Kononenko completed the routine maintenance of the SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

CDR Volkov completed the daily IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/ import to its three databases on the ground (Houston, Moscow, Baikonur).

Kononenko conducted the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the passageways PrK (SM Transfer Compartment)–ATV, PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1.

In the US A/L (Airlock), the new Flight Engineer began the bake-out/regeneration process on the METOX (Metal Oxide) canisters used in the A/L for CO_2 (carbon dioxide) removal during the EVA campouts. *[In the EMUs (Extravehicular Activity Units), nonregenerative LiOH (Lithium Hydroxide) filter cans were used for CO_2 control.]*

FE-1 Kononenko assisted with the METOX regen and then spent an additional 30 min in the A/L to deconfigure and clean up "Quest" after its support of the recent three 1J spacewalks.

After setting up and initializing the new Bubble dosimeters of the RS radiation payload suite "Matryoshka-R" (RBO-3-2) on 6/6, FE-1 Kononenko today collected the dosimeters for a checkout and recording of accumulated measurements (bubbles). *[A total of seven Bubble dosimeter detectors (A01-A08, A05 not used) were retrieved and "read" in the Bubble dosimeter reader in the SM. The results were reported to TsUP/Moscow via log sheet on the BSR-TM payload channel. The complex Matryoshka payload suite is designed for sophisticated radiation studies. Note: Matryoshka is the name for the traditional Russian set of nested dolls.]*

Sergey Volkov began the planned use of the ATV1 (Automated Transfer Vehicle 1) "Jules Verne" as a trash can by transferring accumulated waste and discarded equipment from the SM to the ATV. *[Masses & stowage locations of discarded items are tracked carefully for adequate vehicle CG (Center-of-Gravity) analysis prior to ATV departure.]*

In the Lab, FE-2 Chamitoff performed troubleshooting on the ANITA (Analyzing Interferometer for Ambient Air) experiment which had stopped downlinking all required spectra files. *[Log files indicate that this issue is due to lack of memory. Today's troubleshooting will help the ground to determine if there is a memory issue with the A31p laptop. After this procedure was executed, ground commanding took over to continue troubleshooting.]*

The ISS crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1). For Taz, this started his regular daily exercise regimen.

Afterwards, Chamitoff transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM

storage medium (done six times a week).

At ~8:25am EDT, Volkov & Kononenko joined in downlinking two PAO TV messages of greetings & congratulations to TsUP/Moscow for later replay at two events: (1) the start of the 24-hr automobile race at Le Mans, France, on 6/14, and (2) the 10th anniversary of the Telecommunications Systems Operation Complex (TsENKIKOM) at Baikonur, Kazakhstan. *[(1) For the Le Mans event, which will be attended by Jean-Loup Chrétien, Mark Brown, Vladimir Titov and Michel Tognini: "…On the occasion of the centennial of the first flight by aviation pioneer Wilbur Wright, we are honored to take part in the start of Le Mans 2008 from the ISS…"; (2) "…The Complex contributed tremendous efforts and energy to implementing Russia's space programs involving Baikonur launches, and to improving the reliability and quality of the entire Roskosmos communications system. The formation of the Telecommunication Systems Operation Complex marked the beginning of a civil component on the Baikonur launch site…".]*

Consumables Transfer Update: During the STS-124/1J docked period, a total of 783.5 lbs (355.3 L) of water was transferred to the ISS, in 7 CWCs (Contingency Water Containers, 662.0 lbs/300.1 L) and 6 PWRs (Payload Water Reservoirs, 121.5 lbs/55.2 L). Water samples were collected during each CWC fill. Nitrogen (N2) transfer to ISS: 15 lbs (6.8 kg). Fresh LiOH canisters to ISS: 14; used LiOH cans to Shuttle: 14.

WDS Update: An updated Water Delivery System "cue card" was uplinked for the crew's reference. *[The new card (17-0002K) lists 37 CWCs (~1457.2 L total) for the four types of water identified on board: technical water (694.6 L, for Elektron, flushing, hygiene, incl. 553.4 L non-usable water because of Wautersia bacteria), potable water (706.7 L, incl. 260.6 L currently on hold), condensate water (48 L), waste/EMU dump and other (7.9 L). Wautersia bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

Planning for Russian EVA-20: Houston & Moscow teams are beginning work on the requirements & activities needed to support the next Russian spacewalk, to be conducted by Volkov & Kononenko in Orlan suits from the "Pirs" DC1 Docking Compartment on 7/10 (current tentative date). RSC-Energia indicated this morning that in addition to the originally planned payload tasks the spacewalkers will also conduct an inspection of the Soyuz 16S spacecraft (behind thermal covers) in support of the on-going investigation of the Soyuz TMA-11/15S entry anomaly.

No CEO (Crew Earth Observation) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:

http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 6:43am EDT [= epoch]):*
Mean altitude -- 339.6 km
Apogee height -- 343.5 km
Perigee height -- 335.8 km
Period -- 91.33 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005613
Solar Beta Angle -- -8.4 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 15 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54761

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

STS-124 Timeline

- *6/12 – FD13 - Mostly off-duty*
- *6/13 – FD14 - Stowing; deorbit preps*
- *6/14 – FD15 - Deorbit burn*

06/14/08 -- STS-124/Discovery landing (KSC: ~11:02am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from FGB nadir)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/03/08 -- Soyuz TMA-13/17S relocation
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD

3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/10/08
Date:	Tuesday, June 10, 2008 1:09:07 PM
Attachments:	

ISS On-Orbit Status 06/10/08

All ISS systems continue to function nominally, except those noted previously or below. *Flight Day 11 (FD11) of STS-124/1J.*

JAXA/Japan to IMMT: *"Arigato Gozaimasu! This flight was 100% successful for the Kibo elements. Thank you to everyone involved for the excellent support in preparation and execution of this mission!"*

ISS crew work cycle (now including Greg Chamitoff) shifted another 30 min. to the left: wake-up 4:32am EDT; sleep 7:32pm (Shuttle crew 30 min later: 8:02pm, now including Garrett Reisman).

Crew activities aboard the ISS stack addressed five major areas: (1) Waste water dump from the Orbiter, (2) installation of JEM RMS Backup drive system, (3) PAO event, (4) Crew Sayonara, (5) hatches closing & ODS leak check.

For the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function), FE-2-17 Chamitoff drew his first venous blood sample, assisted by FE-2 Reisman, for return to Earth. *[IMMUNE protocol requires the collection to occur first thing post-sleep, before eating, drinking and brushing teeth, and all samples are stored at ambient temperature. Along with NUTRITION (Nutritional Status Assessment), INTEGRATED IMMUNE samples & analyzes participant's blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects.]*

Sergey Volkov & Oleg Kononenko set up the hardware for the Russian MBI-21 PNEVMOKARD experiment and conducted the session, their second, which forbids moving or talking during data recording. The experiment is controlled from the RSE-

Med A31p laptop, equipped with new software, and uses the TENZOPLUS sphygmomanometer to measure arterial blood pressure. *[PNEVMOKARD (Pneumocard) is an attempt to obtain new scientific information to refine the understanding about the mechanisms used by the cardiorespiratory system and the whole body organism to spaceflight conditions. By recording (on PCMCIA cards) the crewmember's electrocardiogram, impedance cardiogram, low-frequency phonocardiogram (seismocardiogram), pneumotachogram (using nose temperature sensors), and finger photoplethismogram, the experiment supports integrated studies of (1) the cardiovascular system and its adaptation mechanisms in various phases of a long-duration mission, (2) the synchronization of heart activity and breathing factors, as well as the cardiorespiratory system control processes based on the variability rate of physiological parameters, and (3) the interconnection between the cardiorespiratory system during a long-duration mission and the tolerance of orthostatic & physical activities at the beginning of readaptation for predicting possible reactions of the crewmembers organism during the their return to ground.]*

The CDR conducted the periodic (monthly) functional closure test of the Vozdukh CO_2 removal system's spare emergency vacuum valves (AVK), in the spare parts kit. *[The AVKs are critical because they close the Vozdukh's vacuum access lines in the event of a malfunction in the regular vacuum valves (BVK) or a depressurization in the Vozdukh valve panel (BOA). Access to vacuum is required to vent CO_2 during the regeneration of the absorbent cartridges (PP). During nominal operation, the AVK valves remain open.]*

In the SM (Service Module), Volkov took the periodic readings of potentially harmful atmospheric contaminants with the CMS (Countermeasure System) component of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite which uses preprogrammed microchips to measure H_2CO (Formaldehyde, methanal), CO (Carbon Monoxide) and NH_3 (Ammonia), taking one measurement per microchip. *[CMS is a subsystem of the Russian SKDS Pressure Control & Atmosphere Monitoring System.]*

Kononenko conducted the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the passageways PrK (SM Transfer Compartment)–ATV, PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1. *[This checkup is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).]*

FE-2 Reisman deactivated the CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) incubator payload and removed its processed experiment contents for return to Earth. *[After uncabling & opening CGBA-5 to access its interior, Garrett took out the Silica Garden Habitat and used Petri Dish, packed the items for return in a Ziploc bag, inserted a new Silica Garden Hab in the incubator and closed & recabled the payload for future ops.]*

After yesterday's procedures review, Garrett & Greg completed packing frozen samples from MELFI (Minus-Eighty Laboratory Freezer for ISS) dewars in Icepac DCBs (Double Cold Bags) for return on 1J. *[Exposure of retrieved samples was to be minimized to prevent science warm-up/loss, and the DCB was stowed carefully in a Shuttle middeck locker.]*

MS1 Karen Nyberg & MS4 Aki Hoshide had four hours reserved each for working in the Kibo JPM (Japanese Pressurized Module) to set up and check out the BDS (Backup Drive System) for the JEM RMS (Robotic Manipulator System) at the RMS console. *[RMS nominal Configuration #1 was used for BDS stand-alone checkout (BDS Configuration #2 is used for MDP {Management Data Processor}, ACU {Arm Control Unit} or RIP {Remote Interface Panel} failure, and Config. #3 is used if the PDB {Power Distribution Box} fails). The RMS is a single-string system (i.e., no Channel A or B like the SSRMS), but BDS is available in the case of an anomaly, using power from an ISS UOP (Utility Outlet Panel) to provide a redundant means to control the MA (Main Arm) into a safe configuration. The BDS is external to the JEMRMS console (i.e., the crew interface) and is now mounted on the closeout panel at the right side of the JEMRMS Rack. Background: When not deployed, the JEMRMS is secured at the portside (outboard) end of the Kibo module with three HRMs (Hold & Release Mechanisms) which are opened or closed via a panel on the operator's console. The RMS MA is about 10 m long, with three booms connecting six joints (shoulder yaw, shoulder pitch, elbow pitch, wrist yaw, wrist pitch, wrist roll) and two cameras on the MA. An additional small, fine arm of 2 m length will be delivered on Mission 2J/A (STS-127). Primary function of the JEMRMS is to manipulate ORUs (Orbital Replaceable Units) and move them between the JEM Airlock, the EF (Exposed Facility) and the ELM-ES (Experiment Logistics Module-Exposed Section). EF & ELM-ES will be delivered on 2J/A.]*

In the US A/L (Airlock), CDR Mark Kelly terminated the recharge process on the EVA/EMU batteries.

Kelly & Kononenko ended the N_2 (nitrogen) transfer from the Shuttle to the ISS HPTs (High-Pressure Tanks) and tore down the transfer equipment.

Mark & Oleg also dismantled & removed the Node-2 oxygen supply line that was

used to pipe O_2 from the Shuttle to the ISS PBAs (Portable Breathing Apparatus) to support pre-EVA mask prebreathing for denitrogenation.

The FE-1 had another hour set aside on his schedule to look for a jumper cable which could not be located during the installation of VSPLESK ("Burst") science hardware on 5/27.

Volkov completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Kononenko reloaded the two VTRs (Video Tape Recorders) of the VDS (Video Distribution Subsystem) with fresh tapes after taking the existing tapes from the machines, labeling them and stowing them for return to MCC-Houston.

At ~7:42am, PLT Ham & CDR Kelly initiated another periodic waste water dump from the Orbiter, the fifth since mission start. One additional water ventings is scheduled. *[After attitude control handover from ISS to Shuttle at 7:32am, the ISS/ Shuttle stack was maneuvered from the current TEA (Torque Equilibrium Attitude) to the proper attitude (nozzles facing retrograde) for the venting from PWRs (Payload Water Reservoirs) & CWCs (Contingency Water Containers) and returned later to TEA. Attitude control was returned to ISS momentum management at ~10:25am.]*

Reisman, slated for return on the Discovery on 6/14, and Chamitoff, who replaces him as ISS FE-2, had 3-4 hours remaining for standard joint "handover" activities.

Kelly & Ham had a final five hours reserved to finish up on Shuttle/ISS cargo transfers, with a tagup with ground specialists and calldown of transfer status at ~11:45am. *[As of this morning, the crews were 98% complete on resupply transfers, 81% complete on return cargo, and 87% complete overall. The remaining transfers were completed today (with no margin left).]*

The ISS crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-1, FE-2, FE-2-17), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (CDR). Day 4 of CEVIS physical exercise for Greg Chamitoff.

Afterwards, Volkov transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart

Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~2:10pm EDT, STS-124 Mission Specialist Garrett Reisman & ISS Flight Engineer Greg Chamitoff will be participating in three live interactive PAO TV interviews, with NBC News (Tom Costello), KGO Radio (Gil Gross), and FOX News Radio (Holly Hickman).

Volkov & Kononenko are scheduled for their regular periodic PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Sergey at ~6:17pm, Oleg at ~6:32pm.

At ~7:22pm, just before sleep time, Oleg will again set up the Russian MBI-12 SONOKARD (Sonocard) payload and start his fourth experiment session, using a sports shirt from the SONOKARD kit with a special device in the pocket for testing a new method for acquiring physiological data without using direct contact on the skin. Measurements are recorded on a data card for return to Earth. Sergey will start his third MBI-12 session tomorrow evening. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

The traditional **Crew Farewell** ceremony is timelined for ~3:57pm EDT, followed by air duct removal and hatch closure at ~4:10pm, handled on the ISS side by Volkov, Kononenko and Chamitoff. *[Afterwards (~4:30pm), Kelly & Ham switch attitude control authority of the mated stack from ISS CMG TA (Control Moment Gyroscope Thruster Assist) mode to Orbiter control and conduct the standard one-hour leak check on the ODS (Orbiter Docking System).]*

Discovery is scheduled to **undock** from ISS tomorrow morning at 7:42am, shortly after local midnight to ensure good lighting for the subsequent flyaround (starting at 8:16am, about 9 min after local sunrise), for a total docked time of 8d 17h 39m. After a one-orbit flyaround for photo imaging at 400-600 ft, first separation burn of Discovery will be at 9:12am. Landing is set for Saturday, 6/14, nominally at KSC at 11:02am EDT. If so, total mission duration for STS-124/1J will have been 13d 18h. Garrett Reisman's total time in space will be 95d 8h 34m, with ~89d on board ISS.

Planning for Russian EVA-20: Houston & Moscow teams are beginning work on the requirements & activities needed to support the next Russian spacewalk, to be conducted by Volkov & Kononenko in Orlan suits from the "Pirs" DC1 Docking

Compartment on 7/10 (current tentative date). RSC-Energia indicated this morning that in addition to the originally planned payload tasks the spacewalkers will also conduct an inspection of the Soyuz 16S spacecraft (behind thermal covers) in support of the on-going investigation of the Soyuz TMA-11/15S entry anomaly.

No CEO (Crew Earth Observation) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 9:46pm EDT [= epoch]):*
Mean altitude -- 339.6 km
Apogee height -- 343.4 km
Perigee height -- 335.9 km
Period -- 91.33 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005613
Solar Beta Angle -- -4.5 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 25 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54748

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

STS-124 Timeline

- *6/11 – FD12 - Undocking ~7:42am; Greg remains, Garrett leaves; OBSS survey/inspection*
- *6/12 – FD13 - Mostly off-duty*
- *6/13 – FD14 - Stowing; deorbit preps*
- *6/14 – FD15 - Deorbit burn*

06/14/08 -- STS-124/Discovery landing (KSC: ~11:02am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from FGB nadir)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)

11/03/08 -- Soyuz TMA-13/17S relocation
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/09/08
Date:	Monday, June 09, 2008 2:25:00 PM
Attachments:	

ISS On-Orbit Status 06/09/08

All ISS systems continue to function nominally, except those noted previously or below. *Flight Day 10 (FD10) of STS-124/1J. Underway: Week 8 of Increment 17.*

ISS crew work cycle shifted another 30 min. to the left: wake-up 5:02am EDT; sleep 8:02pm (Shuttle crew 30 min later: 8:32pm).

Crew activities aboard the ISS addressed five major areas: (1) IWIS Dedicated Thruster Firing, (2) JEM RMS Final Deployment, (3) R&R of two A/L BCMs (Airlock Battery Charger Modules), (4) JLP/JPM vestibule final outfitting plus JLP ingress, (5) crew media conference & photo.

For the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function), FE-2 Reisman collected a “wet” saliva sample before breakfast while FE-2-17 Chamitoff collected his first dry saliva samples, five times during the day. *[IMMUNE protocol requires the collection to occur first thing post-sleep, before eating, drinking and brushing teeth, and all samples are stored at ambient temperature. Along with NUTRITION (Nutritional Status Assessment), INTEGRATED IMMUNE samples & analyzes participant’s blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected at intervals during the collection day using a specialized book that contains filter paper. The liquid saliva collections require that the crewmember soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations.]*

In support of ISS science, CDR Volkov installed the geophysical GFI-1 Relaksatsiya ("relaxation") experiment from six GFI-1 hardware kits, reconfigured the payload

Laptop 3 for the experiment and mounted the UV (ultraviolet) camera with spectrometer unit (SP) at Service Module (SM) window #9. Purpose of the ~2.5hr experiment was to contribute to a hyperspectral space/time study of radiation patterns from the Earth atmosphere and surface from spectra recorded with the camcorder. The UV camera provided a base for the camcorder but was not activated. Afterwards the equipment was stowed again. *[Relaksatsiya normally deals with the study of the chemoluminescent chemical reactions and atmospheric light phenomena (emissions, i.e., molecular relaxation processes), including those that occur during high-velocity interaction between the exhaust products from space vehicles and the atmosphere at orbital altitude and during the entry of space vehicles into the Earth's upper atmosphere.]*

MS4 Hoshide, MS1 Nyberg & FE-2-17 Chamitoff completed final deployment of the JEM RMS (Japanese Experiment Module/Robotic Manipulator System) after connecting the drag-thru power cable and powering on the two RMS monitors and CCP (Camera Control Panel). *[Aki, Karen & Greg first maneuvered the RMS MA (Main Arm) to the final deploy position, then to the stowed position, checked out of the arm's brakes on SY (Shoulder yaw) joint, SP (Shoulder Pitch) joint, and EP (Elbow Pitch) joint, deactivated the RMS, and put the three HRMs (Hold & Release Mechanisms) on Hold.]*

Later, CDR Mark Kelly maneuvered the SRMS (Shuttle Remote Manipulator System) into the Discovery cargo bay to OBSS (Orbiter Boom Sensor Systems) Undock position.

In the Lab, Garrett Reisman set up the video camera to cover his subsequent placing of electrodes for a functional ECG (Electrocardiogram) checkout with a Holter Digital Recorder, as used for blood pressure studies. *[The ECG data, taken over a period of 5 minutes, were to be downlinked and analyzed by the experiment team and flight surgeon to support research on the blood-pressure medication Midodrine.]*

Reisman conducted the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week. The current cue card (17-0002J) lists 36 CWCs (~1456.4 L total) for the four types of water identified on board: technical water (693.8 L, for Elektron, flushing, hygiene, including 509.4 L non-usable water because of Wautersia bacteria), potable water (706.7 L, incl. 260.6 L currently on hold), condensate water (48 L), waste/EMU dump and other (7.9 L). Wautersia bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

The FE-2 also collected ITCS (Internal Thermal Control System) fluid samples from the COL (Columbus Orbital Laboratory) while coordinating with COL-CC/ Oberpfaffenhofen on proper valve settings.

Also in the COL, Garrett removed & replaced the DPSB-2 (Delta Pressure Sensor Block 2), installed at the COL1OF4 position in a stand-off.

Reisman and Chamitoff reviewed familiarization material on the correct procedures for DCB (Double Coldbag) packing scheduled for tomorrow. *[The DCB/Icepacs will be used for returning frozen samples to Earth as middeck cargo after their transfer from the MELFI (Minus-Eighty Laboratory Freezer for ISS) dewars.]*

Working in the Soyuz TMA-12/16S, Sergey Volkov removed the spacecraft's used ASU toilet collector and replaced it with an empty spare from Progress 29P. The dismantled collector was prepacked for disposal.

In the "Quest" A/L, Kelly & Fossum removed the two aged BCMs (Battery Charger Modules) and replaced them with new BCMs in slots 1 & 2. The R&R necessitated rotating the A/L Avionics Rack forward and later returning it to its upright position. *[The new BCMs, delivered on STS-124, were discovered to have a flawed LCD (Liquid Crystal Display) circuit board with a resistor which could overheat and thereby defeat the LED (Light-Emitting Diode) backlight capability of the new units. Kelly & Ham modified them on 6/6 by carefully opening up the BCMs (16 fasteners each), cutting the resistor leads and re-assembling the boxes. The BCMs are used to charge EMU batteries. The old BCMs had an increased toxicity level (Tox-4) due to their age, and the R&R today allows them to be returned on Discovery.]*

Hoshide & Nyberg finished up outfitting the JPM/JLP vestibule, installing remaining utility jumpers essential to JLP activation, i.e., for IMV (Intermodule Ventilation) and ARS (Atmosphere Revitalization System). Afterwards, Aki & Karen ingressed the JLP, configured the IMV air ducting and installed a PFE (Portable Fire Extinguisher) from JPM and a PBA (Portable Breathing Apparatus) from Node-2.

Later tonight, Aki & Mark Kelly will install four soft dummy panels in the Kibo JPM (at JLP1A2, JLP1P1, JLP1P2, JLP1F2) and Hoshide will take a documentary photo of a standoff (JPM1OF6). *[The latter was reported by the crew to lack Velcro for securing its soft dummy panel.]*

Kelly worked with Chamitoff on accessing OGS (Oxygen Generation System) hardware stowage by temporarily removing the OGS WDS (Water Delivery System), to retrieve a failed hydrogen sensor to be returned on 1J and transferred a number of OGS items from a Lab rack to the OGS stowage volume.

The SM thruster firing test for IWIS (Internal Wireless Instrumentation System) structural dynamics data taking was conducted thids morning at 6:22am-6:38am EDT, preceded by ISS attitude moded to free drift at 6:19am. *[At 6:38am, attitude control authority was handed over to RS MCS (Russian Segment Motion Control System) for maneuvering back to TEA (Torque Equilibrium Attitude), and attitude control returned to USOS momentum management at ~7:14am.]*

Later, after FE-1 Kononenko downloaded the IWIS data, CDR Volkov tore down the IWIS network for stowage, including removing the RSU (Remote Sensor Unit) in the Orbiter airlock and its cabling.

Oleg also conducted the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the passageways PrK (SM Transfer Compartment)–ATV, PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1. *[This checkup is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).]*

The FE-1 had an hour set aside on his schedule to look for a jumper cable which could not be located during the installation of VSPLESK ("Burst") science hardware on 5/27.

Later, Kononenko conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Oleg also completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The ISS crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-1, FE-2, FE-2-17), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR). Day 3 of CEVIS physical exercise for Greg Chamitoff.

Afterwards, Oleg & Greg copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM

storage medium (done six times a week).

Reisman, slated for return on the Discovery on 6/14, and Chamitoff, who replaces him as ISS FE-2, had another 1.5 hrs scheduled for standard joint handover activities.

Kelly & Ham spent several hours on cargo transfers from/to the Shuttle middeck. At ~4:32pm, Mark & Ken will have a transfer tagup with ground specialists. *[Transfers are on schedule. As of this morning, the crews were 84% complete on resupply transfers, 57% complete on return cargo, and 66% complete overall. The remaining transfers were divided into today & tomorrow.]*

At ~5:02pm, all ISS & Shuttle crewmembers will participate in the traditional joint TV news conference with US media at the NASA centers & Japanese media at JSC.

Afterwards, the crews have an additional 20 min. reserved to take the standard crew photo (foto ekipazha)

Note on no O_2 Transfer: Based on pre-flight agreements to conserve the lifetime-limited ORCA (Oxygen Recharge Compressor Assembly), not enough ullage (free volume) was created in the ISS high-pressure tanks to make an oxygen transfer from the Shuttle worthwhile. The operational cycles allowed under Flight Rule for the ORCA's diaphragm pump have already been modified by waiver from 280,000 to 373,000 cycles. A replacement ORCA will be delivered to KSC late this year.

Preview of tomorrow's main activities: Waste water dump from the Orbiter, installation of JEM RMS Backup drive system in JPM, PAO event, crew farewell & hatches closing, ODS leak check.

No CEO (Crew Earth Observation) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this noon, 12:24pm EDT [= epoch]):*
Mean altitude -- 339.7 km
Apogee height -- 343.5 km
Perigee height -- 335.8 km
Period -- 91.33 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005706

Solar Beta Angle -- -0.4 deg (magnitude leveling off)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 40 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54734

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

STS-124 docked timeline

- *6/10 – FD11 – "Sayonara" ~4:00pm, hatch close ~4:30pm*
- *6/11 – FD12 - Undocking ~7:33am; Greg remains, Garrett leaves; OBSS survey/inspection*
- *6/12 – FD13 - Mostly off-duty*
- *6/13 – FD14 - Stowing; deorbit preps*
- *6/14 – FD15 - Deorbit burn*

06/14/08 -- STS-124/Discovery landing (KSC: ~11:02am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from FGB nadir)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/03/08 -- Soyuz TMA-13/17S relocation
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/08/08
Date:	Sunday, June 08, 2008 4:47:25 PM
Attachments:	

ISS On-Orbit Status 06/08/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday -- Flight Day 9 (FD9) of STS-124/1J. Ahead: Week 8 of Increment 17.*

ISS crew work cycle shifted another 30 min. to the left: wake-up 5:32am EDT; sleep 8:32pm (Shuttle crew 30 min later: 9:02pm).

Crew activities aboard the ISS centered on three major areas: (1) Spacewalk #3 (EVA-3), (2) more JLP (JEM Logistics Pressurized Module) outfitting, and (3) sample collections from Kibo air & surfaces plus Node-2 ITCS coolant.

Mission 1J's EVA-3 was completed successfully by Mike Fossum & Ron Garan in 6h 33min, accomplishing all its objectives.
[During the spacewalk, Fossum (EV1) & Garan (EV2) –

(1) Removed the old NTA (Nitrogen Tank Assembly) at S1 truss,
(2) Retrieved the new NTA from ESP-3 (External Stowage Platform 3),
(3) Installed new NTA on S1, stowed the old NTA & connected NTA FQD (Fluid Quick Disconnect) jumper,
(4) Collected two debris samples (not grease) at Port SARJ, using Kapton tape,
(5) Re-installed the ETVCG (External TV Camera Group) camera, reworked with new power supply, at CP9 (Camera Port 9) on the left truss,
(6) Removed thermal covers & launch locks from JEMRMS WVE/EVE (Wrist & Elbow Vision Equipment) cameras,
(7) Removed JPM aft window launch locks,
(8) Deployed fwd & aft MMOD (Micrometeoroid/Orbital Debris) shields on ACBM (Active Common Berthing Mechanism), and
(9) Inspected & tightened a loose bolt on the fwd JTVE camera boom's JPM mounting which "wobbled" yesterday while panning & tilting (late-added get-ahead task).

Official start time of the spacewalk was 9:55am EDT, about 37 minutes ahead of timeline, and it ended at 4:28pm. Total EVA duration (PET = Phase Elapsed Time) was 6h 33min.]

After wakeup at ~5:32am, ending the 8.5-hr sleep period before the spacewalk, the A/L CL (Airlock Crewlock) hatch was cracked (~6:57am) for a hygiene break/with mask prebreathe for Fossum & Garan, after spending the night on 10.2 psi campout. Around 7:22am, the hatch was closed again by IVs (Intravehicular Crewmembers) for EVA preparations in 10.2 psi, followed by EMU (Extravehicular Mobility Unit) purge & prebreathe. Sergey Volkov, Mark Kelly & Greg Chamitoff assisted the spacewalkers during EMU purge, EMU prebreathe and CL depressurization. EV1/EV2 egress followed after the EMUs were switched to batteries at 9:55am.

Prior to EVA start, CDR Volkov checked two Kodak DCS760 digital cameras with 28mm lens for the EVA (one with flash for the SARJ task) and verified deactivation of all onboard ham radio equipment (Kenwood in SM/Service Module, Ericsson in FGB) to prevent RF interference with the EMUs, as well as proper closure of the protective Lab window shutters.

Volkov serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out" cycle to vacuum on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~7:50pm EDT. Filter bed #1 was regenerated yesterday. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle is regularly done every 20 days.]*

As part of regular preventive maintenance of RS (Russian Segment) ventilation systems, Sergey replaced the four dust filters (PF1-4) in the SM.

Preventive maintenance was also performed by FE-1 Oleg Kononenko in the Soyuz TMA-12/16S at the DC1 nadir port, cleaning the screen of the BVN fan/heater assembly in the Orbital Module (BO).

FE-2 Reisman worked on the ITCS (Internal Thermal Control System) in Node-2, using the new 1J-delivered CQMK (Coolant Quality Monitoring Kit) to collect return-to-ground fluid samples from the LTL (Low Temperature Loop) and MTL (Moderate Temperature Loop) sample ports after flushing (ammonia or OPA/Ortho-Phthalaldehyde test samples not required).

Later, Garrett floated into the Kibo laboratory and used the MAS (Microbial Air Sampler) kit to obtain microbiology air samples from mid-module, and the SSK (Surface Sample Kit) to collect/incubate microbiology samples from two prime

surface sites for return to ground.

Sergey unstowed the two Russian pilot sighting instruments VP-2 & “Puma” and installed them at SM window #8 for functional testing. *[The Puma Portable Zoom Viewfinder is used to view remote objects and determine their angular position in the SM coordinate system in order to provide geographical reference of observed terrestrial objects, and to determine the target vector in a specified coordinate system. The 240K Pilot Sight (VP-2) is a collimator-type device for determining the direction to observed reference points relative to the station coordinate for geographical reference of observed terrestrial objects and to determine the direction vector to controlled & uncontrolled objects and measure their angular sizes.]*

Oleg Kononenko conducted the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the passageways PrK (SM Transfer Compartment)–ATV, PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1. *[This checkup is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).]*

Kononenko also continued the current work with the Russian KPT-2 science payload BAR-RM, Kelvin, Ira and TTM from the RSE1 laptop, started by Oleg last Friday. *[Measurements are being taken in the RS, behind panels, near welds along SM structural rings and near the shell ring in the FGB for subsequent downlinking via BSR-TM channel. At the FGB pressurized shell ring, the cosmonauts were to inspect structural elements, equipment, and cable bundles for moisture, mold, or evidence of corrosion. The data, collected at locations such as feedthroughs, windows, hatches etc., are being used to get proficient in experimenting with ISS leak detection based on environmental data anomalies (temperature, humidity, and ultrasound emissions) at potential leak locations. The BAR-RM payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/thermometer (TTM-2), an ultrasound analyzer (AU-01), and a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station. Measurements are taken in specific zones (13 in SM PkhO and 4 in DC1), both with lights, fans & ASU pump turned on and off.]*

For hardware familiarization/handover, Sergey Volkov & Greg Chamitoff inspected and checked out the HMS RSP (Health Maintenance System/Respiratory Support Pack).

FE-2 Reisman performed calibration on the new CSA-O_2 (CSA -Oxygen sensor) units #1043 & #1059 delivered on 1J. The old CSA-O_2 instruments (#1041 & #1052) were packed for return to Earth.

Garrett, slated for return on the Discovery on 6/14, and MS5 Greg Chamitoff, who replaces him as ISS FE-2, had about 3.5 hrs scheduled for standard joint handover activities, to be continued through the docked period ahead.

MS1 Karen Nyberg & MS4 Aki Hoshide first operated the SSRMS (Space Station Remote Manipulator System) to “fly” & support Ron Garan during the S1 NTA remove/install, then moved to the JLP container module to conduct Part 1B outfitting by removing CBM (Common Berthing Mechanism) hardware, e.g. CPAs (Controller Panel Assemblies), and installing avionics jumpers.

The FE-1 conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

The CDR completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Aki & Karen spent several hours on cargo transfers from & to the Shuttle middeck.

The ISS crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-1, FE-2, FE-2-17), and TVIS treadmill (CDR, FE-1), RED resistive exercise device (FE-2). Day 2 of CEVS physical exercise for Greg Chamitoff.

Afterwards, Sergey copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Preview of tomorrow’s main activities: SM & ATV thruster firings for IWIS, crew conference & photo, JEM RMS final deployment, installation of two new BMCs (Battery Charger Modules) in rotated Airlock Avionics Rack (A/L1F1), JLP outfitting part 2 & ingress.

No CEO (Crew Earth Observation) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:18am EDT [= epoch]):*
Mean altitude -- 339.7 km
Apogee height -- 343.4 km
Perigee height -- 336.0 km
Period -- 91.33 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005524
Solar Beta Angle -- 3.8 deg (magnitude decreasing, leveling off tomorrow)
Orbits per 24-hr. day -- 15.77
Mean altitude gain in the last 24 hours -- 70 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54714

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

STS-124 docked timeline

- *6/09 – FD10 - JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R, DTF (Dedicated Thruster Firing)*
- *6/10 – FD11 – "Sayonara" ~4:00pm, hatch close ~4:30pm*
- *6/11 – FD12 - Undocking ~7:33am; Greg remains, Garrett leaves; OBSS survey/inspection*
- *6/12 – FD13 - Mostly off-duty*
- *6/13 – FD14 - Stowing; deorbit preps*
- *6/14 – FD15 - Deorbit burn*

06/14/08 -- STS-124/Discovery landing (KSC: ~11:02am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from FGB nadir)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (DC1 nadir)
11/03/08 -- Soyuz TMA-13/17S relocation

11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/07/08
Date:	Saturday, June 07, 2008 3:32:20 PM
Attachments:	

ISS On-Orbit Status 06/07/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday -- Flight Day 8 (FD8) of STS-124/1J.*
ISS crew work cycle shifted another 30 min to the left: wake-up 6:02am EDT; sleep 9:02pm (Shuttle crew 30 min later: 9:32pm).

Crew activities aboard the ISS centered on three major areas: (1) Initial deployment of JEM RMS (Japanese Experiment Module Robotic Manipulator System) activation & checkout, (2) JLP (JEM Logistics Pressurized Module) post-relocation outfitting (Part 1), (3) Preparations for EVA-3 & EV1/EV2 Campout.

Before breakfast, FE-2 Reisman & FE-2-17 Chamitoff collected a “wet” saliva sample (the third for Greg) for the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function). *[IMMUNE protocol requires the collection to occur first thing post-sleep, before eating, drinking and brushing teeth, and all samples are stored at ambient temperature. Along with NUTRITION (Nutritional Status Assessment), INTEGRATED IMMUNE samples & analyzes participant’s blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected at intervals during the collection day using a specialized book that contains filter paper. The liquid saliva collections require that the crewmember soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations.]*

CDR Volkov conducted the periodic service of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The regen process will be terminated before sleeptime, at ~7:32m EDT. Regeneration of bed

#2 follows tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle is regularly done every 20 days.]*

Garrett Reisman, in charge of the JLP fine leak check, determined that a valve for the overnight procedure was incorrectly set. A repeat of the hermeticity check is being scheduled after Shuttle departure. *[This is not a problem for ingress into JLP (on FD10), but for long term operations.]*

FE-1 Kononenko conducted the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the passageways PrK (SM Transfer Compartment)–ATV, PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1. *[This checkup is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).]*

Volkov and later Kononenko spent several hours continuing their current work with the Russian KPT-2 science payload BAR-RM, Kelvin, Ira and TTM from the RSE1 laptop, started by Oleg yesterday. *[Measurements are being taken in the RS, behind panels, near welds along SM structural rings and near the shell ring in the FGB for subsequent downlinking via BSR-TM channel. At the FGB pressurized shell ring, the cosmonauts were to inspect structural elements, equipment, and cable bundles for moisture, mold, or evidence of corrosion. The data, collected at locations such as feedthroughs, windows, hatches etc., are being used to get proficient in experimenting with ISS leak detection based on environmental data anomalies (temperature, humidity, and ultrasound emissions) at potential leak locations. The BAR-RM payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/thermometer (TTM-2), an ultrasound analyzer (AU-01), and a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station. Measurements are taken in specific zones (13 in SM PkhO and 4 in DC1), both with lights, fans & ASU pump turned on and off.]*

In the FGB, Kononenko removed three IPK-1M gas masks, intended for fire suppression, and replaced them with new units. *[The masks were removed along with their holding brackets on panels 230, 404 and overhead in the GA (Pressurized Adapter). The new masks were installed on Velcro in the area of the old ones.]*

The FE-2 performed the regular monthly & quarterly maintenance of the TVIS (Treadmill with Vibration Isolation & Stabilization), inspecting the condition of harnesses, belt slats, corner bracket ropes, IRBAs (Isolation Restorative Bungee

Assemblies) and gyroscope wire ropes for any damage or defects, lubricating as required plus recording time & date values.

For MS4 Aki Hoshide, today's activities with Kibo's own RMS (Robotic Manipulator System) began right after his wake-up and post-sleep period (~9:00am EDT), proceeding along the following steps:

- *Powering up RMS Monitors 1 & 2 and CCP (Camera Control Panel) by connecting to drag-thru power cable from Node-2,*
- *Checking Joint Limit Database and powering on the Ext-2 jumper to supply electricity to RMS motor mechanisms,*
- *Initiating (later terminating) warm-up on the #3 RMS HRM (Hold & Release Mechanism),*
- *Release HRM,*
- *Initial deploying of RMS, with minimal checkout of the WP (wrist pitch), then moving clear of the HRM, to allow EVA-3 spacewalkers to remove MA TVC MLIs (Main Arm/Television Camera/Multi-Layer Insulation) and LLs (Launch Locks),*
- *Deactivating the RMS Monitors 1 & 2 and CCP for saving power resources, and*
- *Disconnecting the drag-thru power cable.*

MS1 Karen Nyberg maneuvered the SRMS (Shuttle Remote Manipulator System) to EVA-3 viewing position and later also the SSRMS (Space Station RMS) to EVA-3 egress start configuration.

Later today, JLP vestibule outfitting, Part 1, by Karen Nyberg and Aki Hoshide is involving removal of thermal covers and installation of power jumpers for JLP warm-up.

In the Lab (LAB105), Karen removed the AmiA (Antimicrobial Applicator), brought up on STS-124, from the ITCS (Internal Thermal Control System). *[AmiA was used to introduce OPA (Ortho-Phthalaldehyde), an antimicrobial agent, into the Lab ITCS coolant. Later a sample of the fluid will be taken and returned for analysis.]*

FE-2 Reisman filled out the regular FFQ (Food Frequency Questionnaire), his 11th, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The*

FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]

Mark Kelly & Ken Ham again are spending several hours on cargo transfers from & to the Shuttle middeck. *[As of last night, 52% of transfers were complete.]*

The CDR conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Volkov also gathered weekly data on Total Operating Time & “On” durations of the Russian POTOK-150MK (150 micron) air filter unit of the SM’s SOGS air revitalization subsystem for reporting to TsUP.

Later, Sergey completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Garrett, slated for return on the Discovery on 6/14, and MS5 Greg Chamitoff, who is to replace him as ISS FE-2, had about 5 hrs scheduled for standard joint handover activities, to be continued through the docked period ahead.

The CDR conducted his third run with the Russian DZZ-2 "Diatomeya" ocean observations program, using the HDV (high-definition) video camcorder from SM windows 8 for ~30 min to record bioluminescent glow of high production zones in the South China Sea, the straits of Indonesia and the Gulf of Carpenteria (in Australia’s north).

Sergey also had ~15 min set aside for another Russian "Uragan" (hurricane) earth-imaging session, using the Nikon D2X digital camera with 300-800 mm telephoto lens from SM window 9 and the RSK1 laptop for picture download. *[Targets uplinked for today were the Alps, the Allaline Glacier, general views of the Carpathian mountains, forests of Central Russia Ugra National Park, water release through the Volgograd hydropower plant, and general views of the Southern Urals.]*

The ISS crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2, FE-2-17), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-1) and VELO cycle with bungee cord load trainer (FE-1). Physical exercise regimen for Greg Chamitoff began today on the CEVIS.

Afterwards, Oleg & Greg copied the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Fossum, Garan, Kelly, Ham, Volkov and Chamitoff conducted a one-hour review of timeline & procedures for tomorrow's EVA-3 by Mike Fossum (EV1) & Ron Garan (EV2).

Later, at ~5:30pm, after completing Airlock Equipment Lock (A/L EL) configuration for EVA-3, including recharging batteries, configuring two DCS760 cameras (one with flash for the port SARJ task) and checking EMU equipment, Mike & Ron will begin their "campout" in the "Quest" A/L, starting mask prebreathe, while configuring EVA tools, at ~7:57pm, then closing hatches and initiating depressurization of the CL (Crewlock) from 14.7 to 10.2 psi. Sleep for them and the ISS crew will commence at ~9:32pm, for the Shuttle crew at ~10:02pm. *[The overnight Campout in the A/L CL for denitrogenation/pre-breathe at 10.2 psi lasts about 8.5 hrs. First, the two spacewalkers will perform PBA (Portable Breathing Apparatus) mask prebreathe for denitrogenation, while readying their tools & equipment, then depress the CL from 14.7 to 10.2 psi for their sleep period, to last until ~5:32am EDT tomorrow. The CL hatch will then be cracked at ~6:12am (i.e., temporarily repressurized) for a hygiene break/with mask prebreathe for Fossum & Garan. Around 7:22am, the hatch will be closed again for EVA preps in 10.2 psi, followed by EMU purge & prebreathe. Afterwards, Mark Kelly will support CL depressurization from the EL until space egress.]*

EVA-3, beginning tomorrow nominally at ~10:32am EDT (likely earlier), will last an estimated 6h 30min, i.e., ending at 5:02pm. PLT Ken Ham will again be IV (Intravehicular) crewmember.

--- *EVA-3 main objectives are to:*

- *Remove old NTA (Nitrogen Tank Assembly) at S1 truss,*
- *Retrieve spare NTA from ESP-3 (External Stowage Platform 3),*
- *Install new NTA on S1 truss & stow old NTA,*
- *Connect NTA FQD (Fluid Quick Disconnect) jumper,*
- *Re-install reworked (with new power supply) ETVCG (External TV Camera Group) camera at CP9 (Camera Port 9) on the left truss,*

- *Remove thermal covers & launch locks from JEMRMS WVE/EVE (Wrist/Elbow Vision Equipment),*
- *Remove JPM aft window launch locks,*
- *Deploy fwd & aft MMOD (Micrometeoroid/Orbital Debris) shields on ACBM (Active Common Berthing Mechanism), and*
- *Collect debris samples at Port SARJ (as a get-ahead).*

Waste Water Dump: At ~9:15am, PLT Ham conducted the periodic waste water dump from the Orbiter, the fourth since mission start. Two more water ventings are scheduled. *[The water vent involved the waste water tank, 5 PWRs (Payload Water Reservoirs), and 2 CWCs (Contingency Water Containers). For the venting, the ISS/Shuttle stack was maneuvered from the current TEA (Torque Equilibrium Attitude) to the proper attitude (nozzles facing retrograde) and returned later to TEA.]*

Port SARJ Update: Ground specialists believe the possible source of the grease-like substance observed by Fossum & Garan during EVA-2 in the portside Solar Alpha Joint is Braycote-601, a lubricant used in space, from the trundle bearings. Similar indications can be seen in imagery from the inspections performed during Mission 10A. A get-ahead task was added to tomorrow's EVA-3 to collect samples from the SARJ from debris on a tang, a second site for debris, debris mixed with grease, and the purest sample of the grease-like matter.

At ~2:07pm EDT, the STS-124 flight crew participated in three live interactive PAO TV interviews with CNN (Miles O'Brien), WCBS-TV (Erminia Vacirca), New York, NY, and WDAY-TV (Kevin Wallevand), Fargo ND.

Tonight at ~7:02pm (8:02am, 6/8, in Tokyo), the crew, Aki Hoshide & Mark Kelly, representing the crew, will receive a VIP call from Japanese Prime Minister Yasuo Fukuda, joined by Minister of Education, Culture, Sports, Science and Technology Kisaburo Tokai, Miraikan-Director and former Astronaut Dr. Mamoru Mohri, the U.S. Ambassador in Japan J. Thomas Shieffer, plus two primary school students, and two junior high school students, all located at the Miraikan (National Museum of Emerging Science and Innovation) in Tokyo.

Weekly Science Update *(Expedition Seventeen -- Week 7)*

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Measurements continue in FGB module.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): In progress.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): The experiment platform continues to operate nominally. Its power feeder #1 has been de-activated to support the JEM install activities (EVA-2). The graceful shutdown of the platform was commanded some hours ahead of schedule, due to instabilities of the Ground Segment at COL-CC. After the EVA-2, the EuTEF instruments have then been re-activated nominally. A DHPU (Data Handling Processing Unit) software patch is currently developed to fix the link error issues encountered with DEBIE-2 and FIPEX instruments. - DEBIE-2: Link error still under investigation;- DOSTEL: On-going science acquisition; - EuTEMP: Currently inactive as planned; - EVC: Inactive, high rate data downlink needs further troubleshooting; - EXPOSE: On-going science acquisition; - FIPEX: A new script has been started after the re-activation of the EuTEF platform, now acquiring science; - MEDET: Acquiring science since 6/5; - PLEGPAY: Several measurements have been performed with the Langmuir probe instrument during the STS-124 (1J) docking manoeuvre. The instrument is now powered on, but not in science acquisition mode; - TRIBOLAB: The Pin On Disk run #3 (POD#3) has been nominally completed on 5/31. The

instrument has been put in Thermal Stabilisation Mode after EuTEF power feeder #1 re-activation.

FSL (Fluid Science Laboratory): FSL MIL Bus cable repair was successfully performed on 5/5. After FSL Rack Activation from ground on 5/8, the ground confirmed that the FSL cables repair activities were successful. Further troubleshooting activities will be required with CEM-U (Upper) Optical Module.

GEOFLOW: Further troubleshooting activities with CEM-U(pper) Optical Module are required. A new lamp was sent up on STS-124 (1J). The start of GEOFLOW is pending further FSL troubleshooting and remaining commissioning activities (check of FSL optical modes) and it will not occur prior to the end of the 1J flight.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Complete.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION w/REPOSITORY: Complete.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Inc16 samples have been downloaded with 15S and handed over to science team.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): "Garrett, your only remaining activity will be to doff your Actiwatch on the Shuttle with the other two participating crewmembers. Any additional Sleep Logging on the SSC while on ISS is above and beyond and greatly appreciated by the PI. No Sleep logging is required while you are on the Shuttle." "Greg, you have completed your first Sleep Activity by donning the Actiwatch. You will have five download/ initialization sessions and three weeks of Sleep logging remaining for your Increment 17 activities. Any additional sleep logging into the SSC will be above and beyond and greatly appreciated by the PI."

SOLAR (Solar Monitoring Observatory): A new Sun observation period started on 6/03. Since then, the SOLAR measurements have been impacted by the ISS Attitude change and the STS-124 (1J) docking approach. Moreover, we have faced severe Telemetry and Telecommanding problems at COL-CC, leading to the postponement of science acquisition and of SOLAR criss-cross manoeuvres execution over the last days. SOLAR has been gracefully shutdown by the crew on 6/4. It was the only feasible and quick solution to safe SOVIM prior to thruster firings of the Orbiter. After the JEM activation, SOLAR power feeder #1 has been reactivated, and we are now acquiring science nominally. On 6/6, we plan to execute some criss-cross manoeuvres. - SOVIM: Acquiring science; - SOLSPEC: Acquiring science; - SOLACES: Acquiring science.

SOLO: Planned.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

3-D SPACE : A crew conference is currently planned on 6/12. First session with Greg Chamitoff is currently planned for 6/13.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): The four ECs (Experiment Containers) of Rotor B are yet to be retrieved by the crew from the blocked Rotor B. BLB (BIOLAB) could not be activated from ground yet,

pending resolution of the Smoke Detector issue. After the 1J Flight, the remaining WAICO-#1 ECs will be disposed and replaced by six Reference ECs on Rotor B.

CEO (Crew Earth Observations): Ongoing.

No CEO (Crew Earth Observation) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:12am EDT [= epoch]):*
Mean altitude -- 339.6 km
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Perigee height -- 336.0 km
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Eccentricity -- 0.000549
Solar Beta Angle -- 8.1 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 80 m
/Revolutions since FGB/Zarya launch (Nov. 98) -- 54699

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

STS-124 docked timeline

- *6/08 – FD9 - EVA-3 (10:32am, 7 hrs), S1 NTA R&R, compl JPM outfit (RMS cvr remv), P1 CP9 ETVCG install*
- *6/09 – FD10 - JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R, DTF*
- *6/10 – FD11 – "Sayonara" (~4:00pm), hatch close (~4:30pm)*
- *6/11 – FD12 - Undocking (~7:33am); Greg remains, Garrett leaves; OBSS survey/inspection*
- *6/12 – FD13 - Mostly off-duty*
- *6/13 – FD14 - Stowing; deorbit preps*
- *6/14 – FD15 - Deorbit burn*

06/14/08 -- STS-124/Discovery landing (KSC: ~11:02am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (at DC1 nadir)
10/01/08 -- **NASA 50 Years**

10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
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12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/06/08
Date:	Friday, June 06, 2008 5:03:27 PM
Attachments:	

ISS On-Orbit Status 06/06/08

All ISS systems continue to function nominally, except those noted previously or below. *Flight Day 7 (FD7) of STS-124/1J. ISS crew work cycle shift begins with an earlier sleeptime: wake 6:32am EDT; sleep 9:32pm (Shuttle crew remaining at 10:02pm).*

Crew activities aboard the ISS today centered on three major areas: (1) JLP (JEM Logistics Pressurized Module) relocation, (2) JPM (Japanese Pressurized Module) Kibo outfitting, and (3) start of JEM RMS (Robotic Manipulator System) activation & checkout.

JLP was successfully installed at its final location on the Kibo JPM at 4:04pm EDT. *[After JLP/Node-2 vestibule demating and depressurization, MS1 Nyberg and FE-2-17 Chamitoff used the SSRMS (Space Station Remote Manipulator System) to grapple, unberth, transfer and reberth the JLP on Kibo's overhead port (1st stage capture 3:54pm, SSRMS wrist limped 3:58pm, 2nd stage capture with all 16 bolts 4:04pm). Karen, Greg & Aki Hoshide then latched the JPM overhead hatch via ratchet & crank handle, pressurized the connecting vestibule partially and initiated the standard vestibule gross leak check, later configuring the gear for the usual overnight fine leak check. After the installation, ISS attitude was maneuvered to the new TEA (Torque Equilibrium Attitude) which the addition of the JLP has changed. JLP was delivered on orbit by STS-123/Endeavour and docked at the Node-2 zenith port on 3/14.]*

In support of the JLP transfer & berthing –

- CDR Volkov connected the accelerometer in the Shuttle airlock to the IWIS RSU (Internal Wireless Integrated System/Remote Sensor Unit) and programmed/activated the system for taking structural dynamics data during the JLP relocation. *[IWIS RSUs are currently deployed in the SM (Service Module), FGB, Node-1, Lab, Node-2 and Discovery. IWIS will also collect data during the upcoming DTF (Dedicated Thruster Firing) on FD10 (6/9)],*

- FE-2 Reisman powered up the CBCS (Centerline Berthing Camera System) which he installed yesterday at the JPM hatch, then worked with MS4 Akihiko Hoshide to configure and depressurize the JLP/Node-2 vestibule for demating,
- Aki supported the demating of the Node-2 zenith CBM (Common Berthing Mechanism), petals to be closed at a later time,
- CDR Mark Kelly provided camera support during the relocation,
- Hoshide removed the sample port cap from the PPRV (Positive Pressure Relief Valve) in the JPM overhead hatch,
- Nyberg then detached the PPRV from the JPM hatch, now no longer required, and replaced it with an MPEV (Manual Pressure Equalization Valve), and
- Reisman deactivated and dismantled the no longer needed CBCS.

After yesterday's outfitting, the SSIPC (Space Station Integrated Promotion Center) activated the JPM Power Channel A last night. The activation was nominal and now both channels, A & B, are functional.

Continuing Kibo laboratory outfitting activities today –

- Karen Nyberg & Greg Chamitoff rotated the ECLSS/TCS2 (Thermal Control System 2) rack down to close the manual inlet valve of the ATCS TCA (Active TCS Thermal Control Assembly) accumulator, then moved the rack back up, and
    - Mark Kelly & Ken Ham worked on the DMS2 (Data Management Systems 2), EPS2 (Electrical Power Systems 2) and TCS1 (Thermal Control System 1) racks in the JPM, reconfiguring each with a pivot pin and K-BAR (Knee-Brace Assembly Replacement) capture mechanism.

FE-1 Kononenko set up new Bubble dosimeters for recording radiation traces as an additional component of the RS (Russian Segment) radiation payload suite "Matryoshka-R" (RBO-3-2), initializing and deploying the detectors. Proper function of the setup was later verified with the LULIN-5 electronics box. *[A total of seven Bubble dosimeter detectors (A01-A08, A05 not used) were initialized in the Bubble dosimeter reader in the SM and positioned at their exposure locations, three at the spherical "Phantom" unit on the DC1 panel and four in the SM starboard crew cabin on both sides of the MOSFET (metal oxide semiconductor field-effect transistor) dosimeter detector unit. The setup was photo-documented with the NIKON D2X camera and also reported to TsUP via log sheet on the BSR-TM payload channel. The complex Matryoshka payload suite is designed for sophisticated radiation studies. Note: Matryoshka is the name for the traditional Russian set of nested dolls.]*

CDR Mark Kelly & PLT Ken Ham had 2.5 hrs reserved for reworking two new A/L

BCMs (Airlock Battery Charge Modules) before their installation in lieu of failed units. The BCMs will be installed in slots 1 & 2 in the A/L on FD10. *[The BCMs, delivered on STS-124, were discovered to have a flawed LCD (Liquid Crystal Display) circuit board with a resistor which could overheat and thereby defeat the LED (Light-Emitting Diode) backlight capability of the new units. The modification consisted in carefully opening up the BCMs (16 fasteners each), cutting the leads of the resistor and re-assembling the boxes.]*

MS4 Hoshide swapped the onboard voltage/current MultiMeter with a new unit.

Garrett Reisman retrieved the RFCA FSE (Rack Flow Control Assembly/Flight Support Equipment) accumulator which on 6/4 was removed in the JPM from the LTL (Thermal Control System/Low Temperature Loop) of the TCS/EPS1 rack, installed it on the failed RFCA from Node-2 (removed 5/28) and transferred both to the Orbiter for return.

In the SM, Sergey Volkov completed the IMF (Inflight Maintenance) on the two Russian SKV air conditioners started yesterday, installing six new retainers and restoring the nominal mounting structures for the SKVs' heat exchanger-condenser fans VTK1 & VTK2. *[The outfitting involved temporary deactivation of a SIGNAL-VM (DS-7A) smoke detector (#2), removing & reinstalling panels, and dismantling the old ventilator mounts for relegation to trash.]*

Using the RSE1 laptop, FE-1 Kononenko spent 3.5 hrs with the new KPT-2 science payload BAR-RM, Kelvin, Ira and TTM, set up 6/4-5 for battery charging, today running tests and taking the first measurements (temperatures, relative humidity, dew point temperatures), using the RSE1 laptop. *[Measurements were taken behind panels, near welds along SM structural rings and near the shell ring in the FGB for subsequent downlinking via BSR-TM channel. At the FGB pressurized shell ring, Oleg also inspected structural elements, equipment, and cable bundles for moisture, mold, or evidence of corrosion. The data, collected at locations such as feedthroughs, windows, hatches etc., are being used to get proficient in experimenting with ISS leak detection based on environmental data anomalies (temperature, humidity, and ultrasound emissions) at potential leak locations. The BAR-RM payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/thermometer (TTM-2), an ultrasound analyzer (AU-01), and a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station. Measurements are taken in specific zones (13 in SM PkhO and 4 in DC1), both with lights, fans & ASU pump turned on and off.]*

CDR Volkov conducted his second recharging of the Motorola Iridium-9505A satellite phone brought up on Soyuz 16S, a monthly routine job. *[After retrieving it from its location in the TMA-12/16S descent module (BO), Sergey initiated the recharging of its lithium-ion battery, monitoring the process every 10-15 minutes as it took place. Upon completion at ~11:15am, the phone was returned inside its SSSP Iridium kit and stowed back in the BO's operational data files (ODF) container. The satphone accompanies returning ISS crews on Soyuz reentry & landing for contingency communications with SAR (Search-and-Rescue) personnel after touchdown (e.g., after an "undershoot" ballistic reentry, as happened during the recent 15S return). The Russian-developed procedure for the monthly recharging has been approved jointly by safety officials. During the procedure, the phone is left in its fire-protective fluoroplastic bag with open flap. The Iridium 9505A satphone uses the Iridium constellation of low-Earth orbit satellites to relay the landed Soyuz capsule's GPS (Global Positioning System) coordinates to helicopter-borne recovery crews. The older Iridium-9505 phones were first put onboard Soyuz in August 2003. The newer 9505A phone, currently in use, delivers 30 hours of standby time and three hours of talk, up from 20 and two hours, respectively, on the older units.]*

The CDR also conducted his second run with the Russian DZZ-2 "Diatomeya" ocean observations program, using the NIKON F-5 digital still camera with 80-200 mm lens and the HDV (high-definition) video camcorder from SM windows 7 & 8 to record color fields in oceanic waters attributed to phytoplankton blooming and observation conditions along the flight path. *[June is a period of extensive phytoplankton blooming in the waters of the Northern hemisphere and is also associated with the end of a dry season and the start of a rainy season in the largest river basins of India, West Africa, and South America. Uplinked target zones were along the Honduras coastline.]*

The FE-1 conducted the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the passageways PrK (SM Transfer Compartment)–ATV, PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1. *[This checkup is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).]*

Later, Kononenko completed the periodic (about twice a month) replenishing of the Elektron oxygen generator's water supply for electrolysis, filling the KOV EDV container with water collected in CWCs (Contingency Water Containers) #1075 & #1043 from the Lab CCAA (Common Cabin Air Assembly) dehumidifier. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron shutdown.]*

FE-2 Reisman performed periodic 40-min. maintenance on the U.S. OGS (Oxygen Generation System), recharging the WDS (Water Delivery System) from a filled PWR (Payload Water Reservoir), leaving the PWR stowed in front of it. *[Like the Russian Elektron, OGS produces O_2 from water by electrolysis, dumping the also generated H_2 (hydrogen) through venting.]*

In the SM, Oleg completed the routine maintenance of the SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Sergey also handled the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Shuttle crewmembers Kelly & Ham had several hours set aside for working on transfers of cargo from and to the Discovery middeck, “choreographed” by an uplinked detailed transfer list.

With the SSRMS parked by Karen & Greg at the JEMRMS viewing position, Aki Hoshide will perform steps later tonight for relieving any mechanical strain from the Japanese RMS main arm. *[This consists of turning on the arm’s RTL (Robotic Laptop Terminal) and CCP (Camera Control Panel), then resetting JEU (Joint Expedited Undocking) resolvers and powering on the Ext-2 power line which provides electricity to the RMS motor mechanisms.]*

Afterwards, Aki will use the laptop for checking out the arm’s MUX (Data Multiplexer) and its THC (Translational Hand Controller) in the x-axis (for single-joint ops), in a partial deploy to the EVA-3 start position, and for checking out the performance of the video systems.

Earlier today, Greg Chamitoff terminated the GN_2 (gaseous nitrogen) transfer from the Shuttle to the HPT (high-pressure tank) on the “Quest” A/L by closing the manual isolation valve. Total N_2 transferred: ~14 lbs.

The FE-2-17 again had about an hour for himself for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for

the first two weeks after starting station residence.

The ISS crew performed physical workout on the TVIS treadmill (CDR, FE-2) and RED resistive exercise device (FE-1).

Afterwards, Oleg copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~9:51am EDT, Oleg & Sergei powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, and power supply) and at 9:56am conducted a ham radio exchange with students at the Kursk State Polytechnic University in Kursk, central Russia.

At 12:27pm, the two Commanders, Sergey Volkov & Mark Kelly, participated in three live interactive PAO TV interviews with KMSB-TV in Tucson, AZ (Deanna Morgan), NPR (National Public Radio, Scott Simon), and APTV (Associated Press Television, Marcia Dunn).

Port SARJ Inspection Update: As a get-ahead task during yesterday's EVA-2, Fossum and Garan spent some time on the port Solar Alpha Rotary Joint, removing cover #2, inspecting the bearing surface and replacing the cover. Photos were taken and downlinked for review. The crew reported that there are no metal shavings visible in the area nor is there visible bearing damage as was discovered in the starboard SARJ bearing. No divots were seen on the bearing surface. A grease-like substance appears to be smeared on Datum A, circumferentially distributed about 1/2" from the edge, but this is not currently considered to be detrimental to the operation of the SARJ. The origin of this substance is under investigation. The port SARJ was last inspected during the Expedition 16 Stage EVA.

No CEO (Crew Earth Observation) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:10am EDT [= epoch]):*
Mean altitude -- 339.7 km
Apogee height -- 343.5 km
Perigee height -- 335.9 km
Period -- 91.33 min.

Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.000563
Solar Beta Angle -- 12.deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude gain in the last 24 hours -- 35 m
/Revolutions since FGB/Zarya launch (Nov. 98) -- 54684

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

STS-124 docked timeline

- *6/07 – FD8 - JLP Vestibule outfitting; CP9 ETVCG TVCIC R&R, Campout*
- *6/08 – FD9 - EVA-3 (10:32am, 7 hrs), S1 NTA R&R, compl JPM outfit (RMS cvr remv), P1 CP9 ETVCG install*
- *6/09 – FD10 - JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R, DTF*
- *6/10 – FD11 – "Sayonara" (~4:00pm), hatch close (~4:30pm)*
- *6/11 – FD12 - Undocking (~7:33am); Greg remains, Garrett leaves; OBSS survey/inspection*
- *6/12 – FD13 - Mostly off-duty*
- *6/13 – FD14 - Stowing; deorbit preps*
- *6/14 – FD15 - Deorbit burn*

06/14/08 -- STS-124/Discovery landing (KSC: ~11:02am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (at DC1 nadir)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking

2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/05/08
Date:	Thursday, June 05, 2008 6:28:28 PM
Attachments:	

ISS On-Orbit Status 06/05/08

All ISS systems continue to function nominally, except those noted previously or below. *Flight Day 6 (FD6) of STS-124/1J. ISS crew work cycle remains unchanged: wake 6:32am EDT; sleep 10:02pm.*

Crew activities aboard the ISS today centered on three major areas: (1) The second 1J spacewalk, (2) activation of the JPM (Japanese Pressurized Module) Kibo, and (3) preparations for tomorrow's relocation of the JLP (Japanese Logistics Pressurized Module).

Mission 1J's EVA-2 was completed successfully by Mike Fossum & Ron Garan in 7h 11min, accomplishing all its objectives. *[During the spacewalk, Fossum (EV1) & Garan (EV2) –*

(1) Installed Fwd/Aft JTVEs (JEM Television Equipment, i.e., 2 cameras) for monitoring JEM RMS ops (~12:19pm),
(2) Removed 7 thermal covers from each of the JEM RMS' six joints & one end effector (~1:02pm),
(3) Prepared the JPM zenith ACBM (Active Common Berthing Mechanism) for JLP relocation on FD7 (removed ACBM cover; released MMOD/Micrometeoroid Orbital Debris shield launch restraints),
(4) Cleared up late-discovered MLI (Multi-Layer Insulation) cover anomaly on the JPM zenith CBM (could have interfered with the 4 capture latches during JLP relocation/berthing tomorrow) (~1:55pm),
(5) Installed JPM trunnion and keel pin thermal covers (~2:15pm),
(6) Prepared the old S1 Nitrogen Tank Assembly on S1 truss and new spare on ESP-3 (External Stowage Platform 3) for R&R during EVA 3 (~3:45pm), and
(7) Retrieved an ETVCG (External TV Camera Group) camera from CP9 (Camera Port 9) on the left truss.

Official start time of the spacewalk was 11:04am EDT, about 28 minutes ahead of timeline, and it ended at 6:15pm. Total EVA duration (PET = Phase Elapsed Time)

was 7h 11min. It was the 111th spacewalk for ISS assembly & maintenance and the 83rd from the station (61 from Quest, 22 from Pirs, plus 28 from Shuttle) totaling 512h 48min, the second for Expedition 17 and the 11th so far this year. After today's EVA, a total of 143 spacewalkers (111 NASA astronauts, 21 Russians, and 11 astronauts representing Japan-1, Canada-4, France-1, Germany-2 and Sweden-3) have logged a total of 701h 10min outside the station on building, outfitting & servicing. It was the 133rd spacewalk involving U.S. astronauts.]

After wakeup at ~6:32am, ending the 8.5-hr sleep period before the spacewalk, the A/L CL (Airlock Crewlock) hatch was cracked (~7:12am) for a hygiene break/with mask prebreathe for Fossum & Garan, after spending the night on 10.2 psi campout. Around 8:22am, the hatch was closed again by IVs (Intravehicular Crewmembers) for EVA preparations in 10.2 psi, followed by EMU (Extravehicular Mobility Unit) purge & prebreathe. Sergey Volkov, Mark Kelly & Greg Chamitoff assisted the spacewalkers during EMU purge, EMU prebreathe and CL depressurization. EV1/EV2 egress followed after the EMUs were switched to batteries at 11:04am.

Before breakfast, Chamitoff collected his second “wet” saliva sample for the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function). *[IMMUNE protocol requires the collection to occur first thing post-sleep, before eating, drinking and brushing teeth, and all samples are stored at ambient temperature. Along with NUTRITION (Nutritional Status Assessment), INTEGRATED IMMUNE samples & analyzes participant’s blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected at intervals during the collection day using a specialized book that contains filter paper. The liquid saliva collections require that the crewmember soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations.]*

Prior to EVA start, CDR Volkov activated two Kodak DCS760 digital cameras with 28mm lens for the EVA and verified deactivation of all onboard ham radio equipment (Kenwood in SM/Service Module, Ericsson in FGB) to prevent RF interference with the EMUs, as well as proper closure of the protective Lab window shutters.

As the spacewalk went on, monitored by Ken Ham & Mark Kelly, crewmembers Hoshide, Nyberg, Reisman, Volkov, Kononenko & Chamitoff worked in the JPM at various times on carefully choreographed outfitting of Kibo. Major transfers from

JLP and commensurate installation activities in JPM included –

- EPS1 (Electrical Power Systems 1) rack & mating of its umbilicals,
- DMS1 (Data Management Systems 1) rack & mating of its umbilicals,
- WS (Workstation) rack and checking out its C&W (Caution & Warning) panel,
- ICS (Interorbit Communication System) rack,
- SAIBO ("biologic cell") payload rack after installing two monitor display covers (CB/Clean Bench; CBEF/Cell Biology Experiment Facility),
- RYUTAI ("fluid") payload rack,
- JRSR (JEM Resupply Stowage) rack,
- Mating umbilicals for the JEMRMS (Japanese Experiment Module Robotic Manipulator System) console rack transferred last night from the JLP, checking out its C&W (Caution & Warning) panel, and configuring its console (deploying two cue cards),
- Removing launch restraints of the pre-installed EPS2 & DMS racks, and
- Relocating two dummy hard panels from JPM to locations in JLP.

For the JPM outfitting, Hoshide & Nyberg also –

- Deployed the remaining Photo/TV drag-thru cable from Node-2,
- Reconfigured both the "B" string & "A" string HCTLs (Heater Controllers) from LTA (Launch-to-Activation) to On-Orbit, reconnecting appropriate power cables,
- Installed the JPM Channel "A" power jumper (W3009) in the Vestibule (after transfer & connection of EPS1 & DMS1), allowing TKSC (Tsukuba Space Center)/Japan to assume Kibo control,
- Moved the JPM PCS (Portable Computer System) laptop from its temporary location to the JEMRMS rack and mounted it on the rack's right side,
- Set up two SSC (Station Support Computer) laptops in the JPM, one hard-wired, the other off a drag-thru cable (to enable Japanese language, IP Phone, etc.), and
- Configured the DOUG (Dynamic Onboard Ubiquitous Graphics) application on the PCS for the upcoming activation of the RMS in front of Kibo, to receive & display SRMS/SSRMS/JEMRMS joint angle telemetry from the laptop. *[DOUG is a software application that provides a graphical birdseye-view image of the external station configuration and the JEMRMS, showing its real-time location and configuration on a laptop during its operation.]*

In preparation for tomorrow's relocation of the JLP module from Node-2 zenith to JPM with the SSRMS (Space Station Remote Manipulator System) --

- Nyberg deactivated the JLP MKAM (Minimum Keep Alive Monitor) fan which had been turned on temporarily by Reisman earlier this morning as usual to allow ingress into JLP,
- Aki Hoshide unlatched the JPM's overhead hatch,

- Garrett Reisman installed & checked out the CBCS (Centerline Berthing Camera System) at the JPM hatch, and
- Karen & Oleg installed the CPA (Controller Panel Assembly) at the Node-2 zenith hatch so that Flight Controllers at MCC-Houston can make preparations for the JLP relocation during crew sleep,
- Sergey walked off the SSRMS, i.e., ungrappled the JPM PDGF (Power & Data Grapple Fixture), which had provided vital keep-alive power to the JPM, and maneuvered the arm to grapple, at 6:08pm, the MBS (Mobile Base System) PDGF-3 for a ground-commanded base change later tonight (the MT/Mobile Transporter with the MBS was moved yesterday from WS4/ Worksite 4 to WS6).

In the US Lab, MS-1 Nyberg installed the AmiA (Antimicrobial Applicator), brought up on STS-124, in the ITCS (Internal Thermal Control System) and removed its insulation blanket to allow temperature equalization. Later tonight, AmiA will be removed again. *[AmiA is introducing OPA (Ortho-Phthalaldehyde), an antimicrobial agent, into the Lab ITCS coolant.]*

Sergey Volkov terminated battery charging for the “Kelvin-Video” and TTM-2 instruments for another operational run of the Russian KPT-2 science payload BAR-RM, starting tomorrow (6/6) TTM-2 using the RSE-1 laptop, with downlinking via BSR-TM channel. *[Objective of the payload is to experiment with ISS leak detection based on environmental data anomalies (temperature, humidity, and ultrasound emissions) at leak locations. The payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/ thermometer (TTM-2), an ultrasound analyzer (AU-01), and a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station. Measurements are taken in specific zones (13 in SM PkhO and 4 in DC1), both with lights & fans turned on and off.]*

The FE-1 conducted the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the passageways PrK (SM Transfer Compartment)–ATV, PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1. *[This checkup is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).]*

In preparation for a major RS outfitting activity scheduled tomorrow, involving the nominal restoration of mounting structures for the heat exchanger-condenser fans VTK1 & VTK2 of the two Russian SKV air conditioners, the CDR unstowed and readied necessary tooling and reviewed procedures.

After the spacewalkers' return on board at 6:15pm, post-EVA activities by Fossum, Garan, Kelly and Chamitoff in the A/L consist of --

- Recharging the EMU/spacesuits with water from PWR (Payload Water Reservoir),
- Reconnecting the LTAs (Lower Torso Assemblies) to the EMUs,
- Capping the UIA (Umbilical Interface Assembly (no METOX regeneration required),
- Setting up the METOX (Metal Oxide) CO2 absorbers for regeneration in the A/L bake-out oven,
- Downlinked EVA imagery from the Kodak DCS760 camera & readying the camera for EVA-3, and
- Initiating recharge of the EMU (Extravehicular Mobility Unit) batteries in the A/L BSA (Battery Stowage Assembly.

Kononenko switched the Russian Vozdukh CO_2 removal system to manual Mode 5 via the on-board computer system. *[Mode 5 uses two adsorbent cartridges with 10 min cycle time, a vacuum pump cycle time of 1 min, plus 40% airflow during sleep, 60-80% during the day, and 100% during physical exercise, for 3-4 crewmembers.]*

In the SM, Volkov completed the routine maintenance of the SOZh/ECLSS system, including ASU toilet facilities systems/replaceables (see below for update). *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

The CDR also performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

FE-2-17 Chamitoff spent more time (~15 min.) on familiarizing himself with the onboard CMS (Crew Medical Systems) exercise equipment.

In addition, Greg had another hour for himself for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residency.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS

cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1) and VELO cycle with bungee cord load trainer (CDR, FE-1).

Afterwards, Sergey copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~8:15pm EDT, Chamitoff is scheduled for another regular PMC (Private Medical Conference) via S- & Ku-band audio/video.

CDRA Update: After yesterday's R&R of its #2 desiccant/sorbent (#202), the Carbon Dioxide Removal Assembly was declared operational. The fan speed was commanded to 130,000 RPM (revolutions per minute) and will remain at that speed for the remainder of the docked mission.

ASU Update: After the replacement of the failed MNR-NS gas/liquid separator pump of the Russian ASU toilet system by FE-1 Kononenko yesterday, the crew performed several flushes with water to verify a successful R&R, after which ground specialists declared the ASU "Go" for use. Prior to replacement of the pump, the crew had been using the backup Wring Receptacle Assembly instead of the ASU. The crew requested instructions on how to package the failed pump on Flight 1J.

No CEO (Crew Earth Observation) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 5:13am EDT [= epoch]):*
Mean altitude -- 339.7 km
Apogee height -- 343.5 km
Perigee height -- 335.9 km
Period -- 91.33 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005651
Solar Beta Angle -- 17.2 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude gain in the last 24 hours -- 80 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54666

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

STS-124 docked timeline

- *6/06 – FD7 - JLP relocate to JPM; JLP Vestibule leak check; Focused inspection*
- *6/07 – FD8 - JLP Vestibule outfitting; CP9 ETVCG TVCIC R&R*
- *6/08 – FD9 - EVA-3 (10:32am, 7 hrs), S1 NTA R&R, compl JPM outfit (RMS cvr remv), P1 CP9 ETVCG install*
- *6/09 – FD10 - JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R*
- *6/10 – FD11 – "Sayonara" (~4:00pm), hatch close (~4:30pm)*
- *6/11 – FD12 - Undocking (~7:33am); Greg remains, Garrett leaves; OBSS survey/inspection*
- *6/12 – FD13 - Mostly off-duty*
- *6/13 – FD14 - Stowing; deorbit preps*
- *6/14 – FD15 - Deorbit burn*

06/14/08 -- STS-124/Discovery landing (KSC: ~11:02am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (at DC1 nadir)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/04/08
Date:	Wednesday, June 04, 2008 7:35:39 PM
Attachments:	

ISS On-Orbit Status 06/04/08

All ISS systems continue to function nominally, except those noted previously or below. *Flight Day 5 (FD5) of STS-124/1J. ISS crew work cycle remains unchanged: wake 6:32am EDT; sleep 10:02pm.*

Arigato Gozaimasu! ***Congratulations, JAXA! There is Hope in space!*** At ~5:09pm EDT, the JPM (Japanese Pressurized Module) of the JEM "Kibo" laboratory complex was opened and ingressed by Aki Hoshide and Karen Nyberg for the first time, joined later by the rest of the crew who clearly enjoyed the voluminous super laboratory. *[Kibo is permanently attached at the Node-2 (Harmony) portside hatch since last night.]*

FE-1 Oleg Kononenko performed the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the DC1-to-Soyuz tunnel, and the FGB-to-Node passageway. *[This is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).]*

After last night's successful gross leak check of the Kibo/Node-2 vestibule by MS1 Karen Nyberg following the berthing of Kibo to the Node-2 port hatch (7:01pm), FE-2 Garrett Reisman this morning terminated the overnight fine leak check, which confirmed successful hermeticity of the linkup.

Afterwards, MS4 Aki Hoshide & Nyberg were the principal crewmembers charged with today's opening up of the Japanese laboratory. Before hatch opening and first ingress in Kibo at 5:09pm, --

- Hoshide & Nyberg spent ~6 hrs between them on JPM-to-Node-2 vestibule outfitting, setting up equipment including stringing & connecting power cables for routing electricity to Kibo,
- Reisman & Hoshide activated Channel "B" power to provide initial

environmental conditions inside the laboratory for human access; this also allowed transfer of command capability for Kibo from MCC-Houston to JAXA's TKSC (Tsukuba Space Center) in Japan which will activate the A-string systems tomorrow (FD6),

- Kononenko replaced the aft NPRV (Negative Pressure Relief Valve) in the Node-2 port hatch with the regular IMV (Intermodule Ventilation) valve, and
- Aki completed Kibo vestibule outfitting by installing the nitrogen (N_2) supply jumper/hose between Node-2 and JPM.

After ingressing the laboratory wearing PPE (Personal Protective Equipment, i.e., surgical masks plus goggles) for the first few minutes until it was determined that the cabin air was clean of any debris, the crewmembers set up the JPM by –

- Completing the purge of the N_2 system to remove any contamination from the lines,
- Collecting air samples in the JPM using the AK-1M sampler kit before air duct installation,
- Disconnecting and removing the FSE (Flight Support Equipment) Accumulator from the TCS LTL (Thermal Control System/Low Temperature Loop),
- Reconfiguring the TCA GN2 (Thermal Control Assembly Gaseous Nitrogen) Manual Accumulator by opening its isolation valve,
- Transferring & installing two hard dummy panels from the JLP (Japanese Logistics Pressurized Module) and installing them in the JPM in preparation of EPS1 (Electrical Power Systems 1) Rack & WS (Work Station) Rack installation (access to JLP requiring temporary activation of the JLP MKAM/Minimum Keep Alive Monitor fan as usual),
- Transferring the JEMRMS (JEM Robotic Manipulator System) Rack from the JLP to the JPM,
- Deploying necessary drag-through cables from Node-2 into Kibo,
- Removing stowage bags from in front of the EPS2 & DMS2 (Data Management System 2) Racks and stowing them near the JEM AL (Airlock), and
- Configuring the Kibo lab with two PFEs (Portable Fire Extinguishers) from Node-1 & FGB stowage, plus one PBA/QDMA (Portable Breathing Apparatus/ Quick-Don Mask Assembly), a second PBA/QDMA to be added on FD9 after EVA-3.

FE-1 Kononenko had two hours set aside for working a major IFM (In-flight Maintenance) on the Russian ASU toilet facility in the SM (Service Module), removing the failed MNR-NS gas/liquid separator pump of the facility and replacing it with a new unit delivered on STS-124. As of now, the IFM appears to have been

successful: the ASU is working nominally, so far.

Major IFM was also performed by FE-2 Reisman who removed the failed desiccant/ sorbent bed #2 (202) of the US CDRA (Carbon Dioxide Removal Assembly) and replaced it with a new unit delivered on STS-124. FE-2-17 Chamitoff assisted in ythe task as per “dedicated handover”.

CDR Sergey Volkov continued the annual inspection and photo-documentation of window panes in the SM, started earlier (5/28). The observed defects were recorded in image and text files on the RSK1 laptop for subsequent downlink via U. S. OCA assets. *[Objective of the inspection, which uses a digital still camera (Nikon D1X w/SB-28DX flash) and voice recorder, today was to assess the pane surfaces on SM windows 2, 3, 5, 8, 9 for any changes (new cavities, scratches, new or expanded old stains or discolorations affecting transparency properties) since the last inspection, performed by Oleg Kotov on 6/26/07. The new assessment will be compared to the earlier observations. Defects are measured with the parallax method which uses eyeball-sighting with a ruler and a right isosceles triangle to determine the defects' size and position with respect to the window's internal surface (parallax being the apparent change in an object's position resulting from changing the observer's position).]*

Kononenko serviced the Matryoshka-R (RBO-3-2) radiation payload, which has taken over the ESA/RSC-Energia experiment ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS/ALC) with its Spectrometer (AST) and ALC equipment on DC1 panel 429, performing the periodic test on the AST and its current ALC-948 PCMCIA memory card, using the RSK1 laptop for checking the #948 PCMCIA (Portable Computer Memory Card International Adapter).

CDR Mark Kelly & PLT Ken Ham worked in the Node-1 starboard alcove, installing a check valve-hose for A/L CCAA (Common Cabin Air Assembly) safing.

Volkov set up the TTM-2 and “Kelvin-Video” batteries for charging for another operational run of the Russian KPT-2 science payload BAR-RM. Charging will be terminated tomorrow (6/5), with data gathering starting Friday (6/6) using the RSE-1 laptop, with downlinking via BSR-TM channel. *[Objective of the payload is to experiment with ISS leak detection based on environmental data anomalies (temperature, humidity, and ultrasound emissions) at leak locations. The payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/thermometer (TTM-2), an ultrasound analyzer (AU-01), and a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station. Measurements are taken in specific zones (13 in SM PkhO and 4 in DC1), both with lights & fans turned on and off.]*

Sergey also collected Elektron feed water samples from downstream of the BKO multifiltration unit in a drinking bag (paket dlya napitkov) for return to Earth, to monitor the quality of the water being fed from the KOV EDV container through the BKO to the Elektron-VM oxygen generator.

Oleg removed existing tapes from both VDS VTRs (Video Distribution Subsystem/ Video Tape Recorders), labeled them for stowage & return to Houston, then loaded the VTRs with fresh tapes.

At ~9:22am EDT, Volkov & Kononenko linked up with MBI-8 PROFILAKTIKA specialists at TsUP-Moscow via VHF/audio to discuss physical exercise needs for the MBI-8 experiment. *[Data yields from the TVIS treadmill exercises have been insufficient for analysis. Since the Russian VB-3 VELO ergometer does not record exercise data, the discussion focused on ways for the crew to measure and downlink adequate VELO exercise data for MBI-8.]*

FE-2 Reisman spent about 3 hrs on generic handover activities with Greg Chamitoff (who assumes Garrett's FE-2 position after Shuttle departure), starting with Crew Safety Handovers, using a detailed "handover book". *[During these periods crewmembers are scheduled together to complete various designated standard tasks for familiarizing the new station resident with procedures, caveats, etc. There are also dedicated handovers for selected critical activities.]*

Greg Chamitoff also had time reserved for familiarizing himself with the onboard CMS (Crew Medical Systems) exercise equipment.

Kononenko performed the regular updates of onboard SODF (Station Operations Data File) emergency/warning & procedures books with new material delivered on STS-124. *[These include specific Emergency Books deployed in the Lab, Soyuz, SM, A/L (normally in FGB) and Node-2, Warning Books in the Lab, SM and FGB, a Leak Pinpoint Repair Kit in the PMA-1 (Pressurized Mating Adapter 1), plus a POC (Portable Onboard Computer) Book and Printer Cue Cards.]*

Volkov had 30 min set aside for reviewing the new DOUG (Dynamic Onboard Ubiquitous Graphics) software setups for the upcoming SSRMS (Space Station Remote Manipulator System) and JEM RMS (Robotic Manipulator System) operations planned for tomorrow (FD6)

With assistance by Reisman, Greg Chamitoff performed the periodic offloading of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1062) with the collected water slated for processing. No samples were required. *[Transferred quantity is determined by*

allowing tank and CWC equalize with each other. Tank quantity stabilizes at a value higher than the neutral point. Waiting time ~30 min.]

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2, TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-2) and VELO cycle with bungee cord load trainer (FE-1).

Afterwards, Oleg copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

In the SM, the FE-1 completed the routine maintenance of the SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. Removal & replacement of the failed separator pump is on tomorrow's schedule for Kononenko at ~9:30-11:30am EDT. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

CDR Volkov performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

FE-2-17 Chamitoff had another 2.5 hrs for himself for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residency.

Kononenko was to check in Node-2 to verify proper installation of the CVIU (Common Video Interface Unit) VCP J01 video cap at the S3 video camcorder port that is required for transmitting video from the Shuttle to ISS.

Fossum, Garan, Kelly, Ham, Volkov and Chamitoff conducted a one-hour review of timeline & procedures for tomorrow's EVA-2 by Mike Fossum (EV1) & Ron Garan (EV2).

Later, after completing Airlock Equipment Lock (A/L EL) configuration for the spacewalk, including recharging batteries and checking EMU equipment, Mike & Ron will begin their "campout" in the "Quest" A/L, starting mask prebreathe, while configuring EVA tools, at ~8:57pm, then closing hatches and initiating depressurization of the CL (Crewlock) from 14.7 to 10.2 psi. Sleep for them and

the ISS crew will commence at 10:02pm, for the Shuttle crew at ~10:32pm. *[The overnight Campout (nachalo desaturatsiy = desaturation start) in the A/L CL (Crewlock) for denitrogenation/pre-breathe at 10.2 psi lasts about 8.5 hrs. First, the two spacewalkers will perform PBA (Portable Breathing Apparatus) mask prebreathe for denitrogenation, while readying their tools & equipment, then depress the CL from 14.7 to 10.2 psi for their sleep period, to last until ~6:32am EDT tomorrow. The CL hatch will then be cracked at ~7:12am (i.e., temporarily repressurized) for a hygiene break/with mask prebreathe for Fossum & Garan. Around 8:22am, the hatch will be closed again for EVA preps in 10.2 psi, followed by EMU purge & prebreathe. Afterwards, Mark Kelly will support CL depressurization until egress.]*

EVA-2, beginning tomorrow nominally at ~11:32am EDT, will last an estimated 6h 30min, i.e., ending at 6:02pm. PLT Ken Ham will again be IV (Intravehicular) crewmember.

--- EVA-1 main objectives are to:

- *Install Fwd/Aft JTVEs (JEM Television Equipment, i.e., 2 cameras) for monitoring JEM RMS ops,*
- *Remove 7 thermal covers from each of the JEM RMS' six joints & one end effector,*
- *Prepare the JPM zenith ACBM (Active Common Berthing Mechanism) for JLP relocation on FD7 (remove ACBM cover; release MMOD/ Micrometeoroid Orbital Debris shield launch restraints),*
- *Clear up late-discovered MLI (Multi-Layer Insulation) cover anomaly on the JPM zenith CBM (could interfere with the 4 capture latches during JLP relocation/berthing),*
- *Install JPM trunnion and keel pin covers,*
- *Prepare S1 Nitrogen Tank Assembly on S1 truss and spare on ESP-3 (External Stowage Platform 3) for R&R during EVA 3, and*
- *Retrieve ETVCG (External TV Camera Group) camera from CP9 (Camera Port 9) on the left truss.*

At ~5:35pm, Greg is scheduled for another regular PMC (Private Medical Conference) via S- & Ku-band audio/video.

Transfers Update: N_2 transfer from the Shuttle began today. No O_2 transfer is panned for 1J. One filled water CWC (#1098) was transferred to the ISS. As of FD3, middeck resupply transfers were 37% of total, overall cargo transfers 12% of total.

No CEO (Crew Earth Observation) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 12:21pm EDT [= epoch]):*
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Perigee height -- 336.0 km
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Eccentricity -- 0.0005373
Solar Beta Angle -- 21.8 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 300 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54655

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

STS-124 docked timeline

- *6/05 – FD6 - EVA-2 (11:32am, 7 hrs), JPM outfit (JTVE install, JRMS cvr remv), S1 NTA prep, CP 9 ETVCG retrv*
- *6/06 – FD7 - JLP relocate to JPM; JLP Vestibule leak check; Focused inspection*
- *6/07 – FD8 - JLP Vestibule outfitting; CP9 ETVCG TVCIC R&R*
- *6/08 – FD9 - EVA-3 (10:32am, 7 hrs), S1 NTA R&R, compl JPM outfit (RMS cvr remv), P1 CP9 ETVCG install*
- *6/09 – FD10 - JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R*
- *6/10 – FD11 – "Sayonara" (~4:00pm), hatch close (~4:30pm)*
- *6/11 – FD12 - Undocking (~7:33am); Greg remains, Garrett leaves; OBSS survey/inspection*
- *6/12 – FD13 - Mostly off-duty*
- *6/13 – FD14 - Stowing; deorbit preps*
- *6/14 – FD15 - Deorbit burn*

06/14/08 -- STS-124/Discovery landing (KSC: ~11:02am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (at DC1 nadir)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)

10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
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11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/03/08
Date:	Tuesday, June 03, 2008 7:26:37 PM
Attachments:	

ISS On-Orbit Status 06/03/08

All ISS systems continue to function nominally, except those noted previously or below. *Flight Day 4 (FD4) of STS-124/1J. ISS crew work cycle remains unchanged: wake 6:32am EDT; sleep 10:02pm. Welcome to Expedition 17, Greg Chamitoff!*

Mission 1J's EVA-1 was completed successfully by Mike Fossum & Ron Garan in 6h 48min, accomplishing all its objectives. *[During the spacewalk, Fossum (EV1) & Garan (EV2) –*

(1) released an SRMS (Shuttle Remote Manipulator System) elbow camera launch lock,
(2) supported the transfer of the OBSS (Orbiter Boom Sensor System) from ISS to Shuttle RMS (~1:45pm),
(3) checked out MCAS RTL (Mobile Servicing System Common Attach System/Ready-to-Latch) operation (in preparation for ULF-2),
(4) prepared Node-2 port ACBM (Active Common Berthing Mechanism) for the installation of the JPM (Japanese Pressurized Module) laboratory,
(5) opened Node-2 the nadir hatch window cover (in preparation for ULF-2),
(6) prepared the JPM for installation, i.e., disconnected/stowed an LTA (Launch-to-Activation) cable, removed Passive CBM contamination covers, and released the JPM forward window launch lock (~4:10pm)
(7) inspected the "Datum A" surface of the Starboard SARJ (Solar Alpha Rotary Joint),
(8) performed a Stbd SARJ cleaning test using a scraper, wipes and a special grease, and
(9) re-installed the Stbd SARJ TBA-5 (Trundle Bearing Assembly #5) ~4:42pm.

Official start time of the spacewalk was 12:22pm EDT, about 50 minutes behind the timeline (due to an issue with Fossum's "Snoopy" comm cap), and it ended at 7:10pm. Total EVA duration (PET = Phase Elapsed Time) was 6h 48min. It was

the 110th spacewalk for ISS assembly & maintenance and the 82nd from the station (60 from Quest, 22 from Pirs, plus 28 from Shuttle) totaling 505h 37min, the first for Expedition 17 and the 10th so far this year. After today's EVA, a total of 139 spacewalkers (107 NASA astronauts, 21 Russians, and 11 astronauts representing Japan-1, Canada-4, France-1, Germany-2 and Sweden-3) have logged a total of 693h 59min outside the station on building, outfitting and servicing. It was the 131st spacewalk involving U.S. astronauts. Today was also the 43rd anniversary of the first US EVA, by Ed White on Gemini 4 (June 3, 1965).]

Early in the EVA-1, **the Orbiter Boom Sensor System (OBSS) was relocated** from its temporary location on the ISS truss to the Shuttle on Discovery's SRMS. *[After Garan released stanchions & removed a protective bag, with Fossum detaching a KAU (Keep Alive Umbilical), MS4 Akihiko Hoshide and MS1 Karen Nyberg operated the SSRMS (Space Station Remote Manipulator System) to grapple and unberth the OBSS (~1:27pm), then handed it over to the SRMS (Shuttle RMS).]*

Later, the 37-ft long, 14.5-ft wide **JPM Kibo was successfully transferred and installed** on the Node-2 "Harmony" portside dock at 7:01pm (1st stage capture 6:42pm, SSRMS wrist limped 6:43pm, 2nd stage capture 7:01pm). *Aki Hoshide: "Houston, we have a new 'Hope' on the space station!"* After the installation, ISS attitude was maneuvered to the new TEA (Torque Equilibrium Attitude) which Kibo's addition has changed. *[Hoshide & Nyberg operated the SSRMS to grapple, unberth, transfer and reberth the JPM at the Node-2 Port CBM (Common Berthing Mechanism) with the SSRMS in "limp" mode. All motorized bolts have engaged to firmly hold the science laboratory at its place, and leak checks were then initiated on the vestibule between JPM and the Node-2 port. Ingress in Kibo is scheduled for tomorrow at ~ 4:47pm EDT.]*

After wakeup at ~6:32am (by a recording of high school friends of Aki Hoshide singing "Hold Me With The Robot Arm"), ending the 8.5-hr sleep period before the spacewalk, the A/L CL (Airlock Crewlock) hatch was cracked at ~7:12am for a hygiene break/with mask prebreathe for Fossum & Garan, after spending the night on 10.2 psi campout. Around 8:35am, the hatch was closed again by IVs (Intravehicular Crewmembers) for EVA preparations in 10.2 psi, followed by EMU (Extravehicular Mobility Unit) purge & prebreathe. IVs Reisman & Chamitoff assisted the spacewalkers during EMU purge, EMU prebreathe and CL depressurization. EV1/EV2 egress followed after the EMUs were switched to batteries at 12:22pm.

Before breakfast, Chamitoff performed his first session with the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member

Immune Function), collecting wet saliva samples. *[IMMUNE protocol requires the collection to occur first thing post-sleep, before eating, drinking and brushing teeth, and all samples are stored at ambient temperature. Along with NUTRITION (Nutritional Status Assessment), INTEGRATED IMMUNE samples & analyzes participant's blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected at intervals during the collection day using a specialized book that contains filter paper. The liquid saliva collections require that the crewmember soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations.]*

Prior to EVA start, FE-1 Oleg Kononenko verified deactivation of onboard ham radio equipment (Kenwood in SM & Ericsson in FGB) to prevent RF interference with the EMUs, as well as proper closure of the protective Lab window shutters.

At the Node-2 port hatch, MS4 Hoshide powered up the CBCS (Centerline Berthing Camera System) in preparation for today's Kibo JPM berthing. Tonight before sleep time, Aki will disassemble the CBCS again and remove it.

Pre-dock activities by FE-2 Garrett Reisman included transferring a PBA (Portable Breathing Apparatus) from its location in Node-1 into the Airlock (A/L) for EVA support.

Kononenko conducted the standard functional check of the IP-1 airflow sensors in the various RS (Russian Segment) hatchways.

With the docked Discovery adding to the station's interior spaces, Garrett checked up on air flow by taking Velocicalc measurements between Shuttle, Node 2 and the Lab.

Afterwards, the FE-1 connected the accelerometer in the Shuttle airlock to an IWIS RSU (Internal Wireless Instrumentation System/Remote Sensor Unit). *[This enabled a total of 6 RSUs throughout the stack to collect data for three 1J events: today's JPM berthing, the JLP (Japanese Logistics Pressurized Module) relocation on FD7, and the dedicated Russian thruster firing on FD10. IWIS is an SDTO (Station Development Test Objective) that records structural measurements to validate math models used in loads analysis. The data will be used to reduce conservatism and might allow relaxation of operational constraints on activities such as crew exercise, vehicle dockings and reboosts that impart structural loads to ISS. The data will also provide more accurate fatigue calculations that could result in an extension of the ISS life.]*

Kononenko also conducted the periodic/long-term inspection of the SM RO (Service Module Working Compartment)'s pressure hull and ring, looking for any moisture, deposits, mold, corrosion and pitting behind panels 130, 134, 135, 138, 139, 454, also underneath the TVIS treadmill (where deposit was discovered earlier) and the cold plates (where SNT and STR lines are installed). *[The inspection of the hull surface, which is coated with a primer and dark-green enamel, is done using cleaning napkins to wipe the area in question if required and reporting results to the ground. The hull inspection looks for changed color and cavities; if cavities are found, they are to be measured for depth (with chewing gum) after cleaning. Digital photographs of the shell before and after the removal of deposits were to be made for documentation.]*

Also during the spacewalk, Garrett Reisman performed the periodic activation & checkout on the CSA-CP (Compound Specific Analyzer-Combustion Products) instruments. *[This included the current prime unit (#1044), three backup units (#1045, #1051, #1058), sampling pumps (#1021, #1019), and four new CSA-CPs delivered on STS-124 (#1028, #1029, #1030, #1031), transferred yesterday from the Orbiter. The four new units received new batteries and, were verified to be free of contamination, plus zero-calibrated for use on ISS.]*

In the SM, Kononenko took the periodic readings of potentially harmful atmospheric contaminants with the CMS (Countermeasure System) component of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite which uses preprogrammed microchips to measure H_2CO (Formaldehyde, methanal), CO (Carbon Monoxide) and NH_3 (Ammonia), taking one measurement per microchip. *[CMS is a subsystem of the Russian SKDS Pressure Control & Atmosphere Monitoring System.]*

Garrett Reisman conducted the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week. The current cue card (17-0002I) lists 31 CWCs (~1199.5 L total) for the four types of water identified on board: technical water (619.6 L, for Elektron, flushing, hygiene, including 423.2 L non-usable water because of Wautersia bacteria), potable water (534.8 L, incl. 88.7 L currently on hold), condensate water (39.3 L), waste/EMU dump and other (5.8 L). Wautersia bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]*

CDR Volkov, with Chamitoff assisting, performed the standard leak check on Greg's new Sokol pressure suit (to be used in case of TMA-12 contingency return, then set

it up in the Soyuz BO (Orbital Module) for airing out, i.e., drying out any humidity. Kononenko later repeated the process on the Sokol gloves and stowed them with the suit in the BO.

After the spacewalkers' return on board at 7:10pm, post-EVA activities by CDR Volkov and FE-2-17 Chamitoff in the A/L will consist of --

- Recharging the EMU/spacesuits with water from PWR (Payload Water Reservoir), then
- Reconnecting the LTAs (Lower Torso Assemblies) to the EMUs and
- Capping the UIA (Umbilical Interface Assembly (no METOX regeneration required),
- Preparing the CVIU (Common Video Interface Unit) in Node-2, and
- Taking photographs of the EMU gloves for downlink and inspection.

Other post-EVA activities by crewmembers include –

- Returning the PBA unit from the A/L to its original stowage location in Node-1 (FE-2),
- Downlinking EVA photography (FE-2),
- Manual closure of the nitrogen (N_2) supply valve at the A/L in preparation for the N_2 line depress during FD5 activities (FE-2-17), and
- Disconnecting the IWIS RSU cable to the Shuttle airlock (FE-1).

In the SM, Sergey Volkov completed the routine maintenance of the SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. Removal & replacement of the failed separator pump is on tomorrow's schedule for Kononenko at ~9:30-11:30am EDT. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

FE-1 Kononenko performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The ISS crew completed their physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1). *[For load reasons, no exercise is allowed on ISS or Shuttle while both robotarms are grappled.]*

Later, Oleg copied the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Greg Chamitoff had ~2.5 hrs for himself for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residency.

At ~8:00pm, Greg is scheduled for his first regular PMC (Private Medical Conference) via S- & Ku-band audio/video.

No CEO (Crew Earth Observation) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 6:04am EDT [= epoch]):*
Mean altitude -- 339.6 km
Apogee height -- 343.3 km
Perigee height -- 336.0 km
Period -- 91.33 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005391
Solar Beta Angle -- 26.6 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 265 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54635

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

STS-124 docked timeline

- *6/04 – FD5 - JPM Vestibule outfitting, JPM ingress (~4:47pm), Reisman/Chamitoff handovers*
- *6/05 – FD6 - EVA-2 (11:32am, 7 hrs), JPM outfit (JTVE install, JRMS cvr remv), S1 NTA prep, CP 9 ETVCG retrv*
- *6/06 – FD7 - JLP relocate to JPM; JLP Vestibule leak check; Focused inspection*
- *6/07 – FD8 - JLP Vestibule outfitting; CP9 ETVCG TVCIC R&R*
- *6/08 – FD9 - EVA-3 (10:32am, 7 hrs), S1 NTA R&R, compl JPM outfit (RMS cvr remv), P1 CP9 ETVCG install*
- *6/09 – FD10 - JRMS checkouts, JLP Vestibule outfitting, A/L BCM*

R&R

- *6/10 – FD11 – "Sayonara" (~4:00pm), hatch close (~4:30pm)*
- *6/11 – FD12 - Undocking (~7:33am); Greg remains, Garrett leaves; OBSS survey/inspection*
- *6/12 – FD13 - Mostly off-duty*
- *6/13 – FD14 - Stowing; deorbit preps*
- *6/14 – FD15 - Deorbit burn*

06/14/08 -- STS-124/Discovery landing (KSC: ~11:02am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (at DC1 nadir)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/02/08
Date:	Monday, June 02, 2008 2:18:36 PM
Attachments:	

ISS On-Orbit Status 06/02/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 7 of Increment 17. Flight Day 3 (FD3) of STS-124/1J. ISS crew work cycle today: wake 6:32am EDT; sleep 10:02pm.*

STS-124/Discovery docked smoothly at the PMA-2 (Pressurized Mating Adapter-2) port at 2:03pm EDT, nine minutes behind timeline, in darkness (orbital sunset ~1:23pm), after successfully completing the RPM (R-Bar Pitch Maneuver) in daylight at ~1:08pm and arriving at +V-Bar (straight in front of ISS) at ~1:11pm. The station now hosts ten occupants again as Mission 1J is underway. *[The combined crew is comprised of ISS CDR Volkov, FE-1 Oleg Kononenko, FE-2 Garrett Reisman, STS CDR Mark Kelly, PLT Ken Ham, MS1 Karen Nyberg, MS2 Ron Garan, MS3 Mike Fossum, MS4 Akihiko Hoshide (Japan), and MS5/FE-2-17 Greg Chamitoff who replaces Reisman as FE-2, as the latter returns on Discovery as MS-5.]*

Hook closure to rigidize the Shuttle-ISS linkup was at ~2:10pm. After the docking, the station was reoriented as planned to minimize the risk of micrometeoroid/debris impacts upon the Shuttle (-XVV = -x-axis in velocity vector, +z-axis in local vertical). *[Earlier, at ~10:33am, the ISS maneuvered to docking attitude after attitude control authority was handed over from USOS (US Segment) to RS MCS (Russian Segment Motion Control System).]*

Preparatory to the Shuttle arrival, FE-2 Reisman verified closure of the Lab science window shutter as protection against thruster plumes. *[The window shutter must remain closed when Shuttle is within 3000 ft/915m of the ISS. It may be opened for no more than 15 minutes for photo documentation if the Shuttle is in free drift.]*

Early in the morning, after wakeup and breakfast, the FE-2 set up for INTEGRATED IMMUNE saliva collection for his final session of the assessment which includes a blood draw before undocking. His saliva and blood collections will be aligned with

IMMUNE collections by Shuttle crewmembers Fossum, Hoshide and Chamitoff. *[Integrated Immune is a 24-hr.assessment of human immune system changes, with the objective to investigate immune neuro-endocrine reactions in the space environment by studying samples of saliva, blood and urine using collection kits and the biomedical (MBI) protection kit, to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected at intervals during the collection day using a specialized book that contains filter paper. The liquid saliva collections require that the crewmember soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations. The on-orbit blood samples are collected right before undocking and returned on the Shuttle so that analysis can occur with 48 hours of the sampling. This allows assays that quantify the function of different types of white blood cells and other active components of the immune system. Saliva samples are secured in the MELFI (Minus-Eighty Laboratory Freezer for ISS). Also included are entries in a fluid/medications intact log, and a stress-test questionnaire to be filled out by the subject at begin and end. Urine is collected during a 24-hour period, conventionally divided into two twelve-hour phases: morning-evening and evening-morning.]*

Before the docking, FE-1 Kononenko performed final STTS communications configuration checks for the docking. Upon docking, Oleg switched USOS/RS comm systems to their mated-flight mode.

Reisman installed the IWIS (Internal Wireless Instrumentation System) hardware preparatory to the 1J docked period docking. *[This enables a total of 6 RSUs (Remote Sensor Units), including one RSU to be attached to an accelerometer in the Orbiter airlock, to collect data for three 1J events: JPM (Japanese Pressurized Module) Berthing on FD4 (Flight Day 4), JLP (Japanese Logistics Pressurized* Module) Relocation on FD7, and Dedicated Russian Thruster Firing on FD10. *IWIS is a Station Development Test Objective (SDTO) that records structural measurements to validate math models used in loads analysis. The data will be used to reduce conservatism and might allow relaxation of operational constraints on activities such as crew exercise, vehicle dockings and reboosts that impart structural loads to ISS. The data will also provide more accurate fatigue calculations that could result in an extension of the ISS life.]*

Other pre-docking preparations:

- Oleg performed the standard functional check of the IP-1 airflow sensors in the various RS hatchways;
- Garrett hooked up the UOP DCP (Utility Outlet Panel/Display & Control Panel) power bypass cable at the CUP RWS (Cupola Robotic Work Station) to allow video coverage of the Shuttle's approach and docking with the SSRMS

(Space Station Remote Manipulator System) cameras;

- Sergey & Garrett readied RPM (R-Bar Pitch Maneuver) photo/video equipment, including camera battery checks, for Orbiter TPS (Thermal Protection System) documentation *[Reisman wielded the 400mm-lens camera, Volkov the 800mm-lens camera for documenting the tile acreage and bottom-side door seals]*, and
- Oleg set up & later activated the camera timers upon Orbiter RPM initiation *[timers indicate beginning and end of the bottom-side photography window].*

Shortly before the docking, the crew configured the Russian MCS for the automatic "PMA-2 Arrival" mode, an operational sequence used to monitor Orbiter arrival at the PMA-2. *[At "Capture Confirmed", ISS attitude was immediately set to freedrift for about 27 min. to allow dampening out relative motions of ISS and Discovery (with the ODS (Orbiter Docking System) dampers/shock absorbers), then maneuvered to "Mated TEA" (Torque Equilibrium Attitude) to account for the new overall configuration with Discovery docked.]*

Docking took place at 2:03pm. After leak checks of the ODS vestibule for about an hour, ISS/STS hatches will be opened at (nominally) ~3:16pm.

After hatch opening, before installation of the ventilation airduct between station and Discovery, Oleg Kononenko will be performing the standard collection of air samples with the Russian AK-1M sampler in the SM, FGB, Lab, and then also in the Orbiter.

After the traditional welcome ceremony (~4:00pm), the new arrivals are to receive the mandatory 25-min. safety briefing.

FE-2 Reisman, along with CDR Kelly and PLT Ham, will then work on the Node-2 O_2 (oxygen) supply line, purging it with N_2 (nitrogen) and configuring it to allow Shuttle to supply O_2 to the ISS PBAs (Portable Breathing Apparatus) in support of pre-EVA mask prebreathe for denitrogenation.

Greg Chamitoff will transfer his IELK (Individual Equipment Liner Kit) from the Shuttle to the Soyuz TMA-12/16S crew return vehicle where Sergey Volkov installs it for the new FE-2. Garrett Reisman's IELK will be pulled out and temporarily stowed for return to Earth.

Kononenko is scheduled to deploy and activate the SSC WRLS (Station Support Computer/ Wireless Router) laptop in Node-2 to joint the Shuttle & Station LANs (Local Area Networks) during the 1J docked period,

In preparation for tomorrow's EVA-1, the FE-1 will also prepare a DCS760 camera for EVA use, leaving it connected to vehicle power until the EMU/prebreathe.

First cargo transfers from the Shuttle middeck to the ISS are scheduled for Ham, Garan, Fossum, Nyberg, Hoshide and Chamitoff. *[Transfers will include EVA hardware (EMU/spacesuits #3015 & #3017 for Fossum & Garan, Systems 1 bag, Tools Transfer bag), new ODFs (Operations Data Files), CHeCS CTB (Crew Health Care Systems/Cargo Transfer Bag 1) for FD4 CSA-CP activities, two mesh bags loaded with items before docking, etc.]*

Later tonight, Kononenko is work in Node-2 to prepare CVIUs (Common Video Interface Units) to allow transmission of video from the Shuttle for camcorder operations in Node-2. *[This will require the installation of the VCP J01 video cap at the Node-2 video port S3 (camcorder port).]*

After completing Airlock Equipment Lock (A/L EL) configuration for the first spacewalk tomorrow and conducting a joint review of EVA-1 timeline & procedures with all crewmembers at ~6:25pm tonight, the two spacewalkers, Mike Fossum (EV1) & Ron Garan (EV2), will begin their "campout" in the "Quest" A/L, starting mask prebreathe, while configuring EVA tools, at ~8:55pm, then closing hatches and initiating depressurization of the CL (Crewlock) from 14.7 to 10.2 psi. Sleep for them and the ISS crew will commence at 10:02pm, for the Shuttle crew at ~10:32pm. *[The overnight Campout (nachalo desaturatsiy = desaturation start) in the A/L CL (Crewlock) for denitrogenation/pre-breathe at 10.2 psi lasts about 8.5 hrs. Before, the two spacewalkers will perform PBA (Portable Breathing Apparatus) mask prebreathe for denitrogenation, while readying their tools & equipment, then depress the CL from 14.7 to 10.2 psi for their sleep period, to last until ~7:12am EDT tomorrow. The CL hatch will then be cracked (i.e., temporarily repressurized) for a hygiene break/with mask prebreathe for Fossum & Garan. Around 8:35am, the hatch will be closed again for EVA preps in 10.2 psi, followed by EMU purge & prebreathe. Afterwards, Garret, Mark & Greg will support CL depressurization until egress.]*

EVA-1, beginning tomorrow nominally at ~11:32am EDT, will last an estimated 6h 30min, i.e., ending at 6:02pm. Ken Ham will be IV (Intravehicular) crewmember.
---EVA-1 main objectives are:

- *Release SRMS (Shuttle Remote Manipulator System) elbow camera launch lock;*
- *Transfer OBSS (Orbiter Boom Sensor System) from ISS to Shuttle;*
- *Check out MCAS RTL (Mobile Servicing System Common Attach System/ Ready-to-Latch) operation (in preparation for ULF-2);*
- *Prepare Node-2 port ACBM (Active Common Berthing Mechanism) for JPM install;*

- *Open Node 2 nadir hatch window cover (in preparation for ULF-2);*
- *Prep JPM for install (disconnect/stow LTA (Launch-to-Activation) cable, remove Passive CBM contamination covers, release JPM forward window launch lock);*
- *Inspect Datum A surface of Starboard SARJ (Solar Alpha Rotary Joint);*
- *Perform Stbd SARJ cleaning test; and*
- *Install Stbd SARJ TBA-5 (Trundle Bearing Assembly #5).*

Earlier today, the ISS crew completed their physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), RED resistive exercise device (FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR). *[For load reasons, no exercise is allowed on ISS or Shuttle while both robotarms are grappled.]*

Later, Reisman copied the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

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Eccentricity -- 0.0005378
Solar Beta Angle -- 31.3 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 78 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54619

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

STS-124 docked timeline

- *6/03 – FD4 - EVA-1 (11:32am, 6.5 hrs.), OBSS transfer, JPM prep, S3/S4 SARJ TBA install, JPM install; Fossum/Garan (EV1/EV2)*
- *6/04 – FD5 - JPM Vestibule outfitting, Reisman/Chamitoff handovers*
- *6/05 – FD6 - EVA-2 (11:32am, 7 hrs), JPM outfit (JTVE install, JRMS cvr remv), S1 NTA prep, CP 9 ETVCG retrv*
- *6/06 – FD7 - JLP relocate to JPM; JLP Vestibule leak check; Focused inspection*
- *6/07 – FD8 - JLP Vestibule outfitting; CP9 ETVCG TVCIC R&R*
- *6/08 – FD9 - EVA-3 (10:32am, 7 hrs), S1 NTA R&R, compl JPM outfit (RMS cvr remv), P1 CP9 ETVCG install*
- *6/09 – FD10 - JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R*
- *6/10 – FD11 – "Sayonara" (~4:00pm), hatch close (~4:30pm)*
- *6/11 – FD12 - Undocking (~7:33am); Greg remains, Garrett leaves; OBSS survey/inspection*
- *6/12 – FD13 - Mostly off-duty*
- *6/13 – FD14 - Stowing; deorbit preps*
- *6/14 – FD15 - Deorbit burn*

06/14/08 -- STS-124/Discovery landing (KSC: ~11:02am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
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09/12/08 -- Progress M-65/30P docking (at DC1 nadir)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking

11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 06/01/08
Date:	Sunday, June 01, 2008 1:35:51 PM
Attachments:	

ISS On-Orbit Status 06/01/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – a busy pre-docking day for CDR Volkov, FE-1 Kononenko & FE-2 Reisman. Ahead: Week 7 of Increment 17.*

Aboard ISS, the shifted wake/sleep cycle began this morning at 6:32am EDT, with sleep time tonight at 10:02pm. *[Setting the crew up for tomorrow's docking.]*

STS-124/Discovery (ISS-1J) continues its catch-up flight for the FD3 docking at ~1:54pm, to begin ISS Stage 1J. (Catch-up rate ~480 nmi. per revolution of ~91.5 min.). *[Hatch opening expected at ~3:10pm, followed by Safety Briefing (~4:02pm), Soyuz seat liner transfer (for the Reisman/Chamitoff exchange), and preparations for the first spacewalk, EVA-1, by EV1 Fossum & EV2 Garan on 6/3, preceded by their overnight Campout tomorrow night in the Airlock (A/L) for denitrogenation/pre-breathe. Objectives of the nominal 14-day mission: Delivering & installing the JAXA Kibo laboratory, delivering new ISS-17 crewmember Greg Chamitoff, bringing Garrett Reisman back home and conducting a total of three EVAs. Landing will nominally be at KSC on FD15 (6/14) at ~11:02am EDT. OMS Anomaly: During ascent, the left OMS (Orbital Maneuvering System) secondary TVC (Thrust Vector Control) positions failed to null in both pitch and yaw, most likely due to a failure in its (independent) power supply. Left OMS is now parked, aligned through EOM CG (End-of-Mission Center-of-Gravity). Remaining on-orbit OMS burns will be single-engine using right OMS only. The deorbit burn will be dual-engine using the (active) primary TVC of the left OMS Primary TVC.]*

CDR Volkov, like his crewmates, had his hands full to prepare for the 1J arrival, starting out with the all-day formatting of the necessary P/TV (Photo/Video) storage devices for the Orbiter RPM (R-bar Pitch Maneuver) photo shoot tomorrow . *[Rbar = along the radius vector of the ISS, downward. During the RPM at ~600 ft from the station, the ISS crew will have only ~90 seconds for taking high-resolution digital photographs, using the 400mm & 800mm telephoto lenses, of all tile areas and door*

seals on the Discovery from SM windows 6 & 8, to be downlinked for launch debris assessment. Thus, time available for the shooting will be very limited, requiring great coordination between the two headset-equipped photographers and the Shuttle. Sergey formatted, in a Kodak DCS 760 camera on station power, eight 1GB PCMCIA (Portable Computer Memory Card International Adapter) flash cards, each one taking ~20 minutes. Afterwards, the reformatted cards were transferred to the SM (Service Module) for the DCS 760 camera configuration to get ready for the RPM documentation.]

For the high-pressure P/TV activity, the CDR also recharged a total of 4 batteries for two DCS digital still cameras (plus one backup), all four simultaneously for at least three hours. The three cameras were then configured and stowed ready for use in the SM. *[The three DCS760 cameras are #1019 (800mm lens), #1012 (400mm lens), #1038 (backup).]*

In Node-2, FE-2 Reisman used the FFTD (Fluid Fitting Torque Device) tool to remove the PPRV (Positive Pressure Relief Valve) sample port cap and replaced its metal Gamah fitting seal with a soft Gamah seal.

Volkov performed the regular bi-weekly reboots of the SSC (Station Support Computer) OCA Comm Router and File Server A31p laptops.

FE-1 Kononenko spent time in the US Airlock (A/L) on staging and relocating EMU (Extravehicular Mobility Unit) hardware in preparation for the 1J EVAs. *[EMUs 3003, 3004 (backup for Garan) and 3018 were readied, with old cuff checklists, mini workstations, tethers & helmet light/EMU TV assemblies removed from the spacesuits on the EDDAs (EMU Don Doff Assemblies); EMUs 3003 & 3004 were then taken off the EDDAs), etc.]*

The FE-1 also readied the equipment required for prebreathe using O_2 (oxygen) piped over from the Shuttle. *[Activities included removal of a closeout panel, tool pre-gathering and relocating a PBA (Portable Breathing Apparatus) from the COL (Columbus Orbital Laboratory) to the Lab for stowage near the ORCA (Oxygen Recharge Compressor Assembly). Background: For the upcoming 1J activities, specialists have developed a detailed "Musical Chairs" plan for moving PFE/PBA fire safety devices around the station's interior as required for quick access.]*

Also in support of upcoming 1J activities, Kononenko powered on PCS (Portable Computer System) laptops in the Node-2, Lab (Cupola) and A/L.

FE-2 Reisman set up the all-important OSTPV (Onboard Short Term Plan Viewer) application for the correct MET (Mission Elapsed Time) from yesterday's launch

(GMT 152/2008 21:02) plus modifications to account for the Discovery crewmembers' timelines.

Later, Garrett conducted the periodic offloading of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1054) with the collected water slated for processing. Two samples were required this time, for return to Earth on STS-124. *[Estimated offload time before reaching the tank's neutral point (leaving ~6 kg in the tank): ~30 min.]*

Return-to-ground fluid samples were also collected by Volkov of the US ITCS (Internal Thermal Control System) from the LAB1D5 MTL (Moderate Temperature Loop) sample port after flushing. *[No ammonia or OPA (Ortho-Phthalaldehyde) test samples required.]*

Afterwards, the CDR consolidated ITCS sampling hardware, labeling and organizing sample bags and OPA test strips in the CQMK (Coolant Quality Monitoring Kit) in preparation for the addition of a second Nomex CQMK arriving on 1J.

In the JLP (Japanese Experiment Module Logistics Pressurized Module), Reisman performed the periodical HCTL (Heater Controller) status and shell temperature check from the MKAM (Minimum Keep-Alive Monitor).

In preparation for 1J, Garrett supported the ground in pressurizing & leak-checking the PMA-2 (Pressurized Mating Adapter 2) for ingress, hatch opening and stowage after the Shuttle's arrival. *[PMA-2 will be the docking port for Discovery tomorrow.]*

The FE-2 also had another hour set aside for more personal departure preparations.

To increase Shuttle ventilation, Sergey Volkov installed a temporary THC IMV (Temperature & Humidity Control/Intermodule Ventilation) airduct in Node-2 and then also configured the IMV diffuser in the Lab to optimize Lab airflow for the "docked stack" configuration.

In the SM, Kononenko completed the routine maintenance of the SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Oleg performed the daily IMS maintenance, updating/editing its standard "delta file"

including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

At ~11:50am EDT, CDR Volkov has his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

Tonight, the three crewmembers are scheduled for their regular periodic PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Sergey at ~7:40pm, Oleg at ~7:58pm, Garrett at ~8:40pm.

Working off the discretionary “if time permits” task list, Kononenko had his fifth run with the Russian DZZ-2 "Diatomeya" ocean observations program, using the NIKON F-5 digital still camera with 80-200 mm lens and the HDV (high-definition) video camcorder from SM windows 7 & 8 to identify areas with intensive bioproduction confined to the largest upwelling of oceanic floors. *[June is a period of extensive phytoplankton blooming in the waters of the Northern hemisphere. Also, June is associated with the end of a dry season and the start of a rainy season in the largest river basins of India, West Africa, and South America. Uplinked target zones were in the Pacific Ocean (geographic point to the west of Chile, Costa Rica seashore) and in the North Atlantic (Panamanian seashore, geographic point to the east of Newfoundland).]*

Also off the Russian suggestions list, Oleg was to perform a session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program, using the D2X to take telephotos. *[Uplinked target zones were the Kazbek volcano with glaciers on the northern slope, including the Kolka glacier, oil slicks in the floodplain of the river Terek all the way to the estuary, looking for drill platforms in the Caspian Sea, conditions of the coastal line of the drying Aral Sea, general views of the Balkan countries from various angles for EPO, and Moldavian river beds (series of overlapping shots from lagoons near the sea, upstream).*

No CEO (Crew Earth Observation) photo targets uplinked for today.

CEO photography can be studied at this “Gateway” website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 4:01am EDT [= epoch]):*
Mean altitude -- 340.0 km
Apogee height -- 343.6 km
Perigee height -- 336.4 km
Period -- 91.33 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.000539
Solar Beta Angle -- 36.1 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 72 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54602

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
06/02/08 – FD3 - STS-124/Discovery/1J docking (1:54pm)

-- *STS-124 docked timeline:*

- *6/03 – FD4 - EVA-1 (11:30am, 6.5 hrs.), OBSS transfer, JPM prep, S3/S4 SARJ TBA install, JPM install; Fossum/Garan (EV1/EV2)*
- *6/04 – FD5 - JPM Vestibule outfitting, Reisman/Chamitoff handovers*
- *6/05 – FD6 - EVA-2 (11:30am, 7 hrs), JPM outfit (JTVE install, JRMS cvr remv), S1 NTA prep, CP 9 ETVCG retrv*
- *6/06 – FD7 - JLP relocate to JPM; JLP Vestibule leak check; Focused inspection*
- *6/07 – FD8 - JLP Vestibule outfitting; CP9 ETVCG TVCIC R&R*
- *6/08 – FD9 - EVA-3 (10:30am, 7 hrs), S1 NTA R&R, compl JPM outfit (RMS cvr remv), P1 CP9 ETVCG install*
- *6/09 – FD10 - JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R*
- *6/10 – FD11 – "Sayonara" (~4:00pm), hatch close (~4:30pm)*
- *6/11 – FD12 - Undocking (~7:33am); Greg remains, Garrett leaves; OBSS survey/inspection*
- *6/12 – FD13 - Mostly off-duty*
- *6/13 – FD14 - Stowing; deorbit preps*
- *6/14 – FD15 - Deorbit burn*

06/14/08 -- STS-124/Discovery landing (KSC: ~11:02am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (at DC1 nadir)
10/01/08 -- **NASA 50 Years**

10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 05/31/08
Date:	Saturday, May 31, 2008 5:11:39 PM
Attachments:	image001.jpg

ISS On-Orbit Status 05/31/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – light-duty but long day for CDR Volkov, FE-1 Kononenko & FE-2 Reisman.*

STS-124/Discovery (ISS-1J) lifted off right on time (5:02pm EDT) with all systems performing nominally, for ISS rendezvous on Monday (6/2), to dock at ~1:54pm EDT. At launch, the ISS was off Halifax/Canada, at 42.8 deg N Lat, 57.6 deg W Long. The Orbiter is carrying the seven-member crew of CDR Mark Kelly, PLT Ken Ham, MS1 Karen Nyberg, MS2 Ron Garan, MS3 Mike Fossum, MS4 Akihiko Hoshide & MS5 Greg Chamitoff. Chamitoff will replace ISS Flight Engineer 2 Garrett Reisman who returns on 6/14 (nominal) with STS-124. STS-124 is the 123rd space shuttle flight, the 35th flight for Discovery, the 26th flight to the station and the third Shuttle flight in 2008. Its primary payload, the largest so far, is the 32,000-lbs, 36.7-f long JPM (Japanese Pressurized Module) with its RMS (Remote Manipulator System). We are off to another great mission! ***[For the eighth crewmember on board, a stow-away, see picture below.]***

For the ISS crew, the new wake/sleep cycle shift begins tonight with a late bedtime of 10:00pm EDT (wake-up this morning: 2:00am). *[Wake/sleep tomorrow (Sunday): 6:32am-10:02pm; on Monday (docking day): 6:32am-10:02pm.]*

Volkov, Kononenko & Reisman performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the Service Module (SM) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

As part of the house cleaning, the crew also performed regular maintenance inspection & cleaning on fan grilles in the FGB (FS5 & FS6, TsV2), SM (VPkhO & VPrK), DC1 (V3) and in the COL (Columbus Orbital Laboratory).

Garrett Reisman stopped sampling mode on the ANITA (Analyzing Interferometer for Ambient Air) payload, exited its software and powered down the ANITA laptop. Later, at ~2:00pm, ANITA was turned back on.

The FE-2 then supported SAMS (Space Acceleration Measurement System) ground commanding by activating its ICU (Interim Control Unit) in Rack LAP2/Drawer 1. *[SAMS acquires acceleration data relevant to characterization of the dynamic vibratory environment on the ISS.]*

In preparation for Discovery's arrival on 6/2, the crew jointly conducted a refresher review of RPM (R-Bar Pitch Maneuver) documentation. *[The review prepared the crewmembers for the bottom-side mapping of the Orbiter at its arrival on 6/2. During the RPM at ~600 ft from the station, the "shooters" have only ~90 seconds for taking high-resolution digital photographs of all tile areas and door seals on Discovery, to be downlinked for launch debris assessment. Thus, time available for the shooting will be very limited, requiring great coordination between the two headset-equipped photographers and the Shuttle pilot.]*

Performing "get-aheads" for JPM "Kibo" laboratory arrival, FE-2 Reisman worked in the JLP (JEM Logistics Module) after activating the JLP MKAM (Minimum Keep Alive Monitor) fan and temporarily moving the JLP's PBA (Portable Breathing Apparatus) from its location COL1PF in the COL (Columbus Orbital Laboratory) to the JLP endcone (JLP1F3). *[For the upcoming 1J activities, specialists have developed a "PFE/PBA Musical Chairs" plan for moving these fire safety devices around the station's interior as required for quick access.]*

Reisman's work in the JLP was to retrieve two panels for the JPM from behind payload racks, which he had to rotate down for access and later return to the upright position, a ~10-min task each time. *[For a hard decorative panel, stowed at JLP1SA2, Garrett unlocked & rotated the Ryutai rack, for a soft protective panel, at JLP1FP2, the EPS-1 (Electrical Power Systems 1) rack. Ryutai ("fluid") is a Japanese multipurpose experiment/payload rack system to support the FPEF (Fluid Physics Experiment Facility), SCOF (Solution Crystallization Observation Facility), PCRF (Protein Crystallization Research Facility) and the IPU (Image Processing Unit) by providing structural interfaces, power, data, cooling, water and other items needed to operate science experiments in micro-G.]*

The FE-2 then removed a front bracket from the JLP WS (Work Station) Rack and bundled it together with the two panels. Afterwards, he deactivated the JLP MKAM fan and returned the PBA to the COL1PF location.

In the SM, Volkov completed the routine maintenance of the SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

The FE-2 had another hour set aside for more personal departure preparations. *[Garrett returns to Earth with STS-124 on 6/14, departing from the ISS on 6/11 (FD12).]*

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

Afterwards, Garrett transferred the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~10:15am EDT, Kononenko had his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

Working off the discretionary “if time permits” task list, Sergey Volkov completed another EKON KPT-3 session, making observations and taking aerial photography of environmental conditions (water contamination in the Kerch Strait) for Russia's Environmental Safety Agency (EKON) using the Nikon D2X digital camera with SIGMA 300-800mm telephoto lens.

Also off the Russian suggestions list, Oleg Kononenko performed a session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program, using the D2X to take telephotos. *[Uplinked target zones were the Pamir mountain range (glacier tongues located to the west of the largest Fedchenko glacier), large glaciers of Tien-Shan located to the east of lake Issyk-Kul, oil slicks in the Caspian Sea, condition of drying out shores of the Aral sea, logging sites and burnt out forest, the Caucasus mountains forest cover condition from the coast to Stavropol plain, the Volga-Akhtubinsk flood plain situation during hydropower plant water spillover (general view and close-up shots).]*

WDS Update: An updated Water Delivery System “cue card” was uplinked for the crew’s reference. *[The new card (17-0002H) lists 32 CWCs (~1182.2 L total) for the four types of water identified on board: technical water (619.6 L, for Elektron, flushing, hygiene), potable water (534.8 L), condensate water (23 L), waste/EMU dump and other (5.8 L). Of the 32 containers, 11 CWCs with technical water (423.2 L) can only be used for flushing due to* Wautersia *bacteria contamination, and 2 CWCs with potable water (88.7 L) are also not cleared for use except for flushing.]*

ASU Toilet System Update: Detailed instructions were uplinked to the crew on the use of US HRF UCDs (Human Research Facility/Urine Collector Devices) with the Russian Wring Receptacle Assembly using a special adapter and RSQD (Rubber Stopper/Quick Disconnect). After the urine transfer, the Wring Receptacle will be connected to the EDV container for disposal. Wring collectors and UCDs are carried on STS-124, along with a replacement pump for the Russian ASU toilet system’s air/water separator (MNR-NS).

Weekly Science Update *(Expedition Seventeen -- Week 6)*

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Measurements continue in FGB module.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): In progress.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): The experiment platform continues to operate nominally, although the platform is rather cold due to unfavourable Beta angles. A DHPU (Data Handling Processing Unit) software patch is currently developed to fix the link error issues encountered with DEBIE-2 and FIPEX instruments. - DEBIE-2: Link error still under investigation; - DOSTEL: On-going science acquisition. Mode-2 (faster acquisition sampling rate) was used from 5/27 to 5/29; - EuTEMP: Currently inactive as planned; - EVC: Inactive, and could not be powered up due to very low temperature; - EXPOSE: On-going science acquisition; - FIPEX: A science acquisition script has run nominally until 5/26. On 5/28, a new script has been started almost nominally – there is a minor glitch with “fast measure” commands; - MEDET: Since 5/18, the instrument had to be switched off because it reached the low temperature limit. On 5/28, MEDET was powered back on is now acquiring science; - PLEGPAY: Instrument is powered on, but not in science acquisition mode; - TRIBOLAB: The POD#3 (Pin On Disk run#3) was restarted nominally on 5/17 and has been running nominally since then.

FSL (Fluid Science Laboratory): FSL MIL Bus cable repair was successfully performed on 5/5. After FSL Rack Activation from ground on 5/8, the ground confirmed that the FSL cables repair activities were successful. Further troubleshooting activities will be required with CEM-U (Upper) Optical Module.

GEOFLOW: Further troubleshooting activities with CEM-U (Upper) Optical Module are required. A new lamp set is manifested on STS-124/1J. GEOFLOW start is pending further FSL troubleshooting, and remaining commissioning activities (check of FSL optical modes). This will not occur prior to 1J flight.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Complete.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION w/REPOSITORY: Complete.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Inc16 samples have been downloaded with 15S and handed over to science team.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): “Garrett, thanks for completing your last Actiwatch Download/Initialization session. Your Sleep Actiwatch that you are wearing will be doffed and stowed on the Shuttle with the other Sleep subjects’ Actiwatches. Any additional sleep logging you perform between now and the Shuttle undocking is welcome. Thanks and enjoy the trip home.”

SOLAR (Solar Monitoring Observatory): The last Sun observation period has closed on 5/10. On 5/28, SOLAR was ground commanded to test its CPD (Coarse Pointing Device) and get additional telemetry from the end switches. The collected data will support investigation of the so-called “Zero-Procedure” anomaly. The next observation window will start on 6/3. - SOVIM: Waiting for the Sun; - SOLSPEC: Waiting for the Sun; - SOLACES: Waiting for the Sun.

SOLO: Planned.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

3-D SPACE : First session with Inc17 FE-2 is currently planned for 6/13.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): On 5/15, a caution signal was encountered with the BIOLAB Smoke Detector while activating BIOLAB from ground after the Reference ECs insertion to Rotor A crew activity. Engineering teams are analyzing the telemetry and are preparing a recovery plan. On 5/27, the BIOLAB Rotor B Locking Pin actuator was exchanged successfully by Garrett. After that, it was confirmed that the Rotor B (stuck since 1E Stage) can be manually rotated again. Unfortunately, BIOLAB could not be activated from the ground yet, pending resolution of the Smoke Detector issue. After the 1J flight, the remaining WAICO #1 ECs will be disposed of and replaced by six Reference ECs on Rotor B.

CEO (Crew Earth Observations): Through 5/22 the ground has received a total of 1,780 of ISS/

CEO images for review and cataloging. "No new imagery in response to our target list request was received this past week. We fully appreciate your demanding schedule in preparation for next week. Your interesting, high-oblique view of the southeastern Hawaiian Islands will be published in NASA/GSFC's Earth Observatory website this weekend. Your view illustrated the emission and spread of caustic, volcanic fog – known as *vog* – that occasionally plagues islanders. It also showed cloud formations that result from the impact of these isolated islands on the regional trade winds and local land/sea breezes. Very nice educational picture! We will resume CEO operations and reporting after STS-124."

CEO (Crew Earth Observation) photo targets uplinked for today were **Yellow River Delta, China** *(weather was predicted to be clear over this dynamic delta, which historically has changed its extent and morphology on almost a daily basis. ISS had a nadir pass over the center of the delta region. High-resolution imagery of the delta region was requested to map its current configuration),* and **Lake Nasser, Toshka Lakes, Egypt** *(looking to the left of track for the man-made Toshka Lakes, located to the west of Lake Nasser. Imagery of the current shorelines of the Lakes was requested in order to track changes in water level and extent)*.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 9:50am EDT [= epoch]):*
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Eccentricity -- 0.0005388
Solar Beta Angle -- 40.9 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 72 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54590

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
06/02/08 – FD3 - STS-124/Discovery/1J docking (1:54pm)

-- Preliminary STS-124 docked timeline:

- *6/03 – FD4 - EVA-1 (11:30am, 6.5 hrs.), OBSS transfer, JPM prep, S3/S4 SARJ TBA install, JPM install; Fossum/Garan (EV1/EV2)*
- *6/04 – FD5 - JPM Vestibule outfitting, Reisman/Chamitoff handovers*
- *6/05 – FD6 - EVA-2 (11:30am, 7 hrs), JPM outfit (JTVE install, JRMS cvr remv), S1 NTA prep, CP 9 ETVCG retrv*
- *6/06 – FD7 - JLP relocate to JPM; JLP Vestibule leak check; Focused inspection*
- *6/07 – FD8 - JLP Vestibule outfitting; CP9 ETVCG TVCIC R&R*
- *6/08 – FD9 - EVA-3 (10:30am, 7 hrs), S1 NTA R&R, compl JPM outfit (RMS cvr remv), P1 CP9 ETVCG install*
- *6/09 – FD10 - JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R*
- *6/10 – FD11 - Sayonara (~4:00pm), hatch close (~4:30pm)*
- *6/11 – FD12 - Undocking (~7:33am); Greg remains, Garrett leaves; OBSS survey/ inspection*

- *6/12 – FD13 - Mostly off-duty*
- *6/13 – FD14 - Stowing; deorbit preps*
- *6/14 – FD15 - Deorbit burn*

06/14/08 -- STS-124/Discovery landing (KSC: ~11:02am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking (at DC1 nadir)
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

Buzz Lightyear, hitching a ride on STS-124.

NASA

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 05/30/08
Date:	Friday, May 30, 2008 1:40:00 PM
Attachments:	

ISS On-Orbit Status 05/30/08

All ISS systems continue to function nominally, except those noted previously or below.

FE-2 Reisman conducted “Week 6” sampling of potable water for chemical and microbial analysis from the SVO-ZV tap and two SRV-K taps, the latter after preliminary heating of the water (four heating cycles) and flushing. *[Garrett collected three 450 mL samples (for postflight microbial analysis) and two 750 mL samples (for postflight chemical analysis) from each of three ports (SRV-K hot, SRV-K warm, SVO-ZV) for return on STS-124/1J. The small amounts of water used for flushing the equipment were later reclaimed from the flush bag.]*

CDR Volkov serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out" cycle to vacuum on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~5:15pm EDT. Filter bed #1 was regenerated yesterday. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods.]*

FE-1 Kononenko completed the troubleshooting of RS (Russian Segment) condensate processing, begun yesterday, removing the line-2 BRPK Condensate Separation & Pumping Unit of the SRVK-2M Multifiltration Kit, then installing it on line-1 to replace the failed BRPK-1 separator. The latter was discarded as trash and logged in the IMS (Inventory Management System). The BRPK is now processing US condensate.

Volkov performed maintenance on the #1 loop (KOB-1) of the Russian Thermal Control System (SOTR) in the Service Module (SM), using a manual pump, hose adapters and a pressure gauge (VK-316M). *[Purpose: to determine the volume of free air in KOB-1 and check the leak tightness of the KOB-1 accumulator bellows; also: to perform preventive maintenance on the SOTR loops’ solenoid valves.]*

Later, Sergey transferred US condensate, collected from the US CCAA (Common Cabin Air Assembly) air conditioner in a CWC (Contingency Water Container), to a Russian EDV container for processing as technical water for the Elektron oxygen (O_2) generator.

Kononenko meanwhile continued the current round of the monthly preventive maintenance of RS ventilation systems in the *Funktsionalnyi-Grusovoi Blok* (FGB), cleaning the grilles of its interior panels, the mesh screen of its central ventilation fan TsV1, and the detachable fan screens 1, 2, and 3 of the three SOTR gas-liquid heat exchangers (GZhT4) and the fixed grill of GZhT #4.

In the Lab, the FE-2 serviced the EMCS (European Modular Cultivation System). *[The periodic maintenance was performed in three steps: (1) replacing the water reservoir of Rotor A (#FM001) with a fresh reservoir (#FM005), replacing the RBLSS (Rotor Based Life Support System) module #FM008 on Rotor B with #FM004, closing the EMCS main door and verifying that all EMCS and EXPRESS locker switches are in the On position.]*

In the SM, Sergey completed the routine maintenance of the SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Oleg performed the daily IMS maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Garrett filled out the regular FFQ (Food Frequency Questionnaire), his tenth, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

In preparation for the EVA (Extravehicular Activities) prebreathe periods next week,

Reisman completed the periodic calibration of two CSA-O_2 (Compound Specific Analyzer-Oxygen sensor) instruments (#1041 & #1052), using a calibration tank with accurately known pressure (2100 psi).

Later, Reisman used the hand-held CDMK (Carbon Dioxide Monitoring Kit, #1002) to collect measurements for the regular atmospheric status check for ppCO_2 (Partial Pressure Carbon Dioxide) in the Lab, SM (at panel 449) and COL (Columbus Orbital Laboratory), and recording CO_2 readings and battery "ticks". *[Batteries were to be replaced if necessary. After all readings were taken, the CDM was deactivated and returned to its stowage place at LAB1S2.]*

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Reisman transferred the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

From their discretionary task suggestion list, CDR Volkov & FE-1 Kononenko were to perform more Progress 29P unloading & cargo transfers "as time permits", logging movements in the IMS.

Garrett Reisman had another hour set aside for more personal departure preparations.

Yesterday, the FE-2 replaced the failed LHA (Lamp Housing Assembly) in the US Airlock, using the last LHA spare on board.

At ~4:20am EDT, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU; *[Glavnaya operativnaya gruppa upravleniya = "Main Operative Control Group"]*), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~4:35am, Sergey & Oleg linked up with TsUP-Moscow stowage specialists via S-band to conduct the weekly IMS tagup, discussing stowage issues and equipment locations. *[Topics of the exchange included necessary ASU toilet repair/transfer updates in the IMS, recommended stowage locations for ASU components, confirmation of the new Sokol spacesuit's serial number, bagging & pre-packing of the zipper-damaged Sokol for return on the 1J Shuttle, etc.]*

At ~11:00am, Garrett Reisman held a CDE (Crew Discretionary Event) via S-band/ audio & Ku-band/video.

At ~3:00pm, the ISS crew is scheduled for their regular weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC (Station Support Computer)]*.

WDS Update: An updated Water Delivery System "cue card" was uplinked for the crew's reference. *[The new card (17-0002G) lists 35 CWCs (~1257.3 L total) for the four types of water identified on board: technical water (650.7 L, for Elektron, flushing, hygiene), potable water (534.8 L), condensate water (66 L), waste/EMU dump and other (5.8 L). Of the 35 containers, 12 CWCs with technical water (454.3 L) can only be used for flushing due to* Wautersia *bacteria contamination, and 2 CWCs with potable water (88.7 L) are also not cleared for use except for flushing.]*

STS-124/1J Launch: Preparations are progressing smoothly at KSC for tomorrow's launch of Discovery on Mission STS-124/1J. Weather outlook is "promising" for launch, with an 80 pct. chance of being favorable at launch time. 1J carries the **largest payload so far** to the ISS and is the second of three missions with components to complete the JAXA (Japan Aerospace Exploration Agency) JEM laboratory "Kibo" (Hope). Some highlights are:

- *Crewed by CDR Mark Kelly (IV- in suit), PLT Ken Ham (IV-tasks, Rob1/2), MS1 Karen Nyberg (Rob1), MS2 Ron Garan (EV2, Rob1/2), MS3 Mike Fossum (EV1, Rob1/2), MS4 Akihiko Hoshide (J1, JEM), & MS5 Greg Chamitoff (Exp 17);*
- *Starting 6/2 (FD2), wake/sleep cycle for the ISS crew will be shifted from 2:00am EDT to 6:32am. Since the early undock time on FD12 (7:33am) drives crew wakeup 2.5 hrs earlier, crew sleep will be shifted 30 min earlier each night starting FD7;*
- *JPM (Japanese Experiment Module Pressurized Module) will be installed at Node-2 on port on FD4, followed by an overnight leak check. JPM is launched with four racks (ECLSS/TCS-1, ECLSS/TCS-2, EPS-2, DMS-2) already installed; the remaining racks are already on orbit in the JLP (JEM Logistics Module);*
- *JLP will be transferred to the JPM zenith on FD7;*
- *Three EVAs (see below), with Reisman & Chamitoff in the A/L supporting EVA-1 campout;*
- *Reisman & Chamitoff's "generic" face-to-face handover time will be 16 hrs max;*
- *ISS will provide power to the Discovery via the SSPTS (Station-Shuttle Power Transfer System) from post-docking to just before undocking;*

- *Focused inspection of the Orbiter will be on FD7.*

CEO (Crew Earth Observation) photo targets uplinked for today were **Typhoon Nakri, Pacific Ocean** *(Dynamic Event. Looking to the right and ahead of track as ISS passed over the Philippines for this compact and powerful typhoon. Investigators suggested beginning the photography session using a 50 mm lens during approach to capture the entire storm system, then switching to the 800 mm for detailed images of the typhoon eye as ISS drew close to the storm),* **South Tibesti Megafans, Africa** *(the crew had a nadir pass through the center of this site. Looking for discontinuous and overlapping dry river channels as the signature of the megafans. Overlapping frames, taken along track, were requested),* and **Mt. Etna, Sicily** *(weather was predicted to be clear over this volcano at the time of the ISS overpass. The massive volcanic edifice of Mt. Etna is the largest in Italy, and the most historically active. High resolution, near-nadir imagery of the volcano's summit and flanks was requested)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:45am EDT [= epoch]):*
Mean altitude -- 340.1 km
Apogee height -- 343.7 km
Perigee height -- 336.5 km
Period -- 91.34 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005368
Solar Beta Angle -- 45.6 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 71 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54573

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/31/08 – STS-124/Discovery/1J launch – JEM PM (JPM) "Kibo", racks, RMS (5:02pm EDT nominal)
06/02/08 – FD3 - STS-124/Discovery/1J docking (1:49pm)

-- *Preliminary STS-124 docked timeline:*

- *6/03 – FD4 - EVA-1 (11:30am, 6.5 hrs.), OBSS transfer, JPM prep, S3/S4 SARJ TBA install, JPM install; Fossum/Garan (EV1/EV2)*
- *6/04 – FD5 - JPM Vestibule outfitting, Reisman/Chamitoff handovers*
- *6/05 – FD6 - EVA-2 (11:30am, 7 hrs), JPM outfit (JTVE install, JRMS cvr remv), S1 NTA prep, CP 9 ETVCG retrv*

- *6/06 – FD7 - JLP relocate to JPM; JLP Vestibule leak check; Focused inspection*
- *6/07 – FD8 - JLP Vestibule outfitting; CP9 ETVCG TVCIC R&R*
- *6/08 – FD9 - EVA-3 (10:30am, 7 hrs), S1 NTA R&R, compl JPM outfit (RMS cvr remv), P1 CP9 ETVCG install*
- *6/09 – FD10 - JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R*
- *6/10 – FD11 - Sayonara (~4:00pm), hatch close (~4:30pm)*
- *6/11 – FD12 - Undocking (~7:33am); Greg remains, Garrett leaves; OBSS survey/inspection*
- *6/12 – FD13 - Mostly off-duty*
- *6/13 – FD14 - Stowing; deorbit preps*
- *6/14 – FD15 - Deorbit burn*

06/14/08 -- STS-124/Discovery landing (KSC: ~11:02am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 05/29/08
Date:	Thursday, May 29, 2008 2:39:37 PM
Attachments:	

ISS On-Orbit Status 05/29/08

All ISS systems continue to function nominally, except those noted previously or below.

Upon wake-up, CDR Sergey Volkov terminated his third MBI-12 SONOKARD experiment session for the long-term Russian sleep study, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

Afterwards, the CDR conducted the periodic servicing of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The regen process will be terminated before sleeptime, at ~5:15pm EDT. Regeneration of bed #2 follows tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. The BMP's regeneration cycle is regularly done every 20 days.]*

FE-1 Oleg Kononenko supported the ground's activation of the Elektron O_2 generator at 32 amps by monitoring the external temperature of its secondary purification unit (BD) for the first 10 minutes of operations to ensure that there is no overheating. *[During nominal operations a gas analyzer is utilized to detect hydrogen (H_2) in the O_2 line (which could cause overheating) but is not included in the control algorithm until 10 minutes after Elektron startup.]*

FE-2 Garrett Reisman conducted the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week. Three empty CWCs (#1039, #1079, #10650) were moved from Node-1 to a mesh bag in the Lab with other pre-gathered CWCs for fill-up during 1J.]*

In the JLP (JEM Logistics Module Pressurized Section), the FE-2 continued JTVE (JEM TV Camera Equipment) installation preparations, today completing the work on the second set, i.e., gathering components, configuring the second boom for camera installation and returning everything to stowage. *[Assembly of the Forward & Aft JTVE booms and cameras involved rack rotation in the JLP for boom removal, followed later by pre-1J boom assembly including MLI (Multi-Layer Insulation) cover retrieval & installation, and installation of each camera onto its launch lock bolt. After the external JTVE installation by the spacewalkers, the ground will perform a checkout on each of them.]*

Also in the JLP, the FE-2 repositioned the front bracket of the DMS1 rack to eliminate future interference with the rack's fire port. *[This task was deferred from yesterday.]*

Working on the Russian BVS computer system, Volkov first upgraded the RSK1 laptop with new software (Vers. 1.4) from a DVD running on the RSE1 machine. *[The upgrade includes the software for the new Neurolab experiment (NEURON32), an update for the SIGMA ballistics routine, etc.]*

Later, Sergey replaced the RS3 laptop with the RS1 laptop for the KTsP1 (CPC1, Central Post Computer #1), while RS2 continued supporting nominal operations by the KTsP2 (CPC2).

After removing an EDV container-full of water from the ATV "Jules Verne" to check out this WDS (Water Delivery System) function, Kononenko continued setting up for more transfer of US condensate water to empty ATV
WDS tanks, today first checking the hermeticity of the cargo ship's WCP2 tank bladder with a pump for one hour, then configuring the transfer gear. *[The WCP3 tank was filled on 5/26 with ~88 liters. WCP1 contains potable water.]*

Reisman used the electronic Velocicalc instrument to take THC IMV (Temperature & Humidity Control/Intermodule Ventilation) air flow measurements of relative humidity (dew point, wet bulb temp), temperature and velocity (flow rate) of the air from Node-1 Stbd Aft and Node-2 Overhead Port locations. *[Today's activity was to retake the measurements collected by Garrett on 5/7, as a double-check (or*

correction) for the ground of some unexpected results, in order to verify good IMV flow during 1J next week.]

In the Soyuz TMA-12/16S spacecraft, docked at the DC1 Docking Compartment, Volkov turned off the spacecraft's gas analyzer (GA) which he had activated on 5/26. *[Monitoring the atmosphere of the CRV (Crew Return Vehicle) with the GA is a periodic procedure.]*

The FE-2 prepared the POC-DOUG (Portable Onboard Computers/Dynamic Onboard Ubiquitous Graphics) application with a new software load for the upcoming 1J Robotics activities and verified correct function of the system. *[DOUG is a special application running on the MSS (Mobile Service System) RWS laptops that provides a graphical birdseye-view image of the external station configuration and the SSRMS (Space Station Remote Manipulator System), showing its real-time location and configuration on a laptop during its operation. During 1J, the SSRMS will be used on FD4 for the OBSS (Orbiter Boom Sensor System) transfer & JPM installation, on FD6 for JPM grapple release & walkoff, on FD7 for Node-2 release, Focused Inspection support, & JLP relocation, on FD8 to maneuver to EVA-3 start position, on FD9 for NTA (Nitrogen Tank Assembly) R&R & JEM RMS deployment video support, and on FD8/FD10 for video support of JEM RMS deployment.]*

Afterwards, Garrett performed the periodic battery check and reboot of all active US PCS (Portable Computer System) and COL PWS (Columbus Orbital Laboratory/ Portable Workstation) laptops, a once-a-month activity.

The crew conducted a joint 1-hr timeline review of the upcoming STS-124/1J EVAs, followed by a tagup/teleconference with ground specialists at ~10:55am EDT. *[Timeline overview see below. The EVAs will be performed by Mike Fossum (EV1) & Ron Garan (EV2). EVA prep & prebreathe support will be provided during the three EVAs by Chamitoff, Reisman & Volkov, while Shuttle PLT Ken Ham serves as IV crewmember.]*

Later, the FE-2 continued EVA preparations in the Airlock (A/L) deferred from 5/23. *[Garrett "de-gassed" PWRs (Payload Water Reservoirs) #1007 & #1023 and returning them to stowage in the EL (Equipment Lock). "De-gassing" = removing air bubbles from the PWR water that will be used to refill the EMU water tanks, by centripetal force, i.e., swinging to produce temporary "artificial gravity".]*

Continuing the current round of periodic preventive maintenance of RS (Russian Segment) ventilation systems, Sergey spent ~50 min. in the DC1 (Docking Compartment), cleaning the PF1,2 dust collector cartridges and V1 & V2 ventilator grilles.

The CDR completed the routine maintenance of the SM's SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Oleg performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Garrett Reisman had another hour set aside for more personal departure preparations.

At ~2:20pm EDT, Volkov & Reisman linked up with ground specialists at MCC-H for a 15-min debrief to discuss the images downlinked from their recent (5/26) Shuttle RPM (R-bar Pitch Maneuver) skill training. *[The skill training prepares the crew for the bottom-side mapping of the Discovery upon its arrival on 6/2. During the RPM at ~600 ft from the station, the ISS crew will have only ~90 seconds for taking high-resolution digital photographs of all tile areas and door seals on the Orbiter, to be downlinked for launch debris assessment. Thus, time available for the shooting will be very limited, requiring great coordination between the two headset-equipped photographers and the Shuttle.]*

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-1), TVIS treadmill (CDR, FE-1, FE-2), and RED resistive exercise device (CDR, FE-1, FE-2).

Afterwards, Kononenko transferred the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~3:47pm, FE-2 Reisman is scheduled for his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop),

ASU Toilet System Update: At KSC, the replacement pump for the Russian ASU toilet system's air/water separator (MNR-NS) and a supply of wring collectors were stowed this morning on STS-124/Discovery. RSC-Energia/Moscow has scheduled

the R&R (removal & replacement) on 6/4.

CEO (Crew Earth Observation) photo target uplinked for today was **Mt. Kilimanjaro, Kenya** *(looking to the right of track for Mount Kilimanjaro, one of Africa's most famous volcanoes. There was probably cloud cover surrounding the volcano, but the upper slopes and peak are usually visible above the clouds. Photography of summit glaciers, snow cover, and dark lava flows was requested),* **Lake Nasser, Toshka Lakes, Egypt** *(weather was predicted to be clear over the man-made Toshka Lakes. Looking to the left of track for the Lakes, which are located to the west of Lake Nasser. Imagery of the Toshka Lakes was requested to track water level and shoreline changes),* and **Lake Poopo, Bolivia** *(looking to the right of track for this large saline lake located to the west of the Andes Mountains. The white expanse of Salar de Uyuni – the world's largest salt flat – should have been visible to the SW of Lake Poopo. Imagery of Lake Poopo's shorelines is useful to track changes in water level resulting from regional changes in precipitation)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:24am EDT [= epoch]):*
Mean altitude -- 340.2 km
Apogee height -- 343.8 km
Perigee height -- 336.7 km
Period -- 91.34 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005288
Solar Beta Angle -- 50.3 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 42 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54557

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/31/08 – STS-124/Discovery/1J launch – JEM PM (JPM) "Kibo", racks, RMS (5:02pm EDT nominal)
06/02/08 – FD3 - STS-124/Discovery/1J docking (1:49pm)

-- *Preliminary STS-124 docked timeline:*

- *6/03 – FD4 - EVA-1 (11:30am, 6.5 hrs.), OBSS transfer, JPM prep, S3/S4 SARJ TBA install, JPM install; Fossum/Garan (EV1/EV2)*
- *6/04 – FD5 - JPM Vestibule outfitting, Reisman/Chamitoff handovers*
- *6/05 – FD6 - EVA-2 (11:30am, 7 hrs), JPM outfit (JTVE install, JRMS*

cvr remv), S1 NTA prep, CP 9 ETVCG retrv

- *6/06 – FD7 - JLP relocate to JPM; JLP Vestibule leak check; Focused inspection*
- *6/07 – FD8 - JLP Vestibule outfitting; CP9 ETVCG TVCIC R&R*
- *6/08 – FD9 - EVA-3 (10:30am, 7 hrs), S1 NTA R&R, compl JPM outfit (RMS cvr remv), P1 CP9 ETVCG install*
- *6/09 – FD10 - JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R*
- *6/10 – FD11 - Sayonara (~4:00pm), hatch close (~4:30pm)*
- *6/11 – FD12 - Undocking (~7:33am); Greg remains, Garrett leaves; OBSS survey/inspection*
- *6/12 – FD13 - Mostly off-duty*
- *6/13 – FD14 - Stowing; deorbit preps*
- *6/14 – FD15 - Deorbit burn*

06/14/08 -- STS-124/Discovery landing (KSC: ~11:02am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/12/08 -- STS-126/Endeavour/ULF2 docking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)

2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 05/28/08
Date:	Wednesday, May 28, 2008 2:35:27 PM
Attachments:	

ISS On-Orbit Status 05/28/08

All ISS systems continue to function nominally, except those noted previously or below.

For the long-term Russian sleep study, FE-1 Oleg Kononenko terminated his third MBI-12 SONOKARD experiment session upon wake-up by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. CDR Sergey Volkov in turn will start his third overnight MBI-12 session tonight. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

To provide cooling for the ground-commanded activation of the U.S. CDRA (Carbon Dioxide Removal Assembly), FE-2 Reisman connected the regular ITCS LTL (Internal Thermal Control System/Low Temperature Loop) coolant jumper connection to the LAB1D6 rack. *[CDRA was activated today at 4:15am-4:45am EDT to reduce cabin CO_2 levels.]*

After CDR Volkov set up the NOA/Nitric Oxide Analyzer (MBI-21) experiment, he and Kononenko completed a data take session (his second, Oleg's first), later filling in the electronic log book on the RSE1 laptop for downlink and restowing the hardware. Each subject took two NO (Nitric Oxide) measurements in exhaled air. *[Purpose of the ESA experiment ESANO1, consisting of the "Platon" analyzer and its power supply, is to monitor expired NO in the subject's exhaled air to detect signs of airway inflammation and indications of venous gas emboli (bubbles) that*

may be caused by inhalation of pollutants in the closed environment of the ISS cabin and increased risk of decompression sickness.]

FE-2 Reisman made further preparations for the arrival of the JPM (Japanese Experiment Module Pressurized Module) next week by attaching the JTVE (JEM TV Camera Equipment) on the boom and returning it to stowage. *[For his work in the JLP (JEM Logistics Module Pressurized Section), Garrett briefly activated the JLP MKAM (Minimum Keep-Alive Monitor) fan and temporarily moved the JLP's PBA (Portable Breathing Apparatus) from its location COL1PF in the COL (Columbus Orbital Laboratory) to the JLP endcone (JLP1F3). Afterwards, Garrett deactivated the JLP MKAM fan and returned the PBA to its COL location.]*

Also in the JLP, the FE-2 repositioned the front bracket of the DMS1 rack to eliminate future interference with the rack's fire port.

Starting a new round of preventive ventilation system maintenance in the Russian Segment (RS), Volkov cleaned Group A fan screens in the Service Module (SM) and inspected equipment & structural elements in the maintenance areas to check for residue & condensate, taking photographs of the latter if found, for subsequent downlink.

Reisman meanwhile performed the periodic 5-min checkup on active U.S. payloads, i.e., cleaning the ANITA (Analyzing Interferometer for Ambient Air) inlet plus inspecting and filter cleaning of the CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) incubator payload. *[The CGBA incubator is controlled from the ground, with automatic video downlinked to Earth. ANITA monitors low levels of potential gaseous contaminants in the ISS cabin atmosphere with a capability of simultaneously monitoring 32 gaseous contaminants. The experiment is testing the accuracy and reliability of this technology as a potential next-generation atmosphere trace-gas monitoring system for ISS and future spacecraft. This is a cooperative investigation with ESA.]*

The CDR completed the routine maintenance of the SM's SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

As part of the ECLSS servicing, Sergey also performed the periodic functional check of the IP-1 airflow sensors in the various RS hatchways. *[The inspection includes the passageways PrK (SM Transfer Compartment)–ATV, PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB*

PGO, FGB PGO–FGB GA, FGB GA–Node-1.]

FE-1 Kononenko ran a standard checkout/test on the AST spectrometer of the Matryoshka-R (RBO-3) radiation payload on FGB panel 429 and its ALC-948 memory card, using the RSK-1 laptop. *[Purpose of the test was to ascertain the continued usability of the 948 memory card and the AST at its FGB location. RBO-3 has taken over the former ESA/RSC-Energia experiment ALC (ALTCRISS/Alteino Long Term monitoring of Cosmic Rays on the ISS) with its AST Spectrometer and ALC equipment.]*

In preparation for the subsequent R&R (removal & replacement) of the BSV-M Master Clock unit in the SM, Kononenko switched the Russian Vozdukh CO_2 removal system to automated mode on both beds. After the R&R, the system was returned to manual Mode 5 via the on-board computer system. *[Mode 5 uses 2 adsorbent cartridges with 10 min cycle time, a vacuum pump cycle time of 1 min, plus 40% airflow during sleep, 60-80% during the day, and 100% during physical exercise, for 3-4 crewmembers.]*

The R&R, by Oleg, of one (A1) of the two redundant BSV-M (Frequency & Time Synchronization System, i.e., Master Clock) units has been pending since last December, awaiting the arrival of a new BSV-MA1 unit on the last Progress cargo ship. After the installation of the new clock unit (with the BITS2-12 Onboard Telemetry Measurement System turned off), the clock was activated on TsUP Go and adjusted manually. Upon nominal operation, Vozdukh was to be switched back to manual mode. *[BSV-M A1 is needed for nominal operation with the payload server which had temporarily been switched to BSV-M A2 by FE-1 Malenchenko on 12/23.]*

Later, with the IK0501 GA (Gas Analyzer) of the SOGS Pressure Control & Atmospheric Monitoring System deactivated, Sergey Volkov installed and connected a new BKS (Onboard Cable Network) telemetry cable harness between the IK0501 and the BITS2-12.

Volkov completed the periodic (about twice a month) replenishing of the Elektron oxygen generator's water supply for electrolysis, filling the KOV EDV container with water collected in CWC (Contingency Water Container) #1050 from the Lab CCAA (Common Cabin Air Assembly) dehumidifier. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron shutdown.]*

Garrett conducted the periodic offloading of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water

Container, #1054) with the collected water slated for processing. No samples were required this time. *[Estimated offload time before reaching the tank's neutral point (leaving ~6 kg in the tank): ~20 min.]*

During the untended filling process, Reisman had 30 min reserved for personal departure preparations.

Garrett also had an additional hour set aside for more equipment prepacking for return on the Shuttle.

The FE-2 activated the SAMS ICU (Space Acceleration Measurement System Interim Control Unit) in its Drawer 1 in the LAP2 Rack. *[SAMS measures structural dynamics (vibrational) data.]*

In preparation for the upcoming STS-124 spacewalks, the two Flight Engineers spent time in the US Airlock checking out three PGTs (Pistol Grip Tools, #1001, #1005, #1008), including inspection of their collars and also two SAFER (Simplified Aid for EVA Rescue) units (#1004 & #1007.)

CDR Volkov meanwhile had ~2 hrs set aside for continuing the annual inspection and photo-documentation of window panes in the SM, started earlier (5/14). The observed defects were recorded in image and text files on the RSK1 laptop for subsequent downlink via U.S. OCA assets. *[Objective of the inspection, which uses a digital still camera (Nikon D1X w/SB-28DX flash) and voice recorder, was to assess the pane surfaces on SM windows 6, 7, 8, 12, and EV hatch VP2 for any changes (new cavities, scratches, new or expanded old stains or discolorations affecting transparency properties) since the last inspection, performed by Oleg Kotov on 6/26/07. The new assessment will be compared to the earlier observations. Defects are measured with the parallax method which uses eyeball-sighting with a ruler and a right isosceles triangle to determine the defects' size and position with respect to the window's internal surface (parallax being the apparent change in an object's position resulting from changing the observer's position).]*

Garrett retrieved two EGSAs (Element Ground Strap Assemblies) from their stowage bag for relocation to a JPM/JLP-designated bag in Node-2.

Also in Node-2, Reisman uninstalled and removed a failed RFCA (Rack Flow Control Assembly) of the ITCS (Internal Thermal Control System). During the 1J docked period, an accumulator from one of the JEM racks is to be installed in its place, and the failed RFCA will be returned.

Oleg performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular

weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Working on the MELFI (Minus Eighty Degree Laboratory Freezer for the ISS), Reisman moved the Japanese CW/RW (Cell Wall/Resist Wall) KFT kits with their harvested RNA samples from the +2C dewar to a -95C dewar.

From their discretionary "time permitting" task list, CDR Volkov & FE-1 Kononenko performed more Progress 29P unloading & cargo transfers, logging movements in the IMS.

Garrett completed the periodic (monthly) inspection of the RED (Resistive Exercise Device) canister cords and accessories.

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR).

Afterwards, Reisman transferred the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~10:00am EDT, the ISS crew held its weekly teleconference with ISS Program Management at JSC/Houston via Private S/G2, S-band/audio.

At ~4:40pm, FE-2 Reisman is scheduled for his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop),

ATV Water Transfer Update: The amount of US condensate water transferred to the ATV "Jules Verne" tanks from 4 EDV containers was about 88 liters

CEO (Crew Earth Observation) photo target uplinked for today was **South Tibesti Megafans, Chad** *(ISS had a nadir pass over the Tibesti megafans of Chad. Looking for discontinuous and overlapping stream channels - interpreted to be the result of shifting river courses in the region during a wetter climate [approximately 8000 years ago]. Overlapping frames, taken along track, were requested).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:36am EDT [= epoch]):*
Mean altitude -- 340.2 km
Apogee height -- 343.9 km
Perigee height -- 336.6 km
Period -- 91.34 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005462
Solar Beta Angle -- 54.9 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 40 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54542

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/31/08 – STS-124/Discovery/1J launch – JEM PM (JPM) "Kibo", racks, RMS (5:02pm EDT nominal)
06/02/08 – FD3 - STS-124/Discovery/1J docking (1:49pm)

-- *Tentative STS-124 docked timeline:*

- *6/03 – FD4 - EVA-1 (11:30am, 6.5 hrs.), OBSS transfer, JPM prep, S3/S4 SARJ TBA install, JPM install*
- *6/04 – FD5 - JPM Vestibule outfitting, Reisman/Chamitoff handovers*
- *6/05 – FD6 - EVA-2 (11:30am, 6.5 hrs), JPM outfit (JTVE install, JRMS cvr remv), S1 NTA prep, CP 9 ETVCG retrv*
- *6/06 – FD7 - JLP relocate to JPM; JLP Vestibule leak check; Focused inspection*
- *6/07 – FD8 - JLP Vestibule outfitting; CP9 ETVCG TVCIC R&R*
- *6/08 – FD9 - EVA-3 (10:30am, 6.3 hrs), S1 NTA R&R, compl JPM outfit (RMS cvr remv), P1 CP9 ETVCG install*
- *6/09 – FD10 - JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R*
- *6/10 – FD11 - Sayonara (~4:00pm), hatch close (~4:30pm)*
- *6/11 – FD12 - Undocking (~7:33am); Greg remains, Garrett leaves; OBSS survey/inspection*
- *6/12 – FD13 - Mostly off-duty*
- *6/13 – FD14 - Stowing; deorbit preps*
- *6/14 – FD15 - Deorbit burn*

06/14/08 -- STS-124/Discovery landing (KSC: ~11:02am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking

10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 05/27/08
Date:	Tuesday, May 27, 2008 1:46:29 PM
Attachments:	

ISS On-Orbit Status 05/27/08

All ISS systems continue to function nominally, except those noted previously or below.

FE-2 Garrett Reisman continued activities in the COL (Columbus Orbital Laboratory), today replacing a failed locking actuator on BLB (Biolab) and taking detailed photos of the bellows & shutter above rotor A.

Later, Reisman deactivated the COL EDR (European Drawer Rack) and PCDF EU (Protein Crystallization Diagnostic Facility Electronic Unit), concluding with some close-up imaging using the COL's VCA1 (Video Camera Assembly 1).

In preparation for the subsequent VSPLESK installation (which required turning off the BITS2-12 Onboard Telemetry Measurement System), FE-1 Kononenko supported TsUP-Moscow in deactivating the Elektron O_2 generator. As part of the standard deactivation process the Elektron was purged with N_2 (nitrogen), controlled from laptop. *[Elektron will be reactivated on 5/29.]*

Afterwards, Kononenko and CDR Volkov had several hours for routing, installing and connecting SBI (Onboard Measurement System) control cables for the new VSPLESK ("Burst") payload, behind wall panels in the Service Module (SM). The BITS2-12 was then reactivated to allow ground checkout of the outfitting. *[VSPLESK, along with the BTN-M1 "NEUTRON" science payload, will create a physical model of charged and neutral particles generated during solar bursts and of the neutron albedo of the Earth atmosphere considering solar and geophysical aspects.]*

After deactivating the MedOps cardiac defibrillator at the HRF1 (Human Research Facility 1) rack, the CDR performed its periodic checkout, which was to be recorded on video and later dumped to the ground (last time done: 3/24/08). *[This routine*

maintenance task is scheduled as soon as possible from Expedition start and every 60 days thereafter. For the checkout, the defib is connected to the 120V outlet, equipped with its battery (#1021) and then allowed to charge, for about five seconds, to a preset energy level (e.g., 100 joules). After the button-triggered discharge, a console indicator signals success or failure of the test. The pacing signal is downlinked via S-band for 1 min. The HRF was powered down afterwards.]

Sergey Volkov also conducted the periodic data transfer and time synchronization between the RSS1 and the BSPN payload server, after testing functionality by checking data comm between the two computers and synching RSS1 to station time, in support of payload data transfers from the BSPN for subsequent downlink on OCA comm (via the Russian RSS1 laptop to a PCMCIA flash card). The transfer pertained to a parameter table that was copied from BSPN into the RBO-3-3 Matryoshka radiation hardware. *[Before RSS1/BSPN synchronization, the RSS1 is updated with the exact time as per the station clock (which in turn is synchronized daily from RGS/Russian Ground Site). Experiment control application is a payload file transfer program called ShellForKE.]*

Garrett Reisman undertook the monthly FDS PEP (Fire Detection & Suppression/ Portable Emergency Provisions) safety inspection/audit in the ISS modules. *[The JLP (Japanese Experiment Module Experiment Logistics Module Pressurized Section) contains only a PFE (Portable Fire Extinguisher). The US Airlock holds 2 PHA QDMAs (Prebreathe Hose Assembly/Quick-Don Mask Assemblies). The IMS (Inventory Management System)-supported inspection involves verification that PFEs, PBAs (Portable Breathing Apparatus), QDMAs and EHTKs (Extension Hose/ Tee Kits) are free of damage to ensure their functionality, and to track shelf life/life cycles on the hardware (QDMA harness inspection was not required this time).]*

In the SM, Volkov took the periodic readings of potentially harmful atmospheric contaminants with the CMS (Countermeasure System) component of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite which uses preprogrammed microchips to measure H_2CO (Formaldehyde, methanal), CO (Carbon Monoxide) and NH_3 (Ammonia), taking one measurement per microchip. *[CMS is a subsystem of the Russian SKDS Pressure Control & Atmosphere Monitoring System.]*

Later, the CDR also spent time with the GANK-4M system of the SM pressure control & atmospheric monitoring system (SOGS), adjusting a measurement coefficient ("Coefficient B") and taking atmospheric readings. *[GANK tests for Methane (CH_4), NH_3, CO, H_2CO, Nitrogen Oxides (NO, NO_2), Hydrogen Chloride (HCl), Hydrogen Fluoride (HF), and Hydrogen Cyanide (HCN).]*

The crew had an hour reserved for reviewing the uplinked flight plan overview of STS-124/1J joint activities next week. Afterwards, they linked up with the ground to discuss the timeline. Some highlights follow:

- *STS-124/1J/Discovery will be crewed by CDR Mark Kelly (IV-suit), PLT Ken Ham (IV-tasks, Rob1/2), MS1 Karen Nyberg (Rob1), MS2 Ron Garan (EV2, Rob1/2), MS3 Mike Fossum (EV1, Rob1/2), MS4 Aki Hoshide (J1, JEM), & MS5 Greg Chamitoff (Exp 17);*
- *ISS wake/sleep cycle will be shifted from 2:00am EDT to 6:32am on FD2 (6/2). Since the early undock time on FD12 (7:33am) drives crew wakeup 2.5 hrs earlier, crew sleep will be shifted 30 min earlier each night starting FD7;*
- *The JPM (Japanese Experiment Module Pressurized Module) will be installed at Node-2 on port on FD4, followed by an overnight leak check. It is launched with four racks (ECLSS/TCS-1, ECLSS/TCS-2, EPS-2, DMS-2) already installed; the remaining racks are already on orbit in the JLP;*
- *The JLP will be transferred to the JPM zenith on FD7;*
- *There will be three EVAs (see below), with Garrett & Greg in the A/L supporting EVA-1 campout;*
- *Generic face-to-face handover time between Reisman & Chamitoff will be 16 hrs max;*
- *Discovery will be powered by the SSPTS (Station-Shuttle Power Transfer System) from post-docking to just before undocking;*
- *Focused inspection of the Orbiter will be on FD7.]*

The three crewmembers had their regular periodic PMCs (Private Medical Conferences) via S- & Ku-band audio/video, Sergey at ~9:45am, Oleg at ~10:00am, Garrett at ~1:30pm.

Garrett Reisman conducted the regular 45-min OBT (Onboard Training) session for supporting CBM (Common Berthing Mechanism) capture/ABOLT activities on 6/3 during the JPM berthing at the Node-2 Port hatch.

The CDR completed the routine maintenance of the SM's SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Sergey also performed the daily IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/ import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-1, FE-2), TVIS treadmill (CDR, FE-1), and RED resistive exercise device (CDR, FE-1, FE-2).

Afterwards, Volkov transferred the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Reisman had another hour set aside for his departure preparations.

At ~5:20pm, just before sleep time, Oleg will again set up the Russian MBI-12 SONOKARD (Sonocard) payload and start his third experiment session, using a sports shirt from the SONOKARD kit with a special device in the pocket for testing a new method for acquiring physiological data without using direct contact on the skin. Measurements are recorded on a data card for return to Earth. Sergey will start his third MBI-12 session tomorrow evening. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

ASU Update: Troubleshooting continues on the Russian ASU toilet facility. Almost all system components have been changed out at this time, including the separator with no improvement in function. Specialists feel the problem is with the separator pump, though they have never before seen this failure signature. New procedures for temporary manual operation of the pump are in work, and the crew is using a backup system of wring collectors which are functioning nominally. Since they are a consumable, 1J is being last-minute manifested with additional wring collectors and a new ASU separator pump (KSC ground unit).

SM Condensate Processing Update: SM condensate processing troubleshooting continues. SM pressure sensor checkout for the condensate line was successful, as was the installation of a new condensate transfer unit for the SRVK (Multifiltration Unit). Condensate transfer still not working because of BRPK (Condensate Separation & Pumping Unit) failure. Russian teams are still assessing.

No CEO (Crew Earth Observations) targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:14am EDT [= epoch]):*
Mean altitude -- 340.3 km
Apogee height -- 343.9 km
Perigee height -- 336.6 km
Period -- 91.34 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005442
Solar Beta Angle -- 59.8 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 60 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54526

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/31/08 – STS-124/Discovery/1J launch – JEM PM (JPM) "Kibo", racks, RMS (5:02pm EDT nominal)
06/02/08 – FD3 - STS-124/Discovery/1J docking (1:49pm)

Tentative STS-124 docked working timeline:

- *6/03 – FD4 - EVA-1 (11:30am, 6.5 hrs.), OBSS transfer, JPM prep, S3/S4 SARJ TBA install, JPM install*
- *6/04 – FD5 - JPM Vestibule outfitting, Reisman/Chamitoff handovers*
- *6/05 – FD6 - EVA-2 (11:30am, 6.5 hrs), JPM outfit (JTVE install, JRMS cvr remv), S1 NTA prep, CP 9 ETVCG retrv*
- *6/06 – FD7 - JLP relocate to JPM; JLP Vestibule leak check; Focused inspection*
- *6/07 – FD8 - JLP Vestibule outfitting; CP9 ETVCG TVCIC R&R*
- *6/08 – FD9 - EVA-3 (10:30am, 6.3 hrs), S1 NTA R&R, compl JPM outfit (RMS cvr remv), P1 CP9 ETVCG install*
- *6/09 – FD10 - JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R*
- *6/10 – FD11 - Sayonara (~4:00pm), hatch close (~4:30pm)*
- *6/11 – FD12 - Undocking (~7:33am); Greg remains, Garrett leaves; OBSS survey/inspection*
- *6/12 – FD13 - Mostly off-duty*
- *6/13 – FD14 - Stowing; deorbit preps*
- *6/14 – FD15 - Deorbit burn*

06/14/08 -- STS-124/Discovery landing (KSC: ~11:02am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 undocking

09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-65/30P launch
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10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 05/26/08
Date:	Monday, May 26, 2008 5:35:17 PM
Attachments:	

ISS On-Orbit Status 05/26/08

All ISS systems continue to function nominally, except those noted previously or below. *US Holiday: Memorial Day. Ahead: Week 6 of Increment 17.*

FE-2 Garrett Reisman worked on the EDR (European Drawer Rack) in the COL (Columbus Orbital Laboratory), installing a restraint on the EDR seat track for the PCDF EU (Protein Crystallization Diagnostic Facility Electronic Unit). Later, the PCDF EU was activated by the ground with crew support.

Afterwards, Reisman performed the periodical status and shell temperature check In the JLP (Japanese Experiment Module Experiment Logistics Module Pressurized Section) from the MKAM (Minimum Keep-Alive Monitor).

The CDR performed major 1.5-hour IFM (in-flight maintenance) in the Service Module (SM) by removing one of the module's eight 800A storage batteries (#3) and replacing it with a spare Blok 800A. The removed unit was prepared for disposal on the next Progress. *[The ZRU charge/discharge unit #3 was deactivated by TsUP/Moscow beforehand and later reactivated. The new battery #3 is currently being conditioned in Cycle mode. This restores the full set of eight SM batteries to operation.]*

FE-1 Oleg Kononenko conducted the long-planned transfer of US condensate water from four CWCs (Contingency Water Containers) to the empty WCP3 tank of the ATV (Automated Transfer Vehicle)'s water delivery system (WDS), first assembling the equipment with a pump for purging from the tank and conducting standard leak checking for one hour, then activating the transfer. *[The WCP1 tank contains potable water. ATV water tank #2 integrity check is scheduled for 5/29.]*

Reisman set up the SLEEP experiment for end-of-increment Actiwatch downloading and initializing, then marked his Actiwatch and stowed it. *[The NASA/JSC experiment is supported by the HRF1 laptop. To monitor the crewmembers' sleep/*

wake patterns and light exposure, their special Actiwatch device measure the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition.]

Volkov & Kononenko spent about three hours working jointly on cargo transfers & stowage from Progress 29P, tracking the moves in the IMS (Inventory Management System).

Reisman had two hours for unpacking and stowing US cargo items delivered on 29P, as per the 29P Unpack List.

Sergey & Garrett performed their third standard 30-min Shuttle RPM (R-bar Pitch Maneuver) skill training, using the DCS-760 digital still cameras with 400 & 800mm lenses to take in-cabin target imagery. Afterwards, the obtained OBT (onboard training) images were downlinked to the ground for analysis (~11:45am). *[The RPM drill prepares crewmembers for the bottom-side mapping of the Orbiter at the arrival of the Shuttle (STS-124/1J) on 6/2. During the RPM at ~600 ft from the station, the "shooters" have only ~90 seconds for taking high-resolution digital photographs of all tile areas and door seals on Discovery, to be downlinked for launch debris assessment. Thus, time available for the shooting will be very limited, requiring great coordination between the two headset-equipped photographers and the Shuttle pilot.]*

Also in preparation for the RPM photo shoot, the FE-2 checked out all four DCS (Digital Camera System) cameras by taking blank images, storing them on a PCMCIA flash memory card and later downlinking them to MCC-Houston for analysis. *[Blank images are used to identify "dead" pixels for each camera.]*

In the Soyuz TMA-12/16S spacecraft, docked at the DC1 Docking Compartment, Volkov turned on the spacecraft's gas analyzer (GA), a periodic procedure to monitor the atmosphere of the CRV (Crew Return Vehicle).

Performing some outfitting in the SM, the CDR installed a Progress-delivered protective cover on the PPS-31 Systems Power Panel of the SUBA Onboard Equipment Control System.

The FE-2 had another hour set aside for his departure preparations.

The CDR completed the routine maintenance of the SM's SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the*

Lab humidifier.]

Oleg also performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

Afterwards, Kononenko transferred the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~4:55am EDT, Garrett conducted a 15-min teleconference with ground specialists to discuss JLP stowage issues.

At ~10:30am, the CDR & FE-1 downlinked a Russian PAO TV message of greetings to TsUP-Moscow for the participants of the Star Relay Race Competition

At 1:30pm, Volkov & Kononenko held a regular PMC (Private Medical Conference) to discuss their physical exercise with a specialist via Ku- & S-band.

No CEO (Crew Earth Observations) targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:02pm EDT nominal)
06/02/08 -- STS-124/Discovery/1J docking (1:49pm)

Tentative STS-124 docked working timeline:

- *6/03 -- EVA-1 (11:30am, 6.5 hrs.), OBSS transfer, JPM prep, S3/S4 SARJ TBA install, JPM install*
- *6/04 -- JPM Vestibule outfitting, Reisman/Chamitoff handovers*
- *6/05 -- EVA-2 (11:30am, 6.5 hrs), JTVE install, JRMS cvr remv, NTA prep, CP 9 ETVCG retrv*

- *6/06 -- JLP relocate to JPM; JLP Vestibule leak check*
- *6/07 -- JLP Vestibule outfitting*
- *6/08 -- EVA-3 (10:30am, 6.3 hrs), S1 NTA install, CP9 ETVCG install, JRMS cover remove*
- *6/09 -- JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R*
- *6/10 -- Sayonara (~4:00pm), hatch close (~4:30pm)*
- *6/11 -- Undocking (~9:04am); OBSS survey/inspection*
- *6/12 -- Mostly off-duty*
- *6/13 -- Stowing; deorbit preps*
- *6/14 -- Deorbit burn (~9:56am);*

06/14/08 -- STS-124/Discovery landing (KSC: ~10:59am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-65/30P launch
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4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

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http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 05/25/08
Date:	Sunday, May 25, 2008 2:16:00 PM
Attachments:	

ISS On-Orbit Status 05/25/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – crew off duty. Ahead: Week 6 of Increment 17.*

The CDR conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Sergey also gathered weekly data on Total Operating Time & "On" durations of the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem for reporting to TsUP.

At ~10:30am EDT, FE-2 Garrett Reisman had his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop),

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2) and resistive exercise device (CDR, FE-1, FE-2).

Working off his discretionary "time permitting" task list, Oleg had his fourth run with the Russian DZZ-2 "Diatomeya" ocean observations program, using the NIKON F-5 digital still camera with 80-200 mm lens and the HDV (high-definition) video camcorder from SM windows 7 & 8 to identify areas with intensive bioproduction confined to the largest upwelling of oceanic floors. *[Uplinked target zones were in the Indian Ocean (Agulhas underwater plateau – water area of the Central Depression) and the South Atlantic (Falklands plateau water area – costal area of Gabon).]*

For Sergey Volkov, the Russian voluntary task list suggested another ECON KPT-3 session, making observations and taking aerial photography of environmental conditions for Russia's Environmental Safety Agency (ECON) using the Nikon D2X digital camera with SIGMA 300-800mm telephoto lens. *[Today's target zone: the contaminated coastal area in the Persian Gulf.]*

More unpacking of US cargo from Progress 29P was on Reisman's "job jar" task list for today.

RS ASU Update: While using the SM toilet facility (ASU) on Wednesday last week, the crew heard a loud noise and later received the separation LED (Light Emitting Diode) indication. They removed & replaced the separator which is a part of the whole pump package, but the system was still exhibiting degraded suction. The decision was made today to have the crew R&R the MNR (Micropump Separator) with the last spare they had onboard. Preliminary indications are that the R&R of the MNR has fixed the problem, although specialists continue to monitor the situation. Preparations are in work to fly a replacement MNR on 1J if requested.

SKV-2 Troubleshooting Update: A small amount of coolant was discharged in the morning of 5/23 while the crew attempted to re-fill the SM SKV-2 air conditioner with Freon-218 (Khladon). The crew reported that a valve did not fit correctly resulting in the discharge. The crew quickly realized this and plugged the fitting. Ground specialists had the crew stand down on this activity for today and were assessing the leaky fitting. The SKV-2 coolant was delivered via 29P, to recharge the unit after it experienced a leak on 4/29.

Weekly Science Update *(Expedition Seventeen -- Week 5)*

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Measurements continue in FGB module.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System):

Harvesting of B3 and B4 was completed on 05/23. “Thank you for your diligent work on CW/RW and also for the last-minute gathering of EMCS hardware for return on 1J. The final activity remaining for CW/RW is the relocation of the KFTs from the +2C dewar to a -95C dewar in MELFI.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed.

EuTEF (European Technology Exposure Facility): The experiment platform continues to operate nominally, although the platform is rather cold due to unfavourable beta angles. A DHPU (Data Handling Processing Unit) software patch is currently developed to fix the link error issues encountered with DEBIE-2 and FIPEX instruments. - DEBIE-2: Link error still under investigation; - DOSTEL: On-going science acquisition; - EuTEMP: Currently inactive as planned; - EVC: Inactive; - EXPOSE: On-going science acquisition; - FIPEX: A new script was uplinked on 05/19, but it stopped too quickly on 05/20. A modified script was then uplinked on 05/21, started on 05/22 and is now scheduled to run up to 05/27; - MEDET: On 05/18, the instrument had to be switched off because it reached the low temperature limit. Awaiting more favourable thermal conditions to restart science acquisition; - PLEGPAY: Instrument is powered on, but not in science acquisition mode; - TRIBOLAB: The Pin On Disk run #3 (POD#3) was restarted nominally on 05/17 and has been running nominally since then.

FSL (Fluid Science Laboratory): FSL MIL Bus cable repair was successfully performed on 5/5. After FSL Rack Activation from ground on 5/8, the ground confirmed that the FSL cables repair activities were successful. Further troubleshooting activities will be required with CEM-U (Upper) Optical Module.

GEOFLOW: Further troubleshooting activities with CEM-U (Upper) Optical Module are required. A new lamp set is manifested on STS-124/1J. GEOFLOW start is pending further FSL troubleshooting, and remaining commissioning activities (check

of FSL optical modes). This will not occur prior to 1J flight.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Complete.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 "Pirs".

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION w/REPOSITORY: "Garrett, thanks for your continued attention to detail in completing your FD60 Nutrition/Repository session. This was your final in-flight sample collection. We appreciate your efforts in keeping to the science/ timeline constraints during blood draw procedures. Thanks for your participation!"

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Inc16 samples have been downloaded with 15S and handed over to science team.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): "Garrett, per the schedule, you have completed your last week of required sleep logging. Next week you will have your last Actiwatch download/initialization session. During your last download session, the PI did not like the way the data was scaling. As of

now you are not at risk of being lost as a subject, but we would like to preserve as much data as we can for later troubleshooting or ground analysis. Therefore, during this session, you will remove the Li battery in your Actiwatch to assist in ground troubleshooting. You will download, initialize, and don Peggy's CDR Actiwatch. We greatly appreciate your participation."

SOLAR (Solar Monitoring Observatory): The last Sun observation period has closed on 05/10. The next observation windows will start on 06/03. - SOVIM: Waiting for the Sun. During last week, the ground teams performed troubleshooting on the SOVIM covers, but with no luck; - SOLSPEC: Waiting for the Sun;
- SOLACES: Waiting for the Sun.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): The 4 EC's of Rotor B are yet to be retrieved by the crew from the blocked Rotor B. The first troubleshooting activity, which consists of inserting back 6 Reference Experiment Containers (ECs) into the Rotor A, has been performed on 05/15. Unfortunately, while activating BIOLAB from ground after this crew activity, a caution signal was encountered with the BIOLAB Smoke Detector. Engineering teams are analyzing the telemetry. The next BIOLAB activity (Rotor B Locking Pin actuator exchange) is currently planned on 05/27.

CEO (Crew Earth Observations): Through 5/20 the ground has received a total of 1,768 of ISS/CEO images for review and cataloging. "We are currently reviewing imagery with camera times corresponding to the following target list requests: Riachao Ring Impact Crater, Brazil (not apparent yet in your views); Serra da Cangalha Impact Crater, Brazil (not apparent yet in your views); High Central Andean Glaciers (many excellent views of a number of rarely-photographed icefields and small glaciers); and Antarctic Ice Pack (poor weather and lighting reveals only a few small icebergs). Very poor lighting conditions for daylight awake passes have persisted in the Southern Hemisphere this week with your orbit tracks staying near the terminator. Hang in there! Viewing conditions and opportunities should improve dramatically next week. Your striking image of the Zion National Park area, acquired late last month, will be posted on NASA/GSFC's Earth Observatory website this weekend. The extent and orientation of the erosion

pattern and linear “joint” fractures are beautifully documented”.

CEO photography can be studied at this “Gateway” website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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- *6/04 -- JPM Vestibule outfitting, Reisman/Chamitoff handovers*
- *6/05 -- EVA-2 (11:30am, 6.5 hrs), JTVE install, JRMS cvr remv, NTA prep, CP 9 ETVCG retrv*
- *6/06 -- JLP relocate to JPM; JLP Vestibule leak check*
- *6/07 -- JLP Vestibule outfitting*
- *6/08 -- EVA-3 (10:30am, 6.3 hrs), S1 NTA install, CP9 ETVCG install, JRMS cover remove*
- *6/09 -- JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R*
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10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/10/08 -- STS-126/Endeavour/ULF2 launch – MPLM Leonardo, LMC
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch

11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 05/24/08
Date:	Saturday, May 24, 2008 2:58:26 PM
Attachments:	

ISS On-Orbit Status 05/24/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – off-duty day for CDR Volkov, FE-1 Kononenko & FE-2 Reisman.*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the Service Module (SM) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

The crew also performed regular maintenance inspection & cleaning on fan grilles in the FGB (FS5 & FS6, TsV2), SM (VPkhO & VPrK), DC1 (V3) and in the COL (Columbus Orbital Laboratory) for ESA.

Additionally, CDR Volkov conducted the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables, the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP and today also the periodic cleaning of the pre-filter of the POTOK air filtration system. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

At ~10:05am EDT, the crewmembers held their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP/Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit

events.

The three crewmembers conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

Afterwards, Garrett transferred the crew's exercise data file to the MEC for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

The Russian crewmembers had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Oleg at ~7:25am, Sergey at ~8:30am.

At ~3:00am, Oleg Kononenko held a telephone conference with Conference with Vladimir Stepanovich Krivtsov, the President of Kharkov Aviation Institute. Oleg is a KhAI alumnus. *[Every year at the end of May KhAI alumni, employees of enterprises and organizations of Russia, Ukraine, and other countries, also KhAI faculty and students, are celebrating a holiday, the Khai Day, which takes place on 5/24.]*

At ~11:30am, the crew downlinked two PAO TV messages of greetings, one for veteran cosmonaut V. I. Tereshkova, the other for the 10th International Festival Childhood without Borders. *[The city of Yaroslavl is getting ready for the 45th anniversary celebration of the first female-cosmonaut flight into space. The Vostok-6 space vehicle with Valentina Vladimirovna Tereshkova on board was launched into near-Earth orbit on June 16, 1963. The flight continued for almost three days. At the same time with Vostok-6, Vostok-5 with Valery Bykovski was on orbit as well. The International festival "Childhood without Borders" is held in Moscow on an annual basis. This festival is an open forum to demonstrate abilities and creativity of children, children's organizations and groups, and adults working with children to support their creative forces and initiative. On the eve of 6/1, the International Children's Day, children and adults from various regions of Russia and abroad get together in Moscow to demonstrate a need for a constructive dialog regarding the present and the future for children and young adults.]*

New items on the discretionary task lists for Garrett, Sergey and Oleg for today were unpacking of 29P US cargo & CHeCS rack audit/survey by Reisman, and another EKON earth observation session for Volkov.

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:02pm EDT nominal)
06/02/08 -- STS-124/Discovery/1J docking (1:49pm)

Tentative STS-124 docked working timeline:

- *6/03 -- EVA-1 (11:30am, 6.5 hrs.), OBSS transfer, JPM prep, S3/S4 SARJ TBA install, JPM install*
- *6/04 -- JPM Vestibule outfitting, Reisman/Chamitoff handovers*
- *6/05 -- EVA-2 (11:30am, 6.5 hrs), JTVE install, JRMS cvr remv, NTA prep, CP 9 ETVCG retrv*
- *6/06 -- JLP relocate to JPM; JLP Vestibule leak check*
- *6/07 -- JLP Vestibule outfitting*
- *6/08 -- EVA-3 (10:30am, 6.3 hrs), S1 NTA install, CP9 ETVCG install, JRMS cover remove*
- *6/09 -- JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R*
- *6/10 -- Sayonara (~4:00pm), hatch close (~4:30pm)*
- *6/11 -- Undocking (~9:04am); OBSS survey/inspection*
- *6/12 -- Mostly off-duty*
- *6/13 -- Stowing; deorbit preps*
- *6/14 -- Deorbit burn (~9:56am);*

06/14/08 -- STS-124/Discovery landing (KSC: ~10:59am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
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12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD

3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 05/23/08
Date:	Friday, May 23, 2008 6:27:12 PM
Attachments:	

ISS On-Orbit Status 05/23/08

All ISS systems continue to function nominally, except those noted previously or below.

Before breakfast, CDR Volkov, FE-1 Kononenko and FE-2 Reisman began their workday with the periodic session of the Russian biomedical routine assessments PZEh-MO-7/Calf Volume Measurement and PZEh-MO-8/Body Mass Measurement (second for CDR & FE-1, third for FE-2), using the IM mass measurement device which Oleg Kononenko afterwards broke down for stowage. *[Calf measurements (left leg only) are taken with the IZOG device, a custom-sewn fabric cuff that fits over the calf, using the knee and lower foot as fixed reference pints, to provide a rough index of deconditioning in zero-G and effectiveness of countermeasures. For determining body mass in zero-G, where things are weightless but not massless, the Russian IM "scales" measure the inertial forces that arise during the oscillatory motion of a mass driven by two helical metering springs with known spring constants. By measuring the time period of each oscillation of the unknown mass (the crewmember) and comparing it to the period of a known mass, the crewmember's mass is calculated by the computer and displayed.]*

The CDR serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out" cycle to vacuum on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~5:15pm EDT. Filter bed #1 was regenerated yesterday. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. Filter bed 1 was regenerated yesterday. In order to assist in atmosphere scrubbing after the Freon-218 spill from the SKV-2 air conditioner on 4/29, the BMP's regeneration cycle was moded to 5 days instead of the regular 20 days.]*

Today was the periodic water sample collection & processing day for the crew (Week 5). *[FE-2 Reisman collected potable water samples for microbial in-flight analysis at the SRV-K Hot port, SRV-K Warm port & SVO-ZV taps, plus two*

chemical/archival post-flight samples from SRV-K Warm & SVO-ZV, using jointly approved Russian sampling procedures with the U.S. WS&A (Water Sampler & Archiver) kit for collection. The samples will be returned on 1J.]

CDR Volkov spent several hours on refueling the Russian SKV-2 air conditioner with fresh Khladon (Freon-218) delivered on Progress 29P, after conducting a detailed procedures review.

FE-1 Kononenko meanwhile worked on the Matryoshka-R radiation measuring suite, transferring and installing new payload components delivered on 29P, taking documentary photography and verifying proper function of the setup with the LULIN-5 electronics box.

The FE-2 retrieved and stowed the four passive FMK (Formaldehyde Monitoring Kit) sampling assemblies deployed by him on 5/21 in the Lab (at P3, below CEVIS) and Service Module (SM, at the most forward handrail, on panel 307), to catch any atmospheric formaldehyde on a collector substrate for subsequent analysis on the ground. *[Two monitors each are usually attached side by side, preferably in an orientation with their faces perpendicular to the direction of air flow.]*

FE-1 Kononenko set up BKS (Onboard Cable Network) connections in the SM for the new *"Vsplesk" experiment. ["Vsplesk", along with the BTN-M1 "NEUTRON" science equipment, will create a physical model of charged and neutral particles generated during solar bursts and of the neutron albedo of the Earth atmosphere considering solar and geophysical aspects.]*

Reisman had another hour for 1J cargo transfer prepacking. Later, Garrett spent a second hour on private preparations and prepacking for his return.

Garrett continued EVA preparations in the Airlock (A/L) for the STS-124/1J spacewalks. *[The FE-2 "de-gassed" PWRs (Payload Water Reservoirs) #1007 & #1023 for STS-124 and returning them to stowage in the EL (Equipment Lock). "De-gassing" = removing air bubbles from the PWR water that will be used to refill the EMU water tanks, by centripetal force, i.e., swinging to produce temporary "artificial gravity".]*

Still in the A/L, Reisman also terminated the recharge of the second batch of EMU batteries in the BSA (Battery Stowage Assembly).

CDR Volkov worked on the Russian SRVK-2M water condensate processor, installing a new BPK transfer pump delivered on 29P.

In the COL (Columbus Orbital Laboratory), Reisman supported ESA ground

controllers in troubleshooting the IRFA (Intermodule Return Fan Assembly). *[The IRFA is located on the COL sidewall opposite to the ISFA (Intermodular Ventilation Supply Fan Assembly), both behind cover panels.]*

Oleg completed the routine maintenance of the SM's SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Sergey performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

Afterwards, Volkov transferred the crew's exercise data file to the MEC (*Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Kononenko completed the periodic (about twice a month) replenishing of the Elektron oxygen generator's water supply for electrolysis, filling the KOV EDV container with water collected in CWC (Contingency Water Container) #1050 from the Lab CCAA (Common Cabin Air Assembly) dehumidifier. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron shutdown.]*

The FE-1 performed the regular bi-weekly reboots of the SSC (Station Support Computer) File Server and OCA Comm Router laptops.

Later, Reisman used the hand-held CDMK (Carbon Dioxide Monitoring Kit, #1002) to collect measurements for the regular atmospheric status check for $ppCO_2$ (Partial Pressure Carbon Dioxide) in the Lab, SM (at panel 449) and COL (Columbus Orbital Laboratory), and recording CO_2 readings and battery "ticks". *[Batteries were to be replaced if necessary. After all readings were taken, the CDM was deactivated and returned to its stowage place at LAB1S2.]*

At ~4:40am EDT, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU; [Glavnaya operativnaya gruppa upravleniya = "Main Operative Control Group"]), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~4:55am, Sergey & Oleg linked up with TsUP-Moscow stowage specialists via S-band to conduct the weekly IMS tagup, discussing stowage issues and equipment locations.

At ~3:20pm, the ISS crew linked up with the Lead Flight Director at JSC/MCC-H via S-band/audio to conduct their first weekly tagup. *[S/G-2 (Space-to-Ground 2) phone patch via SSC (Station Support Computer)]*.

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05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:02pm EDT nominal)
06/02/08 -- STS-124/Discovery/1J docking (1:49pm)

Tentative STS-124 docked working timeline:

- *6/03 -- EVA-1 (11:30am, 6.5 hrs.), OBSS transfer, JPM prep, S3/S4 SARJ TBA install, JPM install*
- *6/04 -- JPM Vestibule outfitting, Reisman/Chamitoff handovers*
- *6/05 -- EVA-2 (11:30am, 6.5 hrs), JTVE install, JRMS cvr remv, NTA prep, CP 9 ETVCG retrv*
- *6/06 -- JLP relocate to JPM; JLP Vestibule leak check*
- *6/07 -- JLP Vestibule outfitting*
- *6/08 -- EVA-3 (10:30am, 6.3 hrs), S1 NTA install, CP9 ETVCG install, JRMS cover remove*
- *6/09 -- JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R*
- *6/10 -- Sayonara (~4:00pm), hatch close (~4:30pm)*
- *6/11 -- Undocking (~9:04am); OBSS survey/inspection*
- *6/12 -- Mostly off-duty*
- *6/13 -- Stowing; deorbit preps*
- *6/14 -- Deorbit burn (~9:56am);*

06/14/08 -- STS-124/Discovery landing (KSC: ~10:59am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)

10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
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11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
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12/06/08 -- STS-119/Discovery/15A docking
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05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 05/22/08
Date:	Thursday, May 22, 2008 7:01:54 PM
Attachments:	

ISS On-Orbit Status 05/22/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Volkov conducted the periodic servicing of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The regen process will be terminated before sleeptime, at ~5:15pm EDT. Regeneration of bed #2 follows tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. In order to assist in atmosphere scrubbing after the Freon-218 (Khladon) spill from the SKV-2 air conditioner on 4/24, the BMP's regeneration cycle was moded to 5 days instead of the regular 20 days.]*

Volkov & Kononenko spent another 2 hrs working jointly on cargo transfers & stowage from Progress 29P, tracking the moves in the IMS (Inventory Management System).

Reisman meanwhile performed the periodic checkup on active U.S. payloads, i.e., cleaning the ANITA (Analyzing Interferometer for Ambient Air) inlet plus inspecting and filter cleaning of the CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) incubator payload. *[The CGBA incubator is controlled from the ground, with automatic video downlinked to Earth. ANITA is now back up again and running in support of the on-going Freon-218 scrubbing from the cabin air, collecting data every six seconds and downlinking the data daily to the ground team. ANITA monitors low levels of potential gaseous contaminants in the ISS cabin atmosphere with a capability of simultaneously monitoring 32 gaseous contaminants. The experiment is testing the accuracy and reliability of this technology as a potential next-generation atmosphere trace-gas monitoring system for ISS and future spacecraft. This is a cooperative investigation with ESA.]*

Afterwards, the FE-2 worked in the Node-2 reconfiguring the food container stowage in “Harmony”.

Volkov upgraded the Russian RSK1 laptop with new software and ran a test on the fresh load.

Afterwards, Sergey performed monthly maintenance on the deactivated Russian IK0501 GA (Gas Analyzer) of the SOGS Pressure Control & Atmospheric Monitoring System by replacing its CO_2 filter assembly (BF) with a new unit from FGB stowage (done last: 4/11), then reactivating the unit.

FE-1 Kononenko completed another routine radiation data monitoring & logging session for flow & dose power data with the MATRYOSHKA-R and AST spectrometer radiation payload. *[Data were downloaded via OCA and the memory storage card was replaced.]*

Continuing the extended leak checking of the spare BZh Liquid Unit (#056) for the Elektron O_2 generator, Kononenko charged the unit once again with pressurized N_2 from the BPA Nitrogen Purge Unit (#23) to 1 atm (1 kg/cm^2). The last test pressurization was on 4/13. *[During Elektron operation, the inert gas locked up in the BZh has the purpose to prevent dangerous O_2/H_2 mixing. A leaking BZh cannot be used.]*

In the Airlock (A/L), the crew connected EMUs (Extravehicular Mobility Units) #3003 & #3004 to their SCUs (Service & Cooling Umbilicals) and initiated the standard 1-hr scrubbing process on the spacesuit’s cooling water loops, filtering ionic and particulate matter (via a 3-micron filter). The cooling loops were afterwards reconfigured and the EMU water processing kit disassembled and stowed.

Volkov serviced the MSG (Microgravity Science Glovebox), conducting the periodic performance test on the 7SD MOK pressure sensor.

The FE-1 set up the pumping equipment and initiated (later closed out) the periodic 3-hr transfer of urine from EDV-U containers in the SM to the Rodnik BV tanks of Progress M-64/29P (emptied of potable water yesterday).

Garrett Reisman conducted the weekly 10-min. CWC audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated “cue cards” based on the crew’s water calldowns are sent up every other week. The current cue card (17-0002E) lists 39 CWCs (~1378.8.1 L total) for the four types of water identified on board: technical water (756.7 L, for Elektron, flushing,*

hygiene, including470.3 L non-usable water because of Wautersia bacteria), potable water (534.8 L, incl. 88.7 L currently on hold), condensate water (81.5 L), waste/ EMU dump and other (5.8 L). Wautersia bacteria are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]

Later, the FE-2 filled out the regular FFQ (Food Frequency Questionnaire), his ninth, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA/ESA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

Sergey and Garrett reviewed the 400mm & 800mm training videos for photographing the Shuttle RPM (R-bar Pitch Maneuver), then, at 11:15am EDT, linked up with ground specialists at MCC-H for a 15-min debrief to discuss the images downlinked from their recent (5/16) Shuttle RPM skill training. [The skill training prepares the crew for the bottom side mapping of the Discovery upon its arrival on 6/2. During the RPM at ~600 ft from the station, the ISS crew will have only ~90 seconds for taking high-resolution digital photographs of all tile areas and door seals on the Orbiter, to be downlinked for launch debris assessment. Thus, time available for the shooting will be very limited, requiring great coordination between the two headset-equipped photographers and the Shuttle.]

Reisman had another hour for his departure preparations and prepacking.

Volkov completed the routine maintenance of the SM's SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Kononenko performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew conducted their regular 2.5-hr. physical workout program (about half of

which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

Afterwards, Oleg transferred the crew's exercise data file to the MEC for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Garrett conducted the periodic atmospheric sampling in the center of the Lab, SM and JLP with the GSC (Grab Sample Container, #1052, #1095, plus one new from 29P). The three GSCs were then prepacked for return on STS-124/1J.

At ~12:50am, Reisman supported a PAO event downlink for the "G Word" program on the Discovery Home Network which focused on the crew's thoughts on the environment and the planet from orbit.

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:02pm EDT nominal)
06/02/08 -- STS-124/Discovery/1J docking (1:49pm)

Tentative STS-124 docked working timeline:

- *6/03 -- EVA-1 (11:30am, 6.5 hrs.), OBSS transfer, JPM prep, S3/S4 SARJ TBA install, JPM install*
- *6/04 -- JPM Vestibule outfitting, Reisman/Chamitoff handovers*
- *6/05 -- EVA-2 (11:30am, 6.5 hrs), JTVE install, JRMS cvr remv, NTA prep, CP 9 ETVCG retrv*
- *6/06 -- JLP relocate to JPM; JLP Vestibule leak check*
- *6/07 -- JLP Vestibule outfitting*
- *6/08 -- EVA-3 (10:30am, 6.3 hrs), S1 NTA install, CP9 ETVCG install, JRMS cover remove*
- *6/09 -- JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R*
- *6/10 -- Sayonara (~4:00pm), hatch close (~4:30pm)*
- *6/11 -- Undocking (~9:04am); OBSS survey/inspection*
- *6/12 -- Mostly off-duty*
- *6/13 -- Stowing; deorbit preps*
- *6/14 -- Deorbit burn (~9:56am);*

06/14/08 -- STS-124/Discovery landing (KSC: ~10:59am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-65/30P launch

09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/08/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/10/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 05/21/08
Date:	Wednesday, May 21, 2008 7:11:55 PM
Attachments:	

ISS On-Orbit Status 05/21/08

All ISS systems continue to function nominally, except those noted previously or below.

Oleg Kononenko initiated the transfer of the potable water supplies brought up by Progress M-64 to the Service Module (SM)'s Rodnik water tanks (BV1, BV2). Later, the pumping equipment was dismantled and the activities were closed out. *[After hooking up the plumbing connecting the 29P water tanks with the SM Rodnik tankage, the water was transferred at first in self-flow (under its own tank pressure), then using a compressor pump via a GZhS gas/liquid separator, to remove air bubbles in the water. The subsequent filling of the empty Progress tanks with urine will be scheduled later.]*

After CDR Volkov prepared the auditory test equipment, he, FE-1 Kononenko & FE-2 Reisman took the periodic O-OHA (on-orbit hearing assessment) test, a 30-min. NASA environmental health systems examination to assess the efficacy of acoustic countermeasures, using a special MEC (Medical Equipment Computer) laptop application. It was the second session for the three crewmembers. *[The O-OHA audiography test involves minimum audibility measurements for each ear over a wide range of frequencies (0.25-10 kHz) and sound pressure levels, with the crewmembers using individual-specific Prophonics earphones, Bose ANC headsets and the SLM (sound level meter). To conduct the testing, the experimenter is supported by special EarQ software on the MEC, featuring an up/down-arrow-operated slider for each test frequency that the crewmember moves to the lowest sound pressure level at which the tone can still be heard. The baseline test is required not later than about Flight Day 14 for each new Expedition and is then generally performed once per month. Note: There have been temporary hearing deficits documented on some U.S. and Russian crewmembers, all of which recovered to pre-mission levels.]*

Reisman performed the periodic offloading of the Lab CCAA (Common Cabin Air

Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container) with the collected water slated for processing. No samples were required. *[Transferred quantity is determined by allowing tank and CWC equalize with each other. Tank quantity stabilizes at a value higher than the neutral point.]*

Kononenko serviced the Matryoshka-R (RBO-3-2) radiation payload, which has taken over the ESA/RSC-Energia experiment ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS) with its AST Spectrometer, which Oleg rotated through 90 deg, and ALC (ALTCRISS laptop) equipment on DC1 panel 429.

The FE-2 conducted the periodic (monthly) CSA-CP (Compound Specific Analyzer-Combustion Products) maintenance/checkout, today on all four units. *[The CSA-CP is a passive cabin atmosphere monitor that provides quick response capability during a combustion event (fire). Its collected data are stored on a logger. Garrett checked batteries, then zero-calibrated all instruments (to eliminate drift in the combustion sensors). Following zero calibration, the backup units were stowed in the Node, along with the sampling pump, while the prime unit was deployed at the SM Central Post.]*

The CDR had an hour reserved for replacing and updating RODF (Russian Operations Data File) procedures pages.

Garrett relocated the IVCPDS/TEPC (Intravehicular Charged Particle Directional Spectrometer/Tissue Equivalent Proportional Counter), the primary radiation measurement tool in the ISS, from the COL (Columbus Orbital Laboratory) to the Lab at position LAB1S4, plugging its power cable in the CHeCS power/data outlet - port J1 on the PS-120 Junction Box at UOP #2. *[TEPC was installed on the COL1A3 panel by Peggy Whitson at 3/3, powered from the J01 outlet on the COL1AD1 panel. Before that, Dan Tani had relocated TEPC to the SM (panel 410) on 1/23/08 after it had been running in Node-2 since 12/24/07.]*

Sergey unpacked the newly arrived Sokol pressure suit from Progress M-64, conducted a leak check on it and then set it up in the Soyuz BO (Orbital Module) for airing out, i.e., drying out any humidity, later repeating the process on the Sokol gloves. Volkov also prepacked the Sokol with torn zipper for return to Earth. Afterwards, the equipment was stowed.

Reisman & Volkov concluded the Robotics ops begun yesterday by releasing the SSRMS LEE (Space Station Remote Manipulator System/Latching End Effector) at the Node-2 PDGF (Power & Data Grapple Fixture) and maneuvering it to the 1J Docking position. *[The base change to the MBS (Mobile Base System) PDGF was completed yesterday by ground commanding.]*

Oleg Kononenko had another 2 hrs for cargo transfers from 29P to the ISS, keeping track of the moves in the IMS (Inventory Management System).

The FE-2 performed the periodic deployment of four passive FMK (formaldehyde monitoring kit) sampling assemblies in the Lab (at P3, below CEVIS) and SM (at the most forward handrail, on panel 307) for two days, to catch any atmospheric formaldehyde on a collector substrate for subsequent analysis on the ground. *[Two monitors each are usually attached side by side, preferably in an orientation with their faces perpendicular to the direction of air flow.]*

In the US Airlock, Reisman continued EVA suit/tool battery maintenance, terminating the discharge process on the first batch of batteries and initiating it on the second group. *[The charged batteries were removed from the BSA (Battery Stowage Assembly) and stowed in a bag.]*

Later, Garrett had an hour set aside for his departure preparations.

As part of their standard fitness evaluation, Kononenko & Volkov undertook the Russian MO-5 MedOps protocol of Cardiovascular Evaluation during Graded Exercises on the VELO cycle ergometer, assisting each other as CMO (Crew Medical Officer). *[The 50-min assessment, supported by ground specialist tagup via VHF and telemetry monitoring, uses the Gamma-1 ECG equipment with biomed harness, skin electrodes and a blood pressure and rheoplethysmograph cuff wired to the cycle ergometer's instrumentation panels. For the graded exercise, the subject works the pedals after a prescribed program at load settings of 125, 150, and 175 watts for three minutes each. Data output involves a kinetocardiogram, rheoplethysmogram, rheoencephalogram and a temporal pulsogram.]*

The CDR completed the routine maintenance of the SM's SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

The FE-1 performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (FE-

2), and VELO bike with bungee cord load trainer (CDR/ MO-5, FE-1/MO-5).

Afterwards, Reisman transferred the crew's exercise data file to the MEC for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Hard-scheduled for Garrett today was the periodic audit/inventory of CDs in the CD Library II kit stowed in the Lab, going by a master list inside the case, to be hard-scheduled tomorrow of not completed today. *[Any discrepancies and required updates were to be reported to MCC-H.]*

Also on Reisman's timeline today was the periodic survey/inspection of the contents of the CHeCS (Crew Health Care Systems) Rack.

A new item on the US "job jar" task list was the reconfiguration of food stowage containers in Node-2.

At ~12:55pm EDT, the FE-2 supported a live PAO TV interview with the Major League Baseball feature "This Week in Baseball" on Fox TV, to be aired before the "Saturday Game of the Week".

Russian ASU Malfunction: While using the ASU toilet system in the SM, the crew heard a loud noise and the fan stopped working. After some troubleshooting the crew reported that the air/water Separator (MNR-RS) was not working. The crew then replaced the separator with a spare unit but reported afterwards that the ASU lacked suction. The crew next replaced the F-V filter insert, which provided good suction for a while but again exhibited weak suction. TsUP/Moscow instructed the crew to deactivate the ASU and use the toilet facility in the Soyuz spacecraft.

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:02pm EDT nominal)
06/02/08 -- STS-124/Discovery/1J docking (1:49pm)

Tentative STS-124 docked working timeline:

- *6/03 -- EVA-1 (11:30am, 6.5 hrs.), OBSS transfer, JPM prep, S3/S4*

SARJ TBA install, JPM install

- *6/04 -- JPM Vestibule outfitting, Reisman/Chamitoff handovers*
- *6/05 -- EVA-2 (11:30am, 6.5 hrs), JTVE install, JRMS cvr remv, NTA prep, CP 9 ETVCG retrv*
- *6/06 -- JLP relocate to JPM; JLP Vestibule leak check*
- *6/07 -- JLP Vestibule outfitting*
- *6/08 -- EVA-3 (10:30am, 6.3 hrs), S1 NTA install, CP9 ETVCG install, JRMS cover remove*
- *6/09 -- JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R*
- *6/10 -- Sayonara (~4:00pm), hatch close (~4:30pm)*
- *6/11 -- Undocking (~9:04am); OBSS survey/inspection*
- *6/12 -- Mostly off-duty*
- *6/13 -- Stowing; deorbit preps*
- *6/14 -- Deorbit burn (~9:56am);*

06/14/08 -- STS-124/Discovery landing (KSC: ~10:59am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
??/??/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
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09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)

2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 05/20/08
Date:	Tuesday, May 20, 2008 12:43:15 PM
Attachments:	

ISS On-Orbit Status 05/20/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Volkov & FE-1 Kononenko had several hours between them for Progress 29P unloading and cargo transfers, while logging movements in the IMS (Inventory Management System).

FE-2 Reisman meanwhile spent 2.5 hrs in the US Airlock (A/L) completing the previously initiated EVA tool configuration in preparation for the STS-124/1J spacewalks.

Later, Reisman used the G1 video camcorder to take documentary footage of the EVA tools in their final configuration and the current state of the A/L, including mini workstations and contents of the ORU bags to be used, for review by EVA specialists on the ground.

With the SSRMS (Space Station Remote Manipulator System) powered up and the VDS (Video Distribution Subsystem) configured by ground commanding, the FE-2 conducted the pre-launch checkout of the RWS (Robotics Workstations).

Afterwards, CDR Volkov & FE-1 Kononenko started up and tested the POC-DOUG (Portable Onboard Computers/Dynamic Onboard Ubiquitous Graphics) application. *[DOUG is a special application running on the MSS (Mobile Service System) RWS laptops that provides a graphical birdseye-view image of the external station configuration and the SSRMS arm, showing its real-time location and configuration on a laptop during its operation.]*

Reisman & Volkov then took the SSRMS on an automated joint maneuver sequence (OCAS mode = Operator Commanded Auto Sequence) to use the LEE

(Latching End Effector)'s video camera to inspect two areas on the ATV (Automated Transfer Vehicle) for possible MLI (Multi-Layered Insulation) damage.

Subsequently, the SSRMS was maneuvered to grapple the MBS PDGF-3 (Mobile Base System/Power & Data Grapple Fixture 3), followed by a ground-commanded base change to prepare for tomorrow's Robotics ops (during which the other end of the arm will be released at the Node-2 PDGF and maneuvered to the 1J Docking position).

In preparation for the upcoming transfer of potable water from Progress M-64/29P to the Service Module (SM), Oleg Kononenko set up pumping equipment and initiated the compression of the SM Rodnik BV1 tank bladder, monitoring air flow to check for leak tightness (hermeticity). *[Each of the spherical Rodnik tanks BV1 & BV2 consists of a hard shell with a soft membrane (bladder) composed of elastic fluoroplastic. The bladder is used to expel water from the tank by compressed air pumped into the tank volume surrounding the membrane and is leak-tested before water transfer.]*

To provide cooling for the ground-commanded activation of the U.S. CDRA (Carbon Dioxide Removal Assembly), FE-2 Reisman connected the regular ITCS LTL (Internal Thermal Control System/Low Temperature Loop) coolant jumper connection to the LAB1D6 rack. *[CDRA was activated today to test a new half cycle time and increasing the Lab CCAA fan speed. These modifications may be used during the 1J mission so the ground tested them to ensure there are no unforeseen issues. Lab1P6 CCAA fan speed was increased from its nominal 5740 rpm to 6000 rpm. Afterwards, Reisman was to determine if the increase in fan speed caused an unacceptable increase in noise. The purpose of this increase is to improve the Lab air mixing, specifically near the Lab1P1 IMV intake that feeds Node 2.]*

CDR Volkov performed the routine task of taking close-up photos of a scuff mark left by the probe of the Progress 29P's active docking mechanism on the internal part of the FGB passive docking cone mechanism. The pictures were then transferred to OCA for subsequent downlinking. These images are used to refine current understanding of docking conditions. *[The passive drogue (docking cone) ring of the SSVP-StM docking mechanism is rotated out of the passageway and thus accessible for inspection. As other crewmembers before him, the CDR used the Nikon D1X digital still camera to take several pictures with the hatch closed down.]*

The FE-2 completed the monthly run with the MedOps experiment WinSCAT

(Windows Spaceflight Cognitive Assessment Tool) by logging in on the MEC (Medical Equipment Computer) and performing the psychological evaluation exercise on the laptop-based WinSCAT experiment. It was Garrett's third onboard session. *[WinSCAT is a time-constrained questionnaire test of cognitive abilities, routinely performed by astronauts aboard the ISS every 30 days before or after the PHS (periodic health status) test or on special CDR's, crewmembers or flight surgeons request.]*

Sergey completed the routine maintenance of the SM's SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Oleg performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), and RED resistive exercise device (CDR, FE-1, FE-2).

Afterwards, the FE-2 transferred the crew's exercise data file to the MEC for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Volkov & Kononenko had their regular periodic PMCs (Private Medical Conferences) via S- & Ku-band audio/video (Reisman had his yesterday).

Working off the voluntary "job jar" task list, Garrett conducted the periodic audit/ inventory of CDs in the CD Library II kit stowed in the Lab, going by a master list inside the case, to be hard-scheduled tomorrow of not completed today. *[Any discrepancies and required updates were to be reported to MCC-H.]*

Also on Garrett's discretionary job list is the periodic survey/inspection of the contents of the CHeCS (Crew Health Care Systems) Rack.

CEO (Crew Earth Observations) photo target uplinked for today was **Antarctic Ice Pack** *(as ISS orbit tracked into the Southern Hemisphere, the crew had*

opportunities to photograph large rafted ice blocks moving northwards from Antarctica. Looking to the right of track as the station approached Antarctica for breaks in cloud cover – ice may have been visible through these "slots").

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:35am EDT [= epoch]):*
Mean altitude -- 340.7 km
Apogee height -- 344.4 km
Perigee height -- 337.0 km
Period -- 91.35 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005568
Solar Beta Angle -- 68.4 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 40 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54415

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:02pm EDT nominal)
06/02/08 -- STS-124/Discovery/1J docking (1:49pm)

Tentative STS-124 docked working timeline:

- *6/03 -- EVA-1 (11:30am, 6.5 hrs.), OBSS transfer, JPM prep, S3/S4 SARJ TBA install, JPM install*
- *6/04 -- JPM Vestibule outfitting, Reisman/Chamitoff handovers*
- *6/05 -- EVA-2 (11:30am, 6.5 hrs), JTVE install, JRMS cvr remv, NTA prep, CP 9 ETVCG retrv*
- *6/06 -- JLP relocate to JPM; JLP Vestibule leak check*
- *6/07 -- JLP Vestibule outfitting*
- *6/08 -- EVA-3 (10:30am, 6.3 hrs), S1 NTA install, CP9 ETVCG install, JRMS cover remove*
- *6/09 -- JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R*
- *6/10 -- Sayonara (~4:00pm), hatch close (~4:30pm)*
- *6/11 -- Undocking (~9:04am); OBSS survey/inspection*
- *6/12 -- Mostly off-duty*
- *6/13 -- Stowing; deorbit preps*
- *6/14 -- Deorbit burn (~9:56am);*

06/14/08 -- STS-124/Discovery landing (KSC: ~10:59am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)

??/??/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
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10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 05/19/08
Date:	Monday, May 19, 2008 4:14:35 PM
Attachments:	

ISS On-Orbit Status 05/19/08

All ISS systems continue to function nominally, except those noted previously or below. *Crew off-duty day. Underway: Week 5 of Increment 17.*

In the JLP (Japanese Experiment Module Experiment Logistics Module Pressurized Section), FE-2 Reisman performed the periodical status and shell temperature check from the MKAM (Minimum Keep-Alive Monitor).

The crew jointly reviewed the Robotics pre-launch checkout activities ahead, including the updated DOUG (Dynamic Onboard Ubiquitous Graphics) software uplinked for tomorrow's scheduled SSRMS (Space Station Remote Manipulator System) operations and the procedures for starting up the DOUG. *[Tomorrow (5/20) Reisman will check out both RWS (Robotics Workstations), as during the 1 JA prelaunch checkouts. Afterwards, the CDR and FE-2 also have some DOUG setup time and then maneuver the SSRMS into an ATV survey position using a Joint OCAS (Operator Commanded Auto Sequence) to look at two areas for possible MLI (Multi-Layered Insulation) damage. After the survey, the SSRMS will be maneuvered to grapple the MBS PDGF-3 (Mobile Base System/ Power & Data Grapple Fixture 3), followed by a base change by ground commanding to prepare for the next day. On 5/21, the crew will release the other end of the arm at the Node-2 PDGF and maneuver to the 1J Docking position. DOUG is a special application running on the MSS (Mobile Service System) RWS laptops that provides a graphical birdseye-view image of the external station configuration and the SSRMS arm, showing its real-time location and configuration on a laptop during its operation.]*

The FE-2 also set up the video configuration for the Robotics ops by putting in place the necessary cable hook-up of the UOP DCP (utility outlet panel/display & control panel) power bypass cable at the CUP RWS (Cupola Robotic Work Station).

In preparation for the STS-124 spacewalks, Garrett initiated recharge procedures on REBA (Rechargeable EVA Battery Assemblies), HL (Helmet Light), PGT (Pistol Grip Tool), and EMU (Extravehicular Mobility Unit) batteries in the US Airlock. *[This is the first of two recharges that will be required to prepare all batteries for flight, including three contingency batteries for return on STS-124.]*

Kononenko completed the routine maintenance of the SM's SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (FE-2), and VELO bike with bungee cord load trainer (CDR, FE-1).

Afterwards, Reisman transferred the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~5:30am EDT, Sergey Volkov & Oleg Kononenko downlinked a PAO TV message of greetings to the participants of the joint conference "Space for Mankind" of the International Astronautics Academy (IAA) and the K. E. Tsiolkovsky Russian Cosmonautics Academy in Korolev near Moscow, to be replayed at the conference opening on 5/21. *["…The ISS is a place where human achievements in space exploration for the past 50 years have special appreciation. Scientific experiments and practical results obtained in this field have already produced significant impact on the development of the world civilization and on life on Earth and will be doing so in the future….We are proud to note that such a representative conference is taking place in Korolev, the birth place of practical cosmonautics, a place where MCC-M is located, which along with Houston and other centers, controls and operates the ISS; Korolev also is the home base of Energia corporation, whose Soyuz vehicles are used for ISS crew rotations…"]*

At ~5:30am EDT, the crew conducted a telephone conference radio exchange with the editor of the Russian COSMOS Magazine, Yekaterina Timofeyevna Beloglazova

At ~4:10pm EDT, Garrett had his weekly PFC (Private Family Conference) via S-

band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

US Condensate Processing Update: Troubleshooting continued on Lane 3 of the SRVK. The failure of the separator unit was confirmed; to be replaced next week. Teams are working on procedure for pumping US condensate into ATV tanks. ISS will have condensate tanks empty prior to 1J if possible without the water dump. ATV to check whether they can support prep tasks for pumping of US condensate into ATV tanks as early as May 22.

No (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:42am EDT [= epoch]):*
Mean altitude -- 340.7 km
Apogee height -- 344.5 km
Perigee height -- 337.0 km
Period -- 91.35 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005648
Solar Beta Angle -- 65.0 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 37m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54400

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:02pm EDT nominal)
06/02/08 -- STS-124/Discovery/1J docking (1:49pm)

Tentative STS-124 docked working timeline:

- *6/03 -- EVA-1 (11:30am, 6.5 hrs.), OBSS transfer, JPM prep, S3/S4 SARJ TBA install, JPM install*
- *6/04 -- JPM Vestibule outfitting, Reisman/Chamitoff handovers*
- *6/05 -- EVA-2 (11:30am, 6.5 hrs), JTVE install, JRMS cvr remv, NTA prep, CP 9 ETVCG retrv*
- *6/06 -- JLP relocate to JPM; JLP Vestibule leak check*
- *6/07 -- JLP Vestibule outfitting*
- *6/08 -- EVA-3 (10:30am, 6.3 hrs), S1 NTA install, CP9 ETVCG install, JRMS cover remove*

- *6/09 -- JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R*
- *6/10 -- Sayonara (~4:00pm), hatch close (~4:30pm)*
- *6/11 -- Undocking (~9:04am); OBSS survey/inspection*
- *6/12 -- Mostly off-duty*
- *6/13 -- Stowing; deorbit preps*
- *6/14 -- Deorbit burn (~9:56am);*

06/14/08 -- STS-124/Discovery landing (KSC: ~10:59am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
??/??/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 05/18/08
Date:	Sunday, May 18, 2008 9:35:44 AM
Attachments:	

ISS On-Orbit Status 05/18/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – crew off duty. Ahead: Week 5 of Increment 17.*

Crew wake/sleep cycle is back on the regular 2:00am – 5:30pm EDT period.

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the Service Module (SM) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

As part of the house cleaning, CDR Volkov conducted the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP and today also the periodic cleaning of the pre-filter of the POTOK air filtration system. The crew also performed regular maintenance inspection & cleaning on fan grilles in the FGB (FS5 & FS6, TsV2), SM (VPkhO & VPrK), DC1 (V3) and in the COL (Columbus Orbital Laboratory).

FE-2 Reisman ended his FD60 session with the NASA/JSC experiment NUTRITION w/Repository, his second, by collecting a final urine sample upon wakeup for storage in the MELFI (Minus-Eighty Laboratory Freezer for ISS). The sampling kit was then stowed away. *[The current NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative*

markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]

FE-1 Kononenko serviced the Russian BMP (Harmful Impurities Removal System), terminating the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system and starting the process on bed #2. The regen process will be terminated tonight at ~4:55pm EDT. *[Regeneration of each of the two cartridges takes about 12 hours. Filter bed #1 was regenerated overnight. In order to assist in atmosphere scrubbing after the Freon-218 spill from the SKV-2 air conditioner on 4/29, the BMP's regeneration cycle was moded to 5 days instead of the regular 20 days.]*

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exerciser (FE-1 FE-2) and VELO bike with bungee cord load trainer (CDR). *[The RED, as an anaerobic muscle exerciser, allows a variety of routines: squat, heel raises, bent-over rowing, abdominal crunches, deadlift, bench presses, upright rowing, etc. For Sergey & Oleg, who are using RED three times a week, each session features four different routines which vary from day to day to target different muscle groups.]*

At ~6:35am EDT, the ISS crew linked up with the Lead Flight Director at JSC/MCC-H via S-band/audio to conduct their first weekly tagup. *[S/G-2 (Space-to-Ground 2) phone patch via SSC-10 (Station Support Computer 10)]*.

At ~9:15am, the crewmembers held their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP/Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

The CDR and FE-1 had their weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop), Sergey at ~7:00am, Oleg at ~8:20am.

No CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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- *6/04 -- JPM Vestibule outfitting, Reisman/Chamitoff handovers*
- *6/05 -- EVA-2 (11:30am, 6.5 hrs), JTVE install, JRMS cvr remv, NTA prep, CP 9 ETVCG retrv*
- *6/06 -- JLP relocate to JPM; JLP Vestibule leak check*
- *6/07 -- JLP Vestibule outfitting*
- *6/08 -- EVA-3 (10:30am, 6.3 hrs), S1 NTA install, CP9 ETVCG install, JRMS cover remove*
- *6/09 -- JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R*
- *6/10 -- Sayonara (~4:00pm), hatch close (~4:30pm)*
- *6/11 -- Undocking (~9:04am); OBSS survey/inspection*
- *6/12 -- Mostly off-duty*
- *6/13 -- Stowing; deorbit preps*
- *6/14 -- Deorbit burn (~9:56am);*

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10/18/08 -- STS-126/Discovery/ULF2 docking
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3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola

1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 05/17/08
Date:	Saturday, May 17, 2008 11:48:00 AM
Attachments:	

ISS On-Orbit Status 05/17/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – light duty day for CDR Volkov, FE-1 Kononenko & FE-2 Reisman.*

Due to last night's extended duty after the Progress 29P arrival (5:39pm EDT), the crew had an additional 3.5 hrs sleep time this morning, i.e., wakeup – 5:30am EDT; sleep time tonight is back at the regular 5:30pm.

For the ongoing US Sleep study, currently on his voluntary "job jar" task list, FE-2 Garrett Reisman downloaded the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data after wakeup and before breakfast from his Actiwatch to the HRF-1 (Human Research Facility 1) laptop. *[To monitor his sleep/ wake patterns and light exposure, the Flight Engineer wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout this week, for the last time. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

After opening the two hatches between FGB and 29P last night (~8:20pm), Volkov & Kononenko first installed the QD (quick disconnect) screw clamps (BZV) of the docking & internal transfer mechanism (SSVP) to rigidize the coupling and assembled the ventilation/heating air duct.

Next, Kononenko performed the standard air sampling inside the Progress with the Russian AK-1M air sampler, then deactivated the cargo ship.

Much of today's work by Oleg and Sergey focused on Progress M-64/29P unloading, starting with the cosmonauts dismantling the docking mechanism (StM, Stykovochnovo mekhanizma) between the cargo ship and the FGB. *[The StM is the "classic" probe-and-cone type, consisting of an active docking assembly (ASA) with a probe (SSh), which fits into the cone (SK) on the passive docking assembly (PSA)*

for initial soft dock and subsequent retraction to hard dock. The ASA is mounted on the Progress' cargo module (GrO), while the PSA sits on the docking ports of the SM, FGB and DC1.]

Working in the TKG cargo ship, Volkov installed the LKT local temperature sensor commutator (TA251MB) of the BITS2-12 onboard telemetry measurement system, along with its ROM unit (read-only memory, TA765B), a 1-hr. job. The LKT was subsequently switched on by the ground to complete the basic configuration. *[At a later time, Sergey will complete the electronic integration of 29P into the ISS by installing the standard US-21 matching unit, another 1-hr. task. The US-21 matching unit connects the SM with the Progress motion control and DPO thrusters systems, so that they can be commanded by the SM computer system (BVS). After bolting the box down, the CDR will hook up its the telemetry (TM) connector to the BITS2-12 onboard TM system on Go from TsUP, after Moscow had inhibited data output to the VD-SU control system mode, powered off the BITS and deactivated the SKV-2 air conditioner. These systems will subsequently be turned back on. Afterwards, the Progress thrusters will be test fired to insure their functionality in providing attitude control for ISS. 29P is then fully incorporated into the steering logic for the ISS.]*

FE-1 Kononenko attended to the periodic servicing of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The regen process will be terminated tomorrow, followed by regeneration of bed #2. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. In order to assist in atmosphere scrubbing after the Freon-218 (Khladon) spill from the SKV-2 air conditioner on 4/24, the BMP's regeneration cycle was moded to 5 days instead of the regular 20 days.]*

Having reached Day 60 of his flight, Garrett Reisman began his second session with the NASA/JSC experiment NUTRITION w/Repository (the FD30 session having been his first), for which he had to forego exercising and food intake for eight hours. Today's protocol consisted of two blood draws (for Serum & Heparin). Later, the FE-2 set up the equipment for the 24-hour urine collections which start with the first void early tomorrow morning and continue through Sunday morning. *[After performing self-phlebotomy, i.e., drawing blood samples (from an arm vein), the samples were first allowed to coagulate in the Repository for 20-30 minutes, then spun in the HRF RC (Human Research Facility/Refrigerated Centrifuge) and finally placed in MELFI (Minus-Eighty Laboratory Freezer for ISS). No thruster activity was allowed during the blood drawing. The RC was later powered off after a temperature reset to limit wear on the compressor, and cleaned. Background: NUTRITION is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight;*

this includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes. The Clinical Nutritional Assessment profile currently required on all U.S. Astronauts collects blood and urine samples preflight and postflight. NUTRITION expands this protocol by also capturing inflight samples and an additional postflight sample. Furthermore, additional measurements are included for samples from all sessions, including additional markers of bone metabolism, vitamin status, and hormone and oxidative stressor tests. The results will be used to better understand the impact of countermeasures (exercise and pharmaceuticals) on nutritional status and nutrient requirements. The Clinical Nutritional Assessment profile (MR016L), first started on two Mir crewmembers and then on all ISS US crews, nominally consists of two pre-flight and one post-flight analysis of nutritional status, as well as an in-flight assessment of dietary intake using the FFQ (Food Frequency Questionnaire). The current NUTRITION project expands MR016L testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]

Volkov & Kononenko had an hour set aside for transfers from the Progress, going by an uplinked Cargo Transfer List of individual items and their intended stowage locations.

Special attention was given by the FE-1 to the transfer, setup & situational photography of the new BIO-12 REGENERATSIYA (regeneration) payload and its ULITKA (snail) container, designed to study how zero gravity impacts structural and functional recovery of damaged organs and tissues in animal tests.

The FE-2 meanwhile started the downloading of IWIS (Internal Wireless Instrumentation System) structural dynamics data recorded during the docking activities. When completed, Garrett dismantled and stowed the IWIS hardware. *[Structural dynamics data of the docking were also captured by the three RSUs of the EWIS (External Wireless Instrumentation System).]*

Reisman performed the periodic offloading of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1062) with the collected water slated for processing. No samples were required. *[Transferred quantity is determined by allowing tank and CWC equalize with each other. Tank quantity stabilizes at a value higher than the neutral point.]*

Sergey completed the routine maintenance of the SM's SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and*

processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), and RED resistive exercise device (FE-2).

Afterwards, Volkov transferred the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Correction: The STS-124/1J EVA preparations in the Airlock (A/L) scheduled yesterday for Reisman, erroneously reported here as completed, were not done but deferred.

Weekly Science Update *(Expedition Seventeen -- Week 4)*

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Measurements continue in FGB module. Inc16 science data returned on 15S have been handed over to Science Team.

ANITA (Analyzing Interferometer for Ambient Air): Continuing.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): B3 & B4 plants are growing. B3 growth is slower than estimated. Some of the B1 plants are still alive.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed. Inc16 science data returned on 15S and have been handed over to Science Team.

EuTEF (European Technology Exposure Facility): The experiment platform continues to operate nominally. A DHPU (Data Handling Processing Unit) software patch is currently developed to fix the link error issues encountered with DEBIE-2 and FIPEX instruments. - DEBIE-2: Link error still under investigation; - DOSTEL: On-going science acquisition; - EuTEMP: Currently inactive as planned; - EVC: Further troubleshooting is on-going; Still problems to get high-rate data downlink; - EXPOSE: On-going science acquisition; - FIPEX: A new script was uplinked on 5/7 and terminated nominally on 5/11; a new script has been uplinked on 5/14 but not started yet; - MEDET: On-going science acquisition, running nominal; some commanding activities to adjust parameters took place on 5/15; - PLEGPAY: Instrument is powered on, but not in science acquisition mode. New Langmuir probe runs will be started in conjunction with Progress 29P docking on 5/16; - TRIBOLAB: TRIBOLAB Pin On Disk#2 (POD#2) ran nominally until 5/9. The instrument has been put in Thermal Stabilization Mode (TSM) to prepare for an attempt to restart the Pin On Disk#1 (POD#1) run that took place on 5/9. Unfortunately, the POD#1 run went immediately to Non-Nominal Mode (NNM), for the same reason as before (friction coefficient too high); Science team is now planning to start the next POD#3 run on 5/17.

FSL (Fluid Science Laboratory): FSL MIL Bus cable repair was successfully performed on 5/5. After FSL Rack Activation from ground on 5/8, the ground confirmed that the FSL cables repair activities were successful. Further troubleshooting activities will be required with CEM-U (Upper) Optical Module.

GEOFLOW: Further troubleshooting activities with CEM-U (Upper) Optical Module are required. A new lamp set is manifested on STS-124/1J. GEOFLOW start is pending further FSL troubleshooting, and remaining commissioning activities (check of FSL optical modes). This will not occur prior to 1J flight.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal

Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Complete.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION w/REPOSITORY: In progress.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Inc16 samples have been downloaded with 15S and handed over to science team.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): “Garrett, thanks for completing your Actiwatch download/initialization activity. You are also task listed to complete your third week of required Sleep logging this week. Any additional Sleep logging is above and beyond and greatly appreciated by the PI. After completing the Sleep log, you will have one more Actiwatch download session, and then the Actiwatch doff on the Shuttle.”

SOLAR (Solar Monitoring Observatory): During the last Sun observation period, the SOLAR platform, SOVIM and SOLSPEC Sun sensors’ positions have been correlated during a so-called “criss-cross” procedure manoeuvre on 5/5 and 5/8. The last Sun observation period has closed on 5/10. - SOVIM: Waiting for the Sun – some glitches observed in the instrument telemetry during last week; - SOLSPEC: Waiting for the Sun; - SOLACES: Waiting for the Sun, some recurrent

synchronization problems between its microcontrollers during last week.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): The 4 ECs (Experiment Containers) of Rotor B are yet to be retrieved by the crew from the blocked Rotor B. The first troubleshooting activity, which reinserts 6 RECs (Reference ECs) into Rotor A, has been performed on 5/15. Unfortunately, while activating BIOLAB from ground after this crew activity, a caution signal was encountered. Engineering teams are analyzing the telemetry.

CEO (Crew Earth Observations): Through 5/14 the ground has received a total of 1,383 of ISS/CEO images for review and cataloging. "We are currently reviewing imagery with camera times corresponding to the following target list requests: Galeras Volcano, Colombia (preliminarily not acquired); Lake Nasser, Egypt (excellent coverage, this target can be pulled as completed); and Vredefort Impact Crater, South Africa (preliminarily acquired with great coverage). Nice work! Your efforts to acquire imagery of Cologne, Germany have netted partly cloudy views of several cities along the Rhine: Karlsruhe, Mainz, and Koblenz, all too far south. One of your Cologne attempts captured some striking views of the world-famous vineyards along the Moselle River about 50 miles southwest of Koblenz, Germany. One of these frames will be published on NASA/GSFC's Earth Observatory website this weekend. Good eye! Clearly you are making a most diligent effort to respond to our target requests (nearly 400 frames so far). Thank you!"

CEO (Crew Earth Observations) photo target uplinked for today were **High Central Andean Glaciers, S. America** *(weather was favorable for photography of the summit glaciers of the Peruvian Andes. Looking to the left of track as ISS orbit paralleled the South American coastline. Imagery of the upper flanks and summits of the mountains was requested in order to track changes in ice extent and snow cover.*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 4:46am EDT [= epoch]):*
Mean altitude -- 340.8 km
Apogee height -- 344.6 km
Perigee height -- 337.0 km
Period -- 91.35 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005697
Solar Beta Angle -- 56.6 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 50 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54366

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:02pm EDT nominal)
06/02/08 -- STS-124/Discovery/1J docking (1:49pm)

Tentative STS-124 docked working timeline:

- *6/03 -- EVA-1 (11:30am, 6.5 hrs.), OBSS transfer, JPM prep, S3/S4 SARJ TBA install, JPM install*
- *6/04 -- JPM Vestibule outfitting, Reisman/Chamitoff handovers*
- *6/05 -- EVA-2 (11:30am, 6.5 hrs), JTVE install, JRMS cvr remv, NTA prep, CP 9 ETVCG retrv*
- *6/06 -- JLP relocate to JPM; JLP Vestibule leak check*
- *6/07 -- JLP Vestibule outfitting*
- *6/08 -- EVA-3 (10:30am, 6.3 hrs), S1 NTA install, CP9 ETVCG install, JRMS cover remove*
- *6/09 -- JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R*
- *6/10 -- Sayonara (~4:00pm), hatch close (~4:30pm)*
- *6/11 -- Undocking (~9:04am); OBSS survey/inspection*
- *6/12 -- Mostly off-duty*
- *6/13 -- Stowing; deorbit preps*
- *6/14 -- Deorbit burn (~9:56am);*

06/14/08 -- STS-124/Discovery landing (KSC: ~10:59am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
??/??/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)

10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 05/16/08
Date:	Friday, May 16, 2008 6:12:25 PM
Attachments:	

ISS On-Orbit Status 05/16/08

All ISS systems continue to function nominally, except those noted previously or below.

Yest kasaniye! Progress M-64 (29P), approaching from below the station, docked smoothly at the FGB nadir port at 5:39pm EDT, followed by docking probe retraction and hook closure ("sborka") after motion damp-out, while the ISS was in LVLH (local vertical/local horizontal) attitude. All Progress systems operated nominally from Automated Rendezvous start. *[Launched on 5/14 (4:22:56pm EDT), the 29P resupply drone delivered about 2.5 tons (4657 lbs) of cargo for the ISS crews, including propellants (~770 lbs) for the Russian thrusters, fresh water (~925 lbs), oxygen and air (~100 lbs), food, and dry cargo (~2850 lbs), i.e., spare parts, repair gear, life support and science experiment hardware.]*

Since the time of docking was the crew's regular bedtime, their work/sleep cycle was shifted this morning by 3.5 hrs, i.e., wakeup – 5:30am EDT, sleep – 9:00pm. *[Tomorrow: Wakeup – 5:30am; sleep back at 5:30pm]*

For the ongoing US Sleep study, currently on his voluntary "job jar" task list, FE-2 Garrett Reisman downloaded the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data after wakeup and before breakfast from his Actiwatch to the HRF-1 (Human Research Facility 1) laptop. *[To monitor his sleep/ wake patterns and light exposure, the Flight Engineer wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout this week, for the last time. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

Reisman continued EVA preparations in the Airlock (A/L) for the STS-124/1J spacewalks. *[The FE-2 first consolidated PWRs (Payload Water Reservoirs) by transferring the contents of PWR #1025 to #1005 (leaving #1025 empty) and restowing the containers in their E/L (Equipment Lock) location, then "de-gassing"*

PWRs #1007 & #1023 for STS-124 and returning them to stowage. "De-gassing" = removing air bubbles from the PWR water that will be used to refill the EMU water tanks, by centripetal force, i.e., swinging to produce temporary "artificial gravity".]

FE-1 Kononenko meanwhile continued troubleshooting activities on the Russian SRVK-2M(Multifiltration Unit) of the BRPK (Condensate Separation & Pumping Unit), offnominal since 5/6. After tagging up with ground specialists via S-band, Oleg checked out condensate lines to/from the SRVK, purged the lines of the connected filters, turned the NOK-2 condensate pump on/off and finally restored SRVK configuration for running on the second string (Kl3). *[Russian specialists are confident that SRVK functionality can be restored by next week. As of now, one of two SRVK strings is operational (Kl3). Today's troubleshooting focused string 1, followed by refilling of the SKV-2 air conditioner with coolant (Freon-218) next week upon delivery by 29P. Until restoration of SRVK condensate processing, European and Russian specialists are in agreement that transferring about 2 EDVs of US condensate to ATV tanks is a viable option. A water dump into space will thus be avoided.]*

CDR Volkov had again several hours for conducting the periodic inspection & audit of lighting fixtures in the RS (Russian Segment), testing each light by turning it on and checking fixtures that show one or both light bulbs inoperative with a working light unit from spares. *[There are close to two dozen lighting fixtures in the SM (Service Module), about a dozen lights in the FGB and 3 in the DC1 (plus two portable units). An audit of the available light spares will be conducted at a later date.]*

The CDR also continued the periodic inventory of SUBA Onboard Equipment Control System plug-in locations in the RS, supported by an uplinked 4-page checklist, started on 4/29. *[The standard audit establishes what hardware is plugged in at which electrical RS outlets. SUBA controls, monitors, and diagnoses RS systems status. It operates using sensor output signals and command radio link SM functional outputs, onboard computer system (BVS) units, SM control panels, and system relay outputs. Its software resides in the SM central computer (TsVM) and terminal computer (TVM). The BSKs are used to switch electrical power and protect electrical circuits with fuses against overloads.]*

In preparation for the Progress docking and the measurement of structural vibrations caused by it, Reisman earlier installed and programmed IWIS (Internal Wireless Instrumentation System) accelerometer RSUs (Remote Sensing Units) in the Lab, Node-1, Node-2, FGB and SM.

The FE-2 also activated the SSC6 (Station Support Computer 6) A31p laptop in the FGB for handling the video transmission from the RS via the Ku-band assets in the

USOS. *[The A31p used for the routing from the SM is located in the FGB since available cables are not long enough to extend to the Node. The video signal is fed from there via coaxial cable to the SSC Operations LAN (local area network) and from there into the Ku-band system for subsequent conversion from the Russian SECAM format to the American NTSC format on the ground. The video stream, a digital MPEG (Moving Pictures Expert Group 2) transmission originating in the RS by the Russian/ESA encoder, passes via the ISS JSL (Joint Station LAN) through Ku-band to both MCCs.]*

With the U.S. CDRA (Carbon Dioxide Removal Assembly) deactivated by the ground early this morning (~2:00am-7:00am) and its cooling no longer required, Reisman demated and took down the ITCS LTL (Internal Thermal Control System/ Low Temperature Loop) jumper at the CDRA-supporting LAB1D6 rack.

Volkov & Kononenko reviewed ground recommendations and rendezvous/approach data in preparation for the 29P docking, which required their visual confirmation (plus telemetry signal) of KURS-A antenna retraction before the docking at the FGB nadir port. Latest flight info was also required for updating the TORU teleoperated control system, which was on “hot standby” during the linkup, with Sergey & Oleg monitoring the process.

After the cargo ship’s successful docking, activities by the two cosmonauts included –

- shutting off TORU and reconfiguring the STTS telephone/telegraph subsystem to normal ops *[the "Voskhod-M" STTS enables telephone communications between the SM, FGB, DC1 and U.S. segment (USOS), and also with users on the ground over VHF channels selected by an operator at an SM comm panel, via STTS antennas on the SM’s outside. There are six comm panels in the SM with pushbuttons for accessing any of three audio channels, plus an intercom channel. Other modes of the STTS include telegraphy (teletype), EVA voice, emergency alarms, Packet/Email, and TORU docking support];*
- conducting the standard one-hour leak checking of the docking vestibule and fuel/oxidizer transfer line interface between Progress and FGB *[during leak checking and initial clamp installation, Russian thrusters were inhibited (as was the case during docking)]*;
- opening the hatches (~7:35pm) and installing the QD (quick disconnect) screw clamps (BZV) of the docking & internal transfer mechanism (SSVP) to rigidize the coupling;
- deactivating Progress and assembling the ventilation/heating air duct (~8:00pm);
- performing the standard air sampling inside the Progress with the Russian

AK-1M air sampler; and

- deactivating and removing the video equipment for the TV Ku-band downlink of the docking.

Later, before sleep time and on TsUP Go, Volkov will also switch hatch KVDs (Pressure Equalization Valves) between FGB and Progress to electric control mode.

In the US Lab, Garrett Reisman set up the hardware associated with urine and blood collections for his first session of NASA's NUTRITION/Repository experiment, scheduled on his timeline tomorrow. For the blood draw, Garrett has to start fasting 8 hrs before, with only water consumption allowed. *[The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R +30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

Garrett worked in the COL (Columbus Orbital Laboratory), removing & replacing failed MLU LHAs (Module Lighting Unit/Lamp Housing Assemblies).

Reisman also used the hand-held CDMK (Carbon Dioxide Monitoring Kit, #1002) to collect measurements for the regular atmospheric status check for $ppCO_2$ (Partial Pressure Carbon Dioxide) in the Lab, SM (at panel 449) and COL, and recording CO_2 readings and battery "ticks". *[Batteries were to be replaced if necessary. After all readings were taken, the CDM was deactivated and returned to its stowage place at LAB1S2.]*

Later, the FE-2 filled out the regular FFQ (Food Frequency Questionnaire), his eighth, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA/ESA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

Volkov & Reisman performed their second standard 30-min Shuttle RPM (R-bar

Pitch Maneuver) skill training, using the DCS-760 digital still camera with 400 & 800mm lenses at SM windows 6 & 8 (facing in flight direction) to take CEO (Crew Earth Observations) target imagery using auto focus only, with images having 40-50% overlap and about 20 images in each sequence. Afterwards, the obtained OBT (onboard training) images were downlinked to the ground for analysis (~9:30am). *[The RPM drill prepares crewmembers for the bottom-side mapping of the Orbiter at the arrival of the Shuttle (STS-124/1J) on 6/2 . During the RPM at ~600 ft from the station, the "shooters" have only ~90 seconds for taking high-resolution digital photographs of all tile areas and door seals on Discovery, to be downlinked for launch debris assessment. Thus, time available for the shooting will be very limited, requiring great coordination between the two headset-equipped photographers and the Shuttle pilot.]*

Reisman completed the routine maintenance of the SM's SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Kononenko performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (FE-2), and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Garrett transferred the crew's exercise data file to the MEC for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~7:25am EDT, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU [Glavnaya operativnaya gruppa upravleniya = "Main Operative Control Group"]), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

CEO (Crew Earth Observations) photo targets uplinked for today were **Riachao Ring Impact Crater, Brazil** *(weather was predicted to be clear over the Brazilian Highlands, and ISS had a near-nadir pass over this 4.5 km diameter crater. The*

expression of the crater on the landscape is subtle - it is defined mainly by a semicircular hill mostly covered in vegetation. Overlapping nadir-viewing frames, taken along track, were recommended in order to capture the crater), and **Serra da Cangalha Impact Crater, Brazil** *(this 12 km diameter crater is located to the SW of the preceding Riachao Ring target, and likewise is a subtle feature on the landscape. It is mainly defined by a circular drainage pattern surrounding the remnants of a central peak. Overlapping nadir frames, taken along track, were recommended in order to capture the crater)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:41am EDT [= epoch]):*
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Eccentricity -- 0.0005787
Solar Beta Angle -- 53.0 deg (magnitude decreasing)
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Mean altitude loss in the last 24 hours -- 50 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54352

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:02pm EDT nominal)
06/02/08 -- STS-124/Discovery/1J docking (1:49pm)

Tentative STS-124 docked working timeline:

- *6/03 -- EVA-1 (11:30am, 6.5 hrs.), OBSS transfer, JPM prep, S3/S4 SARJ TBA install, JPM install*
- *6/04 -- JPM Vestibule outfitting, Reisman/Chamitoff handovers*
- *6/05 -- EVA-2 (11:30am, 6.5 hrs), JTVE install, JRMS cvr remv, NTA prep, CP 9 ETVCG retrv*
- *6/06 -- JLP relocate to JPM; JLP Vestibule leak check*
- *6/07 -- JLP Vestibule outfitting*
- *6/08 -- EVA-3 (10:30am, 6.3 hrs), S1 NTA install, CP9 ETVCG install, JRMS cover remove*
- *6/09 -- JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R*
- *6/10 -- Sayonara (~4:00pm), hatch close (~4:30pm)*
- *6/11 -- Undocking (~9:04am); OBSS survey/inspection*

- *6/12 -- Mostly off-duty*
- *6/13 -- Stowing; deorbit preps*
- *6/14 -- Deorbit burn (~9:56am);*

06/14/08 -- STS-124/Discovery landing (KSC: ~10:59am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
??/??/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
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10/01/08 -- **NASA 50 Years**
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11/20/08 -- **ISS 10 Years**
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11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 05/15/08
Date:	Thursday, May 15, 2008 1:52:28 PM
Attachments:	image002.gif

ISS On-Orbit Status 05/15/08

All ISS systems continue to function nominally, except those noted previously or below.

Progress M-64/29P launched nominally yesterday at Baikonur at 4:22:56pm EDT, when ISS was leading with 152 deg phase angle ***(see photo below)***. Ascent was nominal, all appendages (antennae & solar arrays) deployed nominally, and the vehicle reached orbital insertion at 4:31:41pm. Corrective maneuvers DV1 & DV2 were conducted as per plan at 8:12:27pm (delta-V 22.62 m/s) and 8:50:36pm (23.71 m/s). 29P is scheduled to dock to the ISS FGB nadir port tomorrow evening (5/16) at 5:37pm. *Congratulations, Baikonur! [The cargo ship will deliver more than 2.3 tons of various supplies to the ISS, including oxygen, water and food supplies, propellant, a new Sokol KV-2 spacesuit, consumables, scientific hardware and equipment. The spacecraft was injected into a reference near-earth elliptical orbit with 51.65° inclination, min/max altitudes of 193.9/245.9 km and 88.57 min revolution. Onboard systems are operating as designed as the "chase" is on.]*

For the US Sleep study, currently on his voluntary "job jar" task list, FE-2 Garrett Reisman downloaded the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data after wakeup and before breakfast from his Actiwatch to the HRF-1 (Human Research Facility 1) laptop. *[To monitor his sleep/wake patterns and light exposure, the Flight Engineer wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout this week, for the last time. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

For the Russian Sleep study, CDR Volkov terminated his second MBI-12 SONOKARD experiment session upon wake-up by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through*

computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]

After their 3-hr training course on 5/13 with the TORU teleoperator control system, Volkov & Kononenko today conducted a joint teleconference with ground specialists, discussing the results of the drill, in preparation for tomorrow's 29P docking. *[The TORU provides a manual backup mode to the Progress' KURS automated rendezvous radar system in case of KURS failure. Receiving a video image of the approaching ISS, as seen from a Progress-mounted docking television camera ("Klest"), on a color monitor ("Simvol-Ts", i.e. "symbol center") in the Service Module (SM), which also displays an overlay of rendezvous data from the onboard digital computer, the CDR would steer the Progress to mechanical contact by means of two hand controllers, one for rotation (RUO), the other for translation (RUD), on adjustable armrests. The controller-generated commands are transmitted from the SM's TORU control panel to the Progress via VHF radio. In addition to the Simvol-Ts color monitor, range, range rate (approach velocity) and relative angular position data are displayed on the "Klest-M" video monitor (VKU) which starts picking up signals from Progress when it is still approximately 8 km away. TORU is monitored in real time from TsUP over Russian ground sites (RGS) and via Ku-band from Houston, but its control cannot be taken over from the ground. Tomorrow, Progress KURS-A (active) will be activated at 4:04pm EDT on Daily Orbit 16 (DO16), SM KURS-P (passive) two minutes later. Progress' headlight will be switched on at a range of ~8 km. Flyaround to the FGB nadir docking port (~400 m range, in sunlight) starts at 5:14pm. Start of final approach: 5:27:30pm (DO1). Local sunset: ~5:34pm. Estimated time of contact: 5:36:30pm.]*

FE-2 Reisman had 2 hrs set aside for the periodic updating of the onboard "Red Book" emergency procedures documents. *[Garrett collected the five copies of the 1J/A EMER-1 book (from Soyuz, SM, Airlock, Lab,and Node-2), removed outdated pages, replaced them with new pages and restowed the books at their designated locations.]*

In preparation for the cargo loading/unloading activities ahead during the STS-124/1J docked period (6/2-6/11), the crew conducted a joint review of uplinked material comprising the 1J Transfer List and a summary of the intricate "choreography" of the transfer activities.

FE-2 Reisman afterwards had 1.3 hrs for marshalling and prepacking 1J transfer cargo.

Later (~12:05pm), the FE-2 and his crewmates tagged up with ground specialists to discuss transfer implementation details.

FE-1 Kononenko continued troubleshooting activities on the Russian SRVK (Multifiltration Unit) of the BRPK (Condensate Separation & Pumping Unit), off since 5/6. *[Russian specialists are confident that SRVK functionality can be restored by next week. As of now, one of two SRVK strings is operational. Troubleshooting will continue tomorrow on string 1, followed by refilling of the SKV-2 air conditioner with coolant (Freon-218) next week upon delivery by 29P. Until restoration of SRVK condensate processing, European and Russian specialists are in agreement that transferring about 2 EDVs of US condensate to ATV tanks is a viable option. A water dump into space will thus be avoided.]*

In the COL (Columbus Orbital Laboratory), Reisman supported ground activities on the BLB (Biolab) incubator by installing RECs (Reference Experiment Containers) on Rotor A, then activating COL1A2 rack software. *[Further BLB troubleshooting will require replacement of the locking pin with a new pin manifested on Flight 1J.]*

The CDR had an additional 2.5 hrs reserved to continue the periodic Russian SPOPT (Fire Detection & Suppression System) maintenance in the FGB, started yesterday, by dismantling IDZ-2 smoke detectors, cleaning their ionizing needles and then reinstalling the sensors. *[Part of the job is inspection and cleaning of surrounding areas behind panels. More SPOPT SD maintenance is scheduled tomorrow.]*

Kononenko completed the periodic (about twice a month) replenishing of the Elektron oxygen generator's water supply for electrolysis, filling the KOV EDV container with water collected in CWC (Contingency Water Container) #1050 from the Lab CCAA (Common Cabin Air Assembly) dehumidifier. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron shutdown.]*

Meanwhile, Garrett conducted the weekly 10-min. CWC audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week. The current cue card (17-0002D) lists 38 CWCs (~1480.1 L total) for the four types of water identified on board: technical water (772.7 L, for Elektron, flushing, hygiene), potable water (625.2 L), condensate water (76.4 L), waste/EMU dump and other (5.8 L). Of the 38 containers, 15 CWCs with technical water (620.5 L) and 4 CWCs with potable water (176.3 L) must be cleared for Wautersia bacteria by MCC-H before they can be used. Follow-up: As of 5/13, partial results of the sample analysis are now available for the five CWCs transferred from STS-123/1J/*

A. Two potable water CWCs (#1094, #1095) and three technical water CWCs (#1043, #1071, #1070) have exhibited no bacterial, coliform or fungi growth after standard incubation periods. One of the three technical water CWC samples indicated some bacterial growth but at a level within the potable water acceptability limit. The Wautersia bacteria of this sample are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.]

Sergey & Oleg underwent their first periodic (generally monthly) health test with the cardiological experiment PZEh MO-1 ("Study of the Bioelectric Activity of the Heart at Rest") on the TVIS (Treadmill with Vibration Isolation System). *[During the 45-min. test, the crewmembers tagged up with ground specialists on an RGS (Russian ground site) pass on DO14 via VHF and downlinked data from the Gamma-1M ECG (electrocardiograph) for about 5-6 minutes.]*

The FE-1 completed the routine maintenance of the SM's SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Later, Kononenko performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Oleg also had his third run with the Russian DZZ-2 "Diatomeya" ocean observations program, using the NIKON F-5 digital still camera with 80-200 mm lens and the HDV (high-definition) video camcorder from SM windows 7 & 8 to obtain color blooms in water area and large irregularities in cloud cover above the ocean and in surface wave fields.

In the SM, Reisman deactivated the onboard amateur radio equipment (a Kenwood VHF transceiver with manual frequency selection, headset, and power supply) to prevent radio interference during the prox ops with the arriving Progress spacecraft.

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR/ MO-1, FE-1/ MO-1, FE-2), and RED resistive exercise device (FE-1, FE-2). *[The RED, as an anaerobic muscle exerciser, allows a variety of routines: squat, heel raises, bent-over rowing, abdominal crunches, deadlift, bench presses, upright rowing, etc. For Sergey & Oleg, who are using RED three times a week, each*

session features four different routines which vary from day to day to target different muscle groups.]

Later tonight, Reisman will transfer the crew's exercise data file to the MEC for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~3:45am EDT, Sergey & Oleg linked up with TsUP-Moscow stowage specialists via S-band to conduct the weekly IMS tagup, discussing stowage issues and equipment locations. *[Topics of discussion today included photo equipment listed as stowed in the Soyuz BO "divan", ID number of a battery slated for disposal, location of the kits for two NIKON F5 cameras, etc.]*

At ~4:15pm EDT, Garrett is scheduled for his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

ANITA Update: After some helpful troubleshooting by Reisman yesterday, the ANITA (Analyzing Interferometer for Ambient Air) instrument is again downlinking health and status data nominally.

A/L F1 Rack Update: Additional work by Garrett on the Airlock Avionics Rack yesterday completed rotating the rack back into place. *[The lower pivot fittings were removed allowing the top attachment points (knee braces) to be secured. One lower launch restraint was re-installed. The two lower pivot fittings were not re-installed, but were stowed behind the rack. This configuration is acceptable for on-orbit loads. Reisman also returned the stowage into the airlock. Background: The F1 rack had to be rotated away from the A/L wall to allow the (successful) replacement of the failed ATU-6 (Audio Terminal Unit #6) with a spare unit. Afterwards, Garrett was unable to rotate the structure completely back into place.]*

MFCV Adjustment Update: Yesterday's scheduled ITCS MTL (Internal Thermal Control Systems/Moderate Temperature Loop) flow adjustment of four MFCVs (Manual Flow Control Valves) in the Lab could not be completed when it turned out that the non-intrusive Flow Meter, required for the adjustment, would not remain powered. Several attempts to power it were unsuccessful. Ground teams are assessing next troubleshooting steps. The adjustment is required for the Regen ECLSS rack that arrives later this year on ULF2.

CEO (Crew Earth Observations) photo targets uplinked for today were **Vredefort Impact Crater, S. Africa** *(shooting slightly to the left of track for this 300-km diameter impact structure, which is over 2 billion years old. Despite the operation of*

tectonic and weathering processes over that time, the impact structure is still recognizable. Overlapping frames of the crater and surrounding area were requested to provide context for higher resolution imagery), **Madrean Sky Islands, Mexico** *(ISS orbit track paralleled the eastern shoreline of the Gulf of California. As ISS moved SE-ward along the coast, the crew was to aim the camera to the left of track for the prominent mountains of the Sierra Madre [oriented roughly north-south in Mexico]. General context imagery of the mountains is desired as a baseline for assisting in locating of the "sky islands" near the peaks),* **Kingman Reef, Hawaiian Island chain** *(weather was predicted to be mostly clear over this long narrow reef at the time of this near-nadir pass. High resolution imagery of reefs was requested to track changes in morphology over time),* and **Palmyra Atoll, Central Pacific** *(located directly to the SE of the previous Kingman Reef target, Palmyra Atoll consists of small islands and submerged reefs. ISS had a near-nadir pass over the atoll. High resolution imagery of the islands and adjacent reefs was requested)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:52am EDT [= epoch]):*
Mean altitude -- 340.9 km
Apogee height -- 345.0 km
Perigee height -- 336.8 km
Period -- 91.35 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006031
Solar Beta Angle -- 47.3 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 44 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54337

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/16/08 -- Progress M-64/29P docking/FGB nadir (5:37pm)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:02pm EDT nominal)
06/02/08 -- STS-124/Discovery/1J docking (1:49pm)

Tentative STS-124 docked working timeline:

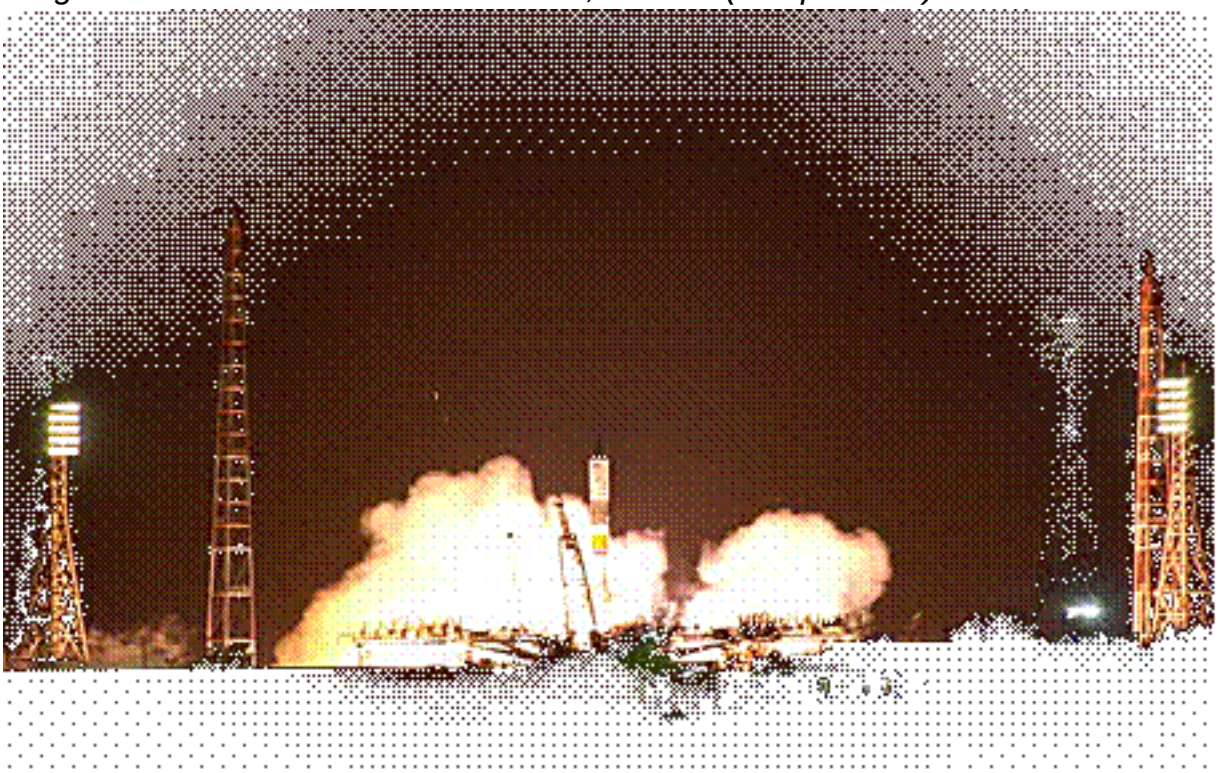
- *6/03 -- EVA-1 (11:30am, 6.5 hrs.), OBSS transfer, JPM prep, S3/S4 SARJ TBA install, JPM install*
- *6/04 -- JPM Vestibule outfitting, Reisman/Chamitoff handovers*
- *6/05 -- EVA-2 (11:30am, 6.5 hrs), JTVE install, JRMS cvr remv, NTA prep, CP 9 ETVCG retrv*

- *6/06 -- JLP relocate to JPM; JLP Vestibule leak check*
- *6/07 -- JLP Vestibule outfitting*
- *6/08 -- EVA-3 (10:30am, 6.3 hrs), S1 NTA install, CP9 ETVCG install, JRMS cover remove*
- *6/09 -- JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R*
- *6/10 -- Sayonara (~4:00pm), hatch close (~4:30pm)*
- *6/11 -- Undocking (~9:04am); OBSS survey/inspection*
- *6/12 -- Mostly off-duty*
- *6/13 -- Stowing; deorbit preps*
- *6/14 -- Deorbit burn (~9:56am);*

06/14/08 -- STS-124/Discovery landing (KSC: ~10:59am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
??/??/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

Progress M-64/29P Launch at Baikonur, 5/14/08 (4:23pm EDT)



From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 05/14/08
Date:	Wednesday, May 14, 2008 1:30:05 PM
Attachments:	

ISS On-Orbit Status 05/14/08

All ISS systems continue to function nominally, except those noted previously or below.

For the US Sleep study, currently on his voluntary "job jar" task list, FE-2 Garrett Reisman downloaded the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data after wakeup and before breakfast from his Actiwatch to the HRF-1 (Human Research Facility 1) laptop. *[To monitor his sleep/wake patterns and light exposure, the Flight Engineer wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout this week, for the last time. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

For the Russian Sleep study, FE-1 Oleg Kononenko terminated his second MBI-12 SONOKARD experiment session upon wake-up by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. CDR Sergey Volkov in turn will start his second overnight MBI-12 session tonight. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

Also before breakfast and first exercise, the three crewmembers completed a brief (15 min.) session each with the Russian MO-9/Biochemical Urinalysis assessment of the crew health monitoring program. *[MO-9 is conducted every 30 days (and also before and after EVAs) and is one of five nominal Russian medical tests adopted by NASA for U.S. crewmembers for IMG PHS (Integrated Medical Group/*

Periodic Health Status) evaluation as part of the "PHS/Without Blood Labs" exam. Afterwards, the analysis results are entered in the MEC (Medical Equipment Computer)'s special IFEP software (In-Flight Examination Program).]

Sergey & Oleg completed the two-hour Part 2 of their second onboard "Profilaktika" (MBI-8, "Countermeasures") series of preventive health maintenance fitness testing on the treadmill, assisting each other in turn. *[Today's fitness test was performed on the TVIS in unmotorized (idle) mode, with free choice of speeds within the range permitted. The test investigates the action mechanism and efficiency of various countermeasures (currently VELO and TVIS) aimed at preventing locomotor system disorders in weightlessness. The test differs from the normal TVIS session by the use of the TEEM-100 gas analyzer (via a mask equipped with a pneumotachometer sensor), measurement of blood lactate level and subjective evaluation of physical exertion levels during the test. The lactate blood samples were taken twice at the end of the session, using the ACCUSPORT analyzer and REFLOTRON-4 accessories. Results were entered on a log sheet. TEEM and ECG (electrocardiograph) data were transferred to the RSE-Med laptop, also on a tape cassette (Cardiocassette-2000), and prepared for later downlink via Regul-Packet comm.]*

In the US Airlock (A/L), Garrett Reisman performed troubleshooting on the Avionics Rack (F1), assisted by Kononenko as required, going by an uplinked list of suggested steps with pictures. *[Yesterday Reisman successfully replaced the failed ATU-6 (Audio Terminal Unit #6) with a spare unit (which had six fasteners on the cold plate that were not present on the failed unit). Voice checks on the ATU-6 and ATU-4 units subsequently confirmed a successful R&R of the ATU-6 – it's working again. However, Reisman was unable to rotate the rack back into place afterwards. Today's crew timeline was modified to complete the rack rotation and A/L restowage in time to have the A/L properly configured for the 29P docking on Friday.]*

The FE-2 also performed a part of the scheduled adjustment of the MFCVs (Manual Flow Control Valves) for the ITCS/MTL (Internal Thermal Control System/Moderate Temperature Loop). The remaining work has been moved to tomorrow to make time for the higher-priority A/L F1 rack rotation & restowing. *[The MFCVs are being adjusted in the Lab with a battery-driven non-intrusive Flow Meter in preparation for the future Regenerative ECLSS (Environment Control & Life Support System). The recently activated OGS (Oxygen Generation System), launched in 2006, is one part of the new Regenerative ECLSS, required for the future six-person occupancy of the station. The second part, the WRS (Water Recovery System), for recycling wastewater into potable water, will be launched later this year on STS-126.]*

Working 2.5 hrs in the FGB, Sergey Volkov performed periodic SPOPT (Fire

Detection & Suppression System) maintenance by dismantling the FGB's IDZ-2 smoke detectors, cleaning their ionizing needles and then reinstalling the sensors. *[Part of the job is inspection and cleaning of surrounding areas behind panels. More SPOPT SD maintenance is scheduled tomorrow.]*

Sergey Volkov had ~3 hrs set aside for the annual inspection and photo-documentation of window panes in the SM. The observed defects were recorded in image and text files on the RSK1 laptop for subsequent downlink via U.S. OCA assets. *[Objective of the inspection, which uses a digital still camera (Nikon D1X w/SB-28DX flash) and voice recorder, was to assess the pane surfaces on SM windows 6, 7, 8, 12, and VP2 for any changes (new cavities, scratches, new or expanded old stains or discolorations affecting transparency properties) since the last inspection, performed by Oleg Kotov on 6/26/07. The new assessment will be compared to the earlier observations. Defects are measured with the parallax method which uses eyeball-sighting with a ruler and a right isosceles triangle to determine the defects' size and position with respect to the window's internal surface (parallax being the apparent change in an object's position resulting from changing the observer's position).]*

Oleg Kononenko meanwhile performed a 2-hr audit/inventory of Russian KRP food containers in the FGB, assessing the number of unopened food rations (expired or close-to-expiration) for helping ground specialists to plan upcoming flight manifests.

After FE-2 Reisman set up and configured the necessary equipment, including activating the A31p laptop for video packet/stream conversion, he and the CDR conducted "ping" tests of the TV downlink system in the SM, Soyuz and Node-1 for covering the Progress 29P docking on Friday. The A31p was later deactivated again. *[Objective of the testing was to check out the function of the digital video/ multicast downlink from the RS (Russian Segment) through Node-1 and USOS (US Segment) to Ku-band to MCC-Houston to COL-CC/Oberpfaffenhofen to TsUP-Moscow.]*

The FE-1 took the periodic sensor readings of the Russian "Pille-MKS" (MKS = ISS) radiation dosimetry experiment which has ten sensors placed at various locations in the Russian segment (DC1, SM starboard & port cabin windows, ASU toilet facility, control panel, etc.). *[Nine of the ten dosimeters are read manually.]*

Afterwards, Kononenko collected air samples in the SM & FGB using the AK-1M sampler kit, recording date, time & location and restowing the kits and pouches. Special AK-1M samples for Freon-218 were also taken in the SM.

Garrett performed the periodic checkup on active U.S. payloads, i.e., cleaning the ANITA (Analyzing Interferometer for Ambient Air) inlet plus inspecting and filter

cleaning of the CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) incubator payload. *[The CGBA incubator is controlled from the ground, with automatic video downlinked to Earth. ANITA is now back up again and running in support of the on-going Freon-218 scrubbing from the cabin air, collecting data every six seconds and downlinking the data daily to the ground team. ANITA monitors low levels of potential gaseous contaminants in the ISS cabin atmosphere with a capability of simultaneously monitoring 32 gaseous contaminants. The experiment is testing the accuracy and reliability of this technology as a potential next-generation atmosphere trace-gas monitoring system for ISS and future spacecraft. This is a cooperative investigation with ESA.]*

Oleg completed the routine maintenance of the SM's SOZh/ECLSS system, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

The FE-1 also performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR/MBI-8, FE-1/MBI-8) and RED resistive exercise device (FE-2).

Later tonight, Volkov will transfer the crew's exercise data file to the MEC for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At 11:25am EDT, Garrett conducted the periodic VHF-1 emergency communications check over NASA's VHF (Very High Frequency) stations, today at the Dryden (11:29:24am – 11:35:50am), talking with Houston/Capcom, MSFC/ PAYCOM (Payload Operation & Integration Center Communicator) and Moscow/ GLAVNI (TsUP Capcom) in the normal fashion via VHF radio from a handheld microphone and any of the USOS ATUs. *[Purpose of the test is to verify signal reception and link integrity, improve crew proficiency, and ensure minimum required link margin during emergency (no TDRS) and special events (such as a Soyuz relocation).]*

CEO (Crew Earth Observations) photo targets uplinked for today were **Arkenu 1 & Arkenu 2 Impact Craters, Libya** *(these two impact structures are thought to have been formed by the same impact event over 140 million years ago. The craters are located to the west of prominent rock outcrops within the extensive dune fields of southeastern Libya. Looking slightly to the left of track for the paired impact structures),* **Luquillo Forest, Puerto Rico** *(ISS had a nadir pass over this long term ecological research [LTER] site, and weather was predicted to be mostly clear. The site is comprised mainly of the forested slopes of the Luquillo Mountains in the eastern portion of Puerto Rico. Overlapping nadir frames, taken along track, were requested),* and **East Venezuela Land Use, S. America** *(the orbit track roughly paralleled the Venezuela coastline, providing an opportunity for context imagery of this land use change monitoring site. Looking to the right of track as ISS approached the northern coastline of Venezuela; the northern third of the site area should have been clear, with cloud cover increasing towards the south).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:31am EDT [= epoch]):*
Mean altitude -- 340.9 km
Apogee height -- 345.0 km
Perigee height -- 336.9 km
Period -- 91.35 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006022
Solar Beta Angle -- 42.4 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 53 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54321

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/14/08 -- Progress M-64/29P launch (4:23pm EDT)
05/16/08 -- Progress M-64/29P docking/FGB nadir (5:37pm)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:02pm EDT nominal)
06/02/08 -- STS-124/Discovery/1J docking (1:49pm)

Tentative STS-124 docked working timeline:

- *6/03 -- EVA-1 (11:30am, 6.5 hrs.), OBSS transfer, JPM prep, S3/S4 SARJ TBA install, JPM install*
- *6/04 -- JPM Vestibule outfitting, Reisman/Chamitoff handovers*
- *6/05 -- EVA-2 (11:30am, 6.5 hrs), JTVE install, JRMS cvr remv, NTA*

prep, CP 9 ETVCG retrv

- *6/06 -- JLP relocate to JPM; JLP Vestibule leak check*
- *6/07 -- JLP Vestibule outfitting*
- *6/08 -- EVA-3 (10:30am, 6.3 hrs), S1 NTA install, CP9 ETVCG install, JRMS cover remove*
- *6/09 -- JRMS checkouts, JLP Vestibule outfitting, A/L BCM R&R*
- *6/10 -- Sayonara (~4:00pm), hatch close (~4:30pm)*
- *6/11 -- Undocking (~9:04am); OBSS survey/inspection*
- *6/12 -- Mostly off-duty*
- *6/13 -- Stowing; deorbit preps*
- *6/14 -- Deorbit burn (~9:56am);*

06/14/08 -- STS-124/Discovery landing (KSC: ~10:59am EDT, nominal)
07/10/08 -- Russian EVA-20 (7/10-11)
??/??/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at

http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 05/13/08
Date:	Tuesday, May 13, 2008 12:40:27 PM
Attachments:	image001.gif

ISS On-Orbit Status 05/13/08

All ISS systems continue to function nominally, except those noted previously or below.

From the US voluntary “job jar” task list, after wakeup and before breakfast, FE-2 Reisman downloaded the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data from his Actiwatch to the HRF-1 (Human Research Facility 1) laptop. *[To monitor his sleep/wake patterns and light exposure, Garrett wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout this week, for the last time. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

CDR Volkov completed the periodic servicing of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The regen process will be terminated before sleeptime, at ~5:15pm EDT. Regeneration of bed #2 follows tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. In order to assist in atmosphere scrubbing after the Freon-218 (Khladon) spill from the SKV-2 air conditioner on 4/24, the BMP’s regeneration cycle was moded to 5 days instead of the regular 20 days.]*

In the SM (Service Module), FE-1 Kononenko took the periodic readings of potentially harmful atmospheric contaminants with the CMS (Countermeasure System) component of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, which uses preprogrammed microchips to measure H_2CO (Formaldehyde, methanal), CO (Carbon Monoxide) and NH_3 (Ammonia), taking one measurement per microchip. *[CMS is a subsystem of the Russian SKDS Pressure Control & Atmosphere Monitoring System.]*

After setting up the experiment equipment yesterday, Volkov & Kononenko completed the first part of the onboard “Profilaktika” (MBI-8, “Countermeasures”) preventive health maintenance fitness test on the VELO bicycle ergometer, assisting each other in turn. Part 2, on the TVIS treadmill, is scheduled tomorrow. *[Test procedure for MBI-8, which requires workouts on the VELO and TVIS, is identical to the Russian MO-5 assessment, but in addition to the nominal procedure it uses the TEEM-100M gas analyzer with breathing mask, a blood lactate test with the ACCUSPORT analyzer and REFLOTRON-4 accessories, and a subjective evaluation of physical exertion levels during the test (using the Borg Perceived Exertion Scale, viz., 10 steps from very light over hard and very hard to maximum). Results are entered on a log sheet. TEEM and ECG (electrocardiograph) data are transferred to the RSE-Med laptop, also on a tape cassette (Cardiocassette-2000), and prepared for later downlink via Regul-Packet comm. Results are also called down to specialists standing by at TsUP.]*

FE-2 Reisman had 30 min set aside to review procedures for tomorrow’s MFCV (Manual Flow Control Valve) adjustment activity, for which he charged up three HRF (Human Research Facility) and Flow Meter batteries yesterday. *[The MFCVs will be adjusted in the Lab in preparation for the future Regenerative ECLSS (Environment Control & Life Support System), using a non-intrusive Flow Meter instrument.]*

Afterwards, Reisman worked in the US Airlock, rotating the Avionics rack to gain access and performing troubleshooting on the ATU-6 (Audio Terminal Unit #6) in an attempt to regain the system or determine once and for all the possible cause of its current failures. *[ATU-6 has not performed satisfactorily despite repeated troubleshooting attempts dating back several months. Today’s attempt was the third since ATU-6 was installed by Clay Anderson on 10/11/07 in place of a failed unit, which was returned on 10A. The new ATU-6 has been experiencing periodic lockups and PBIT (passive built-in test) faults. Of the three ATUs in the A/L, at least one must be functional for EVAs so long as the suited EVA crew has established UHF (Ultra High Frequency) radio communication.]*

In preparation for Progress M-64/29P docking on 5/16 (Friday), Volkov & Kononenko completed the standard three-hour training course with the TORU teleoperator system, which provides a manual backup mode to the Progress’ KURS automated rendezvous radar system. Afterwards, Sergey & Oleg tagged up with TORU specialists at TsUP/Moscow via S-band audio. Another training review is scheduled on 5/15. *[The drill included procedure review, rendezvous, docking data and rendezvous math modeling data review, fly-around, final approach, docking and off-nominal situations (e.g., video or comm loss). Two modes were simulated on the RSK1 laptop: 29P from stationkeeping range (~170 m) in sunlight*

(insolation), and 29P in final approach in darkness (eclipse). The TORU teleoperator control system lets a SM-based crewmember perform the approach and docking of automated Progress vehicles in case of KURS failure. Receiving a video image of the approaching ISS, as seen from a Progress-mounted docking television camera ("Klest"), on a color monitor ("Simvol-Ts", i.e. "symbol center") which also displays an overlay of rendezvous data from the onboard digital computer, the CDR would steer the Progress to mechanical contact by means of two hand controllers, one for rotation (RUO), the other for translation (RUD), on adjustable armrests. The controller-generated commands are transmitted from the SM's TORU control panel to the Progress via VHF radio. In addition to the Simvol-Ts color monitor, range, range rate (approach velocity) and relative angular position data are displayed on the "Klest-M" video monitor (VKU) which starts picking up signals from Progress when it is still approximately 8 km away. TORU is monitored in real time from TsUP over Russian ground sites (RGS) and via Ku-band from Houston, but its control cannot be taken over from the ground. On 5/16, Progress KURS will be activated at 4:04pm EDT on Daily Orbit 16 (DO16), SM KURS two minutes later. Progress headlight will be switched on at a range of ~8 km. Flyaround to the FGB nadir docking port (~400 m range, in sunlight) starts at 5:14pm. Start of final approach: 5:27:30pm (DO1). Local sunset: ~5:34pm. Estimated time of contact: 5:36:30pm.]

Later, on DO13 over RGS (Russian Groundsite) VHF, the two cosmonauts conducted the standard pre-docking test of the TORU, including the BPS Signal Conversion Unit in the SM as well as its RUO & RUD hand controllers. *[The elaborate testing of the digital video/multicast downlink of the 29P docking via RS (Russian Segment) to USOS (US Segment) to Ku-band to MCC-Houston to COL-CC/Oberpfaffenhofen to TsUP-Moscow is scheduled tomorrow.]*

In further troubleshooting of the Russian SRVK-2M Condensate Water Processor, Kononenko checked the performance of the liquid/air separators of the Condensate Separation & Pumping Units BRPK-1 & -2, using a water-filled EDV container. The activity was supported by ground specialist tagup. *[The units have failed to show "filled", "empty" and NOK pump "shutdown" indicators as required, causing liquid to pass through the air connections of the separators.]*

The CDR completed the routine maintenance of the SOZh/ECLSS system in the Service Module (SM), including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Volkov also performed the daily IMS (Inventory Management System) maintenance,

updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), RED resistive exercise device (FE-2) and VELO bike with bungee cord load trainer (CDR/MBI-8, FE-1/MBI-8).

Later tonight, Garrett will download the crew’s exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~9:45am EDT, Volkov, Kononenko & Reisman joined in two separate televised PAO interview events, one with the Parsippany, NJ Daily Record (Lorraine Ash), the other with CNN Radio (Mike Jones/Christy Henry/Marcia Shipley). *[Parsippany, New Jersey is Garrett’s hometown.]*

At ~11:05am, the crew conducted the standard pre-mission teleconference with members of the STS-124/1J Shuttle crew, via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC (Station Support Computer) laptop]*.

The three crewmembers had their regular periodic PMCs (Private Medical Conferences) via S- & Ku-band audio/video.

At ~2:10pm, Garrett Reisman is scheduled for his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

At ~5:20pm, just before sleep time, Oleg will again set up the Russian MBI-12 SONOKARD (Sonocard) payload and start his second experiment session, using a sports shirt from the SONOKARD kit with a special device in the pocket for testing a new method for acquiring physiological data without using direct contact on the skin. Measurements are recorded on a data card for return to Earth. Sergey will start his second MBI-12 session tomorrow evening. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember’s physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

VolSci Program: For the Voluntary Science program on the weekend ahead (5/17-5/18), Garrett Reisman was offered two choices for his selection: (1) an "operations improvement" session with SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellites) with all three satellites (single-satellite experiments to test new thrusting algorithms and demonstrate safe trajectories for the inspection of space structures; two-satellite experiments to introduce new controllers and on-line path planning tools for purpose of docking to a complex tumbling satellite; three-satellite runs for formation flight experiments to test initialization of a formation and obstacle avoidance; (2) an EPO (Education Payload Operations) Demo on Space Careers, creating an educational video discussing different careers found at NASA, to be used to produce an educational product to enhance existing education resources for students in grades 9-12. Garrett's choice is required by tonight.

Microbial Water Sampling Results: Results of the sample analysis from the five transferred STS-123/1J/A CWCs (Contingency Water Containers) are now available. The samples from two potable water CWCs (#1094, #1095) and three technical water CWCs (#1043, #1071, #1070) have exhibited no bacterial, coliform or fungi growth after standard incubation periods. One of the three technical water CWC samples indicated some bacterial growth but at a level within the potable water acceptability limit. The Wautersia bacteria of this sample are typical water-borne microorganisms that have been seen previously in ISS water sources. These isolates pose no threat to human health.

Progress M-64/29P Update: At Baikonur, Kazakhstan, the Commission in charge meets tonight to decide on the Go/No Go for tomorrow's Progress launch. The vehicle is currently undergoing final L-1 day preparations on Launch Pad 1 (**see photo below**). Launch is set for 4:23pm EDT, followed by orbital insertion at 4:31:39pm. There will be three midcourse correction burns (DV1: 5/14 - 7:58pm; DV2: 5/14 - 8:39pm; DV3: 5/15 - 5:06pm). Six more course adjustment "tweaks" will be executed later as required. The Progress KURS-A will be activated Friday afternoon at 4:04pm on Daily Orbit 1 (DO1), followed 2 minutes later by activation of the SM KURS-P transponders on the ISS. Video link and 29P floodlight activation is at ~8 km distance (4:57pm, 5/16); flyaround in sunlight at ~400 m range starts at ~5:14pm, stationkeeping at ~170 m at 5:23pm, final approach at 5:27:30pm and docking at FGB nadir port at ~5:37pm. Orbital sunset occurs at ~5:35pm.

CEO (Crew Earth Observations) photo targets uplinked for today were **Teide Volcano, Canary Islands** *(located on the island of Tenerife, the Teide stratovolcano is the highest point in the Atlantic Ocean. It is located within a large elliptical collapse caldera [La Canada], and was perhaps witnessed in eruption by Christopher Columbus. Looking to the left of track for the islands; a mapping series*

of the islands as ISS passed was requested), **Vredefort Impact Crater, South Africa** *(looking slightly to the left of track for this 300-km in diameter impact structure, which was formed over 2 billion years ago. Despite its great age, some rocks deformed by the impact are still present, suggesting the circular outline of the original structure. Overlapping frames of the crater and surrounding area were requested to provide context for higher resolution imagery),* and **Johnston Island reef, Central Pacific** *(weather was predicted to be clear over Johnston Island and its associated reefs. Johnston Island is mostly barren and covered only with low vegetation consisting of herbs. A runway is also visible on the island. High resolution imagery of the islands and nearby reefs is requested to monitor island morphology and reef extent)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

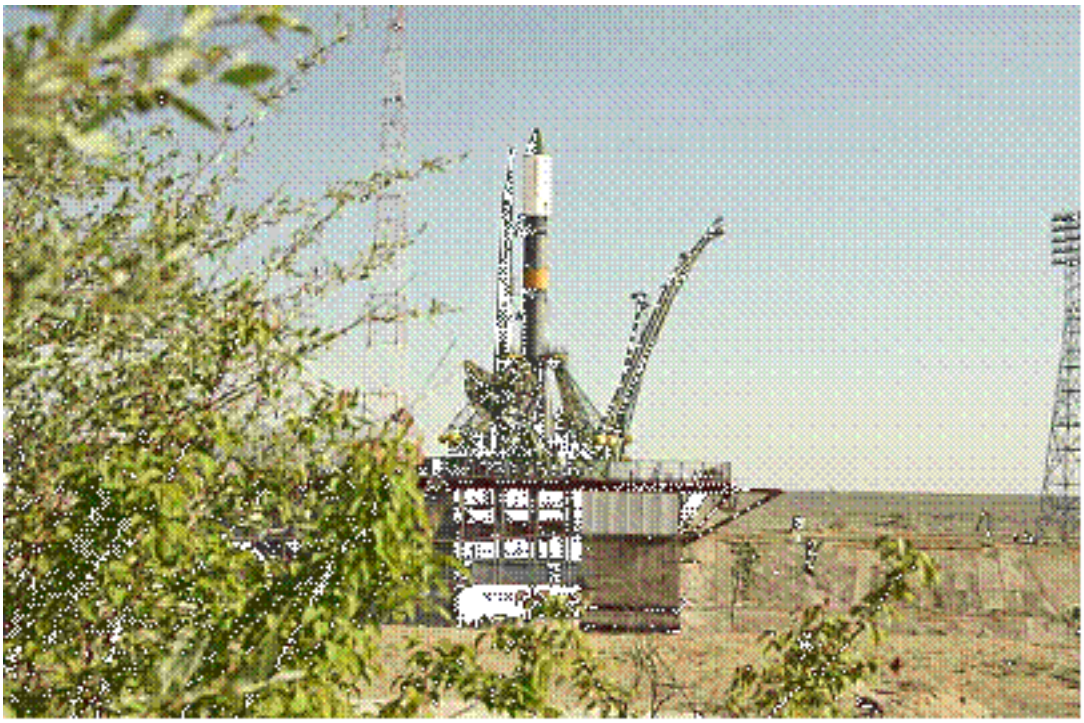
ISS Orbit *(as of this morning, 8:09am EDT [= epoch]):*
Mean altitude -- 341.0 km
Apogee height -- 345.2 km
Perigee height -- 336.8 km
Period -- 91.35 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006252
Solar Beta Angle -- 37.5 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 48 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54305

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/14/08 -- Progress M-64/29P launch (4:23pm EDT)
05/16/08 -- Progress M-64/29P docking/FGB nadir (5:37pm)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:02pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
06/14/08 -- STS-124/Discovery landing (KSC: ~11:02am EDT)
07/10/08 -- Russian EVA-20 (7/10-11)
??/??/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)

10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

Progress M-64/29P with Soyuz launcher at Baikonur, 5-13-08



From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 05/12/08
Date:	Monday, May 12, 2008 12:09:41 PM
Attachments:	

ISS On-Orbit Status 05/12/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 4 of Increment 17.*

From the US voluntary "job jar" task list, after wakeup and before breakfast, FE-2 Reisman downloaded the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data from his Actiwatch to the HRF-1 (Human Research Facility 1) laptop. *[To monitor his sleep/wake patterns and light exposure, Garrett wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout this week, for the last time. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

CDR Volkov and FE-1 Kononenko set up the hardware for and tagged up with ground specialists in preparation of their first onboard "Profilaktika" (MBI-8, "Countermeasures") preventive health maintenance fitness test, scheduled to start tomorrow on the VELO cycle and running through Wednesday. Activities included a test gas analysis of exhaled air and a health check of the Cardiocassette (KK-2000). *[Test procedure for MBI-8, which requires workouts on the VELO and TVIS, is identical to the Russian MO-5 assessment, but in addition to the nominal procedure it uses the TEEM-100M gas analyzer with breathing mask, a blood lactate test with the ACCUSPORT analyzer and REFLOTRON-4 accessories, and a subjective evaluation of physical exertion levels during the test (using the Borg Perceived Exertion Scale, viz., 10 steps from very light over hard and very hard to maximum). Results are entered on a log sheet. TEEM and ECG (electrocardiograph) data are transferred to the RSE-Med Laptop, also on a tape cassette (KK-2000), and prepared for later downlink via Regul-Packet comm. Results are also called down to specialists standing by at TsUP.]*

After turning on ventilation fans in the JPL (Japanese Experiment Module

Experiment Logistics Module Pressurized Section), in case of CO_2 pockets, the FE-2 took situational photography of current stowage arrangements in the module, such as hard dummy panels, JTVE (JEM Television Equipment) booms, jettison stowage bags, etc.

Afterwards, Reisman performed the periodic JLP status & shell temperature check from the MKAM (Minimum Keep-Alive Monitor) panel and calldown of the temperatures via S-band. Later, the fans were deactivated again.

After configuring the PFE-OUM (Periodic Fitness Evaluation - Oxygen Uptake Measurement) equipment at the HRF-2 (Human Research Facility 2) rack, Reisman conducted his second PFE-OUM session on the CEVIS (Cycle Ergometer with Vibration Isolation) while wearing an HRM (Heart Rate Monitor), with Sergey Volkov as operator to obtain measurements of the subject. *[The equipment includes the HRF PFM/PAM (Pulmonary Function Module/Photoacoustic Analyzer Module), Mixing Bag System and GDS (Gas Delivery System). After calibration of the DPFM (Differential Pressure Flowmeter), Garrett, assisted by Sergey, worked through the protocol, changing the loads on the ergometer and recording data. Later, the FE-2 updated the evaluation protocol, deactivated & stowed the gear, and powered down the PFE-OUM laptop. Purpose of PFE-OUM is to measure aerobic capacity during exercise within 14 days after arrival on ISS, and once monthly during routine PFEs. The data allows exercise physiologists & flight doctors to assess the crew's health & fitness and to provide data for modifying & updating crew-specific exercise regimes. By hooking up a special cable, continuous oxygen uptake measurements can now be taken while riding the CEVIS without requiring access to the CEVIS control panel as before. PFE-OUM is a collaborative effort between NASA and ESA (European Space Agency).]*

Kononenko & Volkov continued the transfer & installation in the FGB of the new stowage enclosures delivered by the ATV1 (Automated Transfer Vehicle 1), which were built in Russia to provide more efficient stowage spaces behind FGB panels and improve airflow/circulation. *[Oleg transferred the components for one container and installed it in FGB zone 36 (behind panels 114-155), while Sergey later equipped FGB zones 31 (panel 420) and 32 (panel 422) with enclosures.]*

Preparatory to the planned troubleshooting of the ATU-6 (Audio Terminal Unit #6), scheduled tomorrow, Reisman installed pivot pin fittings in the Airlock Avionics rack, required to allow rack rotation away from the hull for ATU access. *[ATU-6 has not performed satisfactorily despite repeated troubleshooting attempts dating back several months. ATU-6 was installed by Clay Anderson on 10/11/07 in place of a failed unit, and the failed ATU-6 was returned on 10A. The new ATU-6 has been experiencing periodic lockups and PBIT (passive built-in test) faults. Of the three*

ATUs in the A/L, at least one must be functional for EVAs so long as the suited EVA crew has established UHF (Ultra High Frequency) radio communication.]

Volkov & Reisman took their second CHeCS emergency medical operations OBT (On-Board Training) drill, a 30-min. exercise to refresh their CMO (Crew Medical Officer)'s acuity in applying ACLS (advanced cardio life support) in an emergency. Sergey's proficiency drill today focused on eye treatment, Garrett's on nosebleed treatment. *[The HMS (Health Maintenance Systems) hardware, including ACLS equipment, may be used in contingency situations where crew life is at risk. To maintain proficiency, crewmembers spend one hour per month reviewing HMS and ACLS equipment and procedures via the HMS and ACLS CBT (computer-based training). The training drill, each crewmember for him/herself, refreshes their memory of the on-orbit stowage and deployment locations, equipment etc. and procedures.]*

Continuing the current round of monthly preventive maintenance of RS ventilation systems, Oleg Kononenko cleaned the four "Group B" fan screens (VT1, VTK1, VV1RO & VV2RO) in the SM.

In preparation for the planned MFCV (Manual Flow Control Valve) adjustment activity scheduled on 5/14 (Wednesday), Garrett charged three HRF (Human Research Facility) and Flow Meter batteries. *[The MFCVs will be adjusted in the Lab in preparation for the future Regenerative ECLSS (Environment Control & Life Support System). Today's recharging involved two external HRF batteries and one internal battery of the Non-Intrusive Flow Meter instrument.]*

Volkov conducted the periodic (monthly) functional closure test of the Vozdukh CO_2 removal system's spare emergency vacuum valves (AVK), in the spare parts kit. *[The AVKs are critical because they close the Vozdukh's vacuum access lines in the event of a malfunction in the regular vacuum valves (BVK) or a depressurization in the Vozdukh valve panel (BOA). Access to vacuum is required to vent CO_2 during the regeneration of the absorbent cartridges (PP). During nominal operation, the AVK valves remain open.]*

The FE-2 completed the routine maintenance of the SOZh/ECLSS system in the Service Module (SM), including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

The FE-1 performed the daily IMS (Inventory Management System) maintenance,

updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

In preparation for 1J/A arrival and the docking of the JPM (Japanese Pressurized Module) “Kibo” with its RMS (Remote Manipulator System), Reisman installed the CBCS (Centerline Berthing Camera System) at the Node-2 Port hatch, powered it up and checked it out. Afterwards, he disconnected the CBCS electronics cables to avoid hatch “dragthroughs”. *[Should there be any changes to the CBCS configuration between now and 1J, another CBCS checkout may be required. JPM will be transferred from the Shuttle cargo bay with the SSRMS (Space Station Remote Manipulator System) on FD4 (Flight Day 4) of Mission STS-124/1J and berthed at the Node-2 Port CBM (Common Berthing Mechanism) during EVA-1 (of three EVAs) by Ron Garan (EV1) & Mike Fossum (EV2). The JLP will be relocated on FD7 to its final place atop the JPM, also with the SSRMS.]*

Reisman also conducted the periodic (every two weeks) inspection of the RED (Resistive Exercise Device) canister bolts for re-tightening if required.

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-1, FE-2/PFE), TVIS treadmill (CDR, FE-1), and RED (FE-2).

Later tonight, the FE-2 will download the crew’s exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~12:20pm EDT, Garrett supported TV downlink exchanges with students at two US educational institutions,- One Stop Richmond Hill Community Center in Richmond Hill, NY, and Valley Christian Elementary School in Bellflower, CA. *[“What is your favorite topic of conversation on the ISS?”; “What language do you all speak on the ISS?”; Why do you need to know a crewmember’s physiological functions during sleep?”; “What have you learned so far working with the Crew Earth Observations program?”; “How comfortable is it so sleep in microgravity?”]*

At ~3:10pm, the three crewmembers will convene for their standard bi-weekly teleconference with the JSC Astronaut Office (Steve Lindsey), via S-band S/G-2 audio & phone patch.

Water Dump Update: The US condensate water venting planned for 5/18 has been postponed to 5/26, but alternative options are being worked by the partners (such as storing the surplus water in clean ATV tanks). With the Russian SRVK

(Condensate Processing Unit) currently off (since 5/6), condensate produced by the US Lab CCAA (Common Cabin Air Assembly) air conditioner cannot be processed as usual, but Russian specialists are confident of success of upcoming SRVK troubleshooting.

MT Transfer: For today's MT (Mobile Transporter) translation, Russian thrusters were inhibited at 11:40am (through 5:50pm) due to loads constraints. At ~12:05pm, ground controllers started driving the railcart from WS-4 (Worksite #4) out to WS-6 (through 2:05pm) using string A IMCAs (Integrated Motor/Controller Assemblies) and then back to WS-4 at 3:05pm (through 5:05pm) on string B IMCAs, in order to confirm power & data redundancy at WS-6 before the 1J/docked mission.

Progress 29P Update: RSC-Energia/Moscow reported that the Soyuz launcher with the next Progress cargo ship, M-64/29P, has been moved this morning to the launch pad (launch: 5/14, 4:23pm EDT). L-2 Day activities have started. After reviewing ISS state of readiness, the joint IMMT (ISS Mission Management Team) this morning gave the Go for the docking on 5/16 (5:37pm EDT, two minutes after local sunset).

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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07/10/08 -- Russian EVA-20 (7/10-11)
??/??/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
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11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 05/11/08
Date:	Sunday, May 11, 2008 1:49:45 PM
Attachments:	

ISS On-Orbit Status 05/11/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – crew off duty. Ahead: Week 4 of Increment 17.*

CDR Volkov conducted the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including ASU toilet facilities systems/replaceables, the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP and today also the periodic cleaning of the pre-filter of the POTOK air filtration system. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

FE-2 Reisman performed the periodic offloading of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1062) with the collected water slated for processing. No samples were required. *[Transferred quantity is determined by allowing tank and CWC equalize with each other. Tank quantity stabilizes at a value higher than the neutral point.]*

Garrett Reisman also unstowed and set up the PFE-OUM (PFE-Oxygen Uptake Measurement) equipment on the HRF-2 (Human Research Facility 2) rack, including the HRF PFM/PAM (Pulmonary Function Module/Photoacoustic Analyzer Module), Mixing Bag System and GDS (Gas Delivery System), for his second PFE-OUM protocol session tomorrow. *[The PFE-OUM experiment, using the CEVIS ergometer for workout, demonstrates the capability of crewmembers to perform periodic fitness evaluations with continuous oxygen consumption measurements within 14 days after arrival on ISS, and once monthly during routine PFEs. Once the capability of the pulmonary function system (PFS) to perform PFEs is verified, crewmembers will be able to integrate their monthly PFE with oxygen consumption measurements to fulfill the requirement for cardiovascular fitness evaluations during*

long-duration space flight.]

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR), RED resistive exerciser (CDR, FE-1 FE-2) and VELO bike with bungee cord load trainer (FE-1). *[The RED, as an anaerobic muscle exerciser, allows a variety of routines: squat, heel raises, bent-over rowing, abdominal crunches, deadlift, bench presses, upright rowing, etc. For Sergey & Oleg, who are using RED three times a week, each session features four different routines which vary from day to day to target different muscle groups.]*

Working off the discretionary "time permitting" task list, Sergey Volkov completed another EKON KPT-3 session, making observations and taking aerial photography of environmental conditions for Russia's Environmental Safety Agency (EKON) using the Nikon D2X digital camera with SIGMA 300-800mm telephoto lens.

Also from the suggestions list, Kononenko performed a session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program, using the D2X to take telephotos of the Chaiten volcano eruption in Chile and of the Kuril Islands in nadir.

A third job on the discretionary task list was Oleg's second run of the Russian DZZ-2 "Diatomeya" ocean observations program, using the NIKON F-5 digital still camera with 80-200 mm lens and the SONY PD-150P camcorder from SM windows 7 & 8 to record color bloom patterns in the ocean, sudden changes in cloud cover pattern, swirls, wakes of subsurface waves (sections of parallel bands), water level drop, and smoothing lanes in wave fields. *[Targets today in the North Atlantic were the Newfoundland Island coastline, West Saharan offshore areas, US coastal area, Amazon river runoff and offshore area of Brazil.]*

At ~1:25pm EDT, Reisman had for his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop). *[Main topic for today's phone chat undoubtedly was Mother's Day.]*

Tonight, Garrett will start his last required overnight run with the SLEEP experiment (Sleep-Wake Actigraphy & Light Exposure during Spaceflight), consisting of data logging on the HRF-1 laptop within 15 minutes of awakening for 7 consecutive days, as carried for him on the voluntary "job jar" task list. Any additional SLEEP logging after fulfilling the required week's readings will be appreciated by the PI (Principal Investigator). *[To allow ground study of his sleep/wake patterns and light exposure, Garrett wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition.]*

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this “Gateway” website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:43am EDT [= epoch]):*
Mean altitude -- 341.1 km
Apogee height -- 345.5 km
Perigee height -- 336.7 km
Period -- 91.36 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006526
Solar Beta Angle -- 27.6 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 46 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54273

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/14/08 -- Progress M-64/29P launch (4:23pm EDT)
05/16/08 -- Progress M-64/29P docking/FGB nadir (5:38pm)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS (5:02pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
06/14/08 -- STS-124/Discovery landing (KSC: ~11:02am EDT)
07/10/08 -- Russian EVA-20 (7/10-11)
??/??/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking

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3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 05/10/08
Date:	Saturday, May 10, 2008 4:30:55 PM
Attachments:	

ISS On-Orbit Status 05/10/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – day off for CDR Volkov, FE-1 Kononenko & FE-2 Reisman.*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the Service Module (SM) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

As part of the house cleaning, Volkov & Kononenko performed regular maintenance cleaning on the fan grilles FS5, FS6, VPkhO, VdPrK, VPrK & TsV2 in the DC1 Docking Module and FGB *(Funktsionalnyi-Grusovoi Blok)*.

The CDR conducted the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Sergey also gathered weekly data on Total Operating Time & “On” durations of the Russian POTOK-150MK (150 micron) air filter unit of the SM’s SOGS air revitalization subsystem for reporting to TsUP.

At ~10:00am EDT, the crewmembers held their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP/Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit

events.

The crew conducted their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exerciser (FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

Later, Garrett downloaded the crewmembers' exercise data files to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Working off the discretionary "time permitting" task list, Volkov completed another EKON KPT-3 session, making observations and taking aerial photography of environmental conditions for Russia's Environmental Safety Agency (EKON) using the Nikon D2X digital camera with SIGMA 300-800mm telephoto lens.

Also from the suggestions list, Kononenko performed a session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program, using the D2X to take telephotos of the western slope of the Pyrenees, the Chaiten volcano eruption in Chile as well as of the Kurils Islands in nadir.

A third job on the discretionary job list for the two cosmonauts, as per request from the European partner, still is to take one or two photographs of a Russian crewmember inside the ATV "Jules Verne".

Newly added to the "available time" list was a request to take close-up photography of the two SKK materials exposure payloads mounted on the outside of the station,- SKK-2 on the "Pirs" Docking Compartment (DC-1) from SM window #6, and SKK-9 on the SM hull, from the DC-1 EVA hatch window.

CDRA Update: The Carbon Dioxide Removal Assembly, running since 5/7, was deactivated yesterday by ground commanding after data from the ANITA (Analyzing Interferometer for Ambient Air) instrument showed that CDRA wasn't helping to remove the Freon-218 from the cabin air. The likely cause is that the pore size of the Zeolite bed in CDRA is smaller than Freon molecules, thus preventing the refrigerant from being adsorbed. *[The Freon spill (~600 g) occurred on 4/29 after the replacement of the SKV-2 air conditioner compressor. To clean up quickly, the Russian BMP (Russian Harmful Impurities Removal System) was moded to regenerate its absorbent beds every 5 days instead of the regular 20 days. Freon-218 (Octafluoropropane/C_3F_8, Russian: Khladon) is safe (low toxicity, perhaps some irritation) and noncorrosive if not heated above ~600 degC. Primary hazard is*

oxygen displacement, as witness the Ozone Layer, but there is not enough C_3F_8 on board the ISS to significantly deplete any atmospheric oxygen.]

Water Dump Update: The US condensate water venting planned for 5/18 has been cancelled, as alternative options are being worked (such as storing the surplus water in clean ATV tanks).

PPS P6 Reconditioning Update: The reconditioning (discharge/recharge) maintenance of the P6 battery sets 2B3 and 4B3 was completed on 5/7, and both were returned to nominal operations. *[P6 battery sets 2B2 & 4B2 were reconditioned last January.]*

MSG Update: The annual re-certification of the Microgravity Science Glovebox was successfully completed.

Weekly Science Update *(Expedition Seventeen -- Week 3)*

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Measurements continue in FGB module. Inc16 science data returned on 15S, waiting for hand-over to science team.

ANITA: Completed.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): B3/B4 plants are growing. A1/B1 and A2/B2 swapping was done, but the attempt to hydrate A1 and A2 in the B1 and B2 position is not currently successful.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): Complete.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed. Inc16 science data returned on 15S, waiting for hand-over to science team.

EuTEF (European Technology Exposure Facility): The experiment platform continues to operate nominally. - DEBIE-2: Link error still under investigation;- DOSTEL: On-going science acquisition;- EuTEMP: Currently inactive as planned; EVC: Further troubleshooting is on-going; Still problems to get high-rate data downlink; - EXPOSE: On-going science acquisition; - FIPEX: New science acquisition script has been restarted successfully on 4/30 and terminated nominally on 5/6. A new script was uplinked on 5/7 and is running since then; - MEDET: On-going science acquisition, running nominal; PLEGPAY: Instrument is powered on, but not in science acquisition mode; TRIBOLAB: On 4/25, the very sensitive TRIBOLAB Pin On Disk#2 (POD#2) run could be restarted and ran nominally until 5/9. The instrument has been put in Thermal Stabilization Mode (TSM) to prepare for an attempt to restart the Pin On Disk#1 (POD#1) run.

FSL (Fluid Science Laboratory): FSL MIL Bus cable repair was successfully performed on 5/5. After FSL Rack Activation from ground on 5/8, the ground confirmed that the FSL cables repair activities were successful. “Thank you Garrett for your great work! Teams continue to analyze on ground the Telemetry Logs, and further troubleshooting activities will be required with CEM-U (Upper) Optical Module.”

GEOFLOW: Start of GEOFLOW is pending further FSL troubleshooting and remaining commissioning activities (check of FSL optical modes).

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System):

Complete.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION/REPOSITORY: In progress.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Inc16 samples have been downloaded with 15S and handed over to science team.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): “Garrett you have a couple of Sleep Activities scheduled for next week. You will have your monthly download and your last week of required Sleep logs scheduled as well. Any additional Sleep logging is above and beyond and greatly appreciated by the PI. After these activities are complete, you will have one more download and an Actiwatch doff on the Shuttle as your remaining activities.”

SOLAR (Solar Monitoring Observatory): Initial Sun tracking was started on 4/29, but the Sun was not in the proper Beta range to allow for nominal data acquisition, i. e. SOLAR platform went to Stand-By Mode when trying to track the Sun. On 4/30, solar measurements started with SOVIM and SOLSPEC instruments with regular acquisition of spectra and calibration runs. During this Sun observation period, the SOLAR platform, SOVIM and SOLSPEC Sun sensors positions have been correlated during a so-called “criss-cross” procedure manoeuvre. The current Sun observation period will end during this weekend. - SOVIM: Acquiring science data – some glitches observed in the instrument telemetry; - SOLSPEC: Acquiring science data; - SOLACES: Acquiring science data, some recurrent synchronization problems between its microcontrollers.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite):

In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): The 4 ECs (Experiment Containers) of Rotor B are yet to be retrieved by the crew from the blocked Rotor B. The first troubleshooting activity, which consists to insert back 6 Reference ECs into the Rotor A, is currently planned for next week.

CEO (Crew Earth Observations): Through 5/5 the ground has received a total of 982 of ISS/CEO images for review and cataloging. "We are currently reviewing imagery with camera times corresponding to the following target list requests: Santa Barbara Coast, California — preliminarily acquired; and the Madrean Sky Islands, Mexico — not acquired. We have seen a number of photos suggesting your attempts to acquire the cities you requested, especially for Cologne, Germany — but there is no success so far to report. Your recent imagery of the New Orleans-Mississippi River-Lake Pontchartrain DYNAMIC EVENT (opening of the Bonnet Carre Spillway upriver from the city) will be published on NASA/GSFC's Earth Observatory website this weekend. Thanks for a great context view of this man-made event!"

CEO photo targets uplinked for today were **Ouarkziz Impact Crater, Algeria** *(this 3.5-km in diameter impact structure stands out among the folded rocks of the Ouarkziz Monocline due to its well-defined circular crater. ISS had a nadir pass directly over the impact structure. Overlapping frames, using the 400 mm lens, acquired as ISS traversed the mountains from NW to SE were suggested to image both the crater and surrounding geologic structure),* and **Galeras Volcano, Columbia** *(the Galeras stratovolcano is located immediately west of the city of Pasto, and is one of Columbia's most active volcanoes. Numerous small to moderate eruptions have taken place since the first Spanish conquistadores arrived. ISS had a nadir pass directly over the volcano, and some cloud cover may have been present. Imagery of the volcano and surrounding deposits was requested)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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06/14/08 -- STS-124/Discovery landing (KSC: ~11:02am EDT)
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??/??/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/05/08 -- ATV1 undocking
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1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	HQ-DL-ISS-Daily; iss-daily-external@lists.hq.nasa.gov;
CC:	
Subject:	ISS On-Orbit Status 05/09/08
Date:	Friday, May 09, 2008 10:51:47 AM
Attachments:	

ISS On-Orbit Status 05/09/08

All ISS systems continue to function nominally, except those noted previously or below. *Off-duty holiday for the crew: Russia's **Victory Day**, one of the most sacred national holidays for the Russian people, commemorating the dozens of millions of their countrymen fallen in the Great Patriotic War (World War II).*

FE-2 Reisman began the day with the periodic (monthly) CSA-CP (Compound Specific Analyzer-Combustion Products) maintenance/checkout, today changing out the battery on the prime unit. *[The CSA-CP is a passive cabin atmosphere monitor that provides quick response capability during a combustion event (fire). Its collected data are stored on a logger. After replacing the battery with a new one (#1119), Garrett zero-calibrated the instrument (to eliminate drift in the combustion sensors), then redeployed the prime unit at the SM (Service Module) Central Post.]*

Afterwards, Reisman also used the hand-held CDMK (Carbon Dioxide Monitoring Kit, #1002) to collect measurements for the regular atmospheric status check for $ppCO_2$ (Partial Pressure Carbon Dioxide) in the Lab, SM (at panel 449) and COL (Columbus Orbital Laboratory), and recording CO_2 readings and battery "ticks".

[Batteries were to be replaced if necessary. After all readings were taken, the CDM was deactivated and returned to its stowage place at LAB1S2.]

CDR Volkov conducted the daily routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Working off the discretionary "time permitting" task list, Volkov completed another ECON KPT-3 session, making observations and taking aerial photography of environmental conditions for Russia's Environmental Safety Agency (ECON) using the Nikon D2X digital camera with SIGMA 300-800mm telephoto lens.

Also from the suggestions list, FE-1 Kononenko performed a session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program, using the NIKON D2X to take telephotos of mainland, coastal areas and both shores of Sakhalin Island, as well as of the Kuril Islands in nadir.

A third job on the discretionary task list for the two cosmonauts, as per request from the European partner, was to take one or two photographs of a Russian crewmember inside the ATV “Jules Verne”.

The FE-2 filled out the regular FFQ (Food Frequency Questionnaire), his seventh, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA/ ESA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

Garrett also performed the regular bi-weekly reboot of the SSC (Station Support Computer) File Server laptop.

The crew is conducting their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exerciser (FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

Later tonight, Garrett will download the crew’s exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

MSS Update: Mobile Service System (MSS) performance yesterday was completely nominal, with Reisman completing SSRMS (Space Station Remote Manipulator System) operations well ahead of schedule. The next MSS operations are scheduled on 5/12 (Monday) when ground controllers translate the MT (Mobile Transporter) railcart from WS-4 (Worksite #4) out to WS-6 and then back to WS-4, in order to confirm power & data redundancy at WS-6 before the 1J/docked mission. SSRMS & MBS (Mobile Base System) pre-launch checkout operations are scheduled to be completed on 5/20 & 5/21.

Condensate Processing Update: After some more fruitless troubleshooting

yesterday to check on the functionality of the NOK-1 condensate evacuation pump working with the BRPK1 & BRPK2 Condensate Separation & Pumping Units, Sergey and Oleg were told to deactivate NOK-1 and stand down while ground specialists continue to assess the results for developing the next steps.

CEO (Crew Earth Observations) photo targets uplinked for today were **Tin Bider Impact Crater, Algeria** *(ISS had a nadir pass over this 6-km diameter impact structure. Looking for a circular crater located at the SW margin of a mountain range between the Grand Erg Oriental and Tifernine dune fields. Overlapping frames, taken along track, should have captured the crater),* **Mount Nyiragongo, Dem. Rep. of Congo** *(looking to the left of track for this notorious volcano, responsible for many deaths when a lava lake drained catastrophically in 1977. Actually a volcanic complex, the low profile of a neighboring shield volcano, Nyamuragira, contrasts with the 3470-m-high Nyiragongo stratovolcano. Looking to the left of track for two lakes [Edwards and Kivu] - the volcano and associated lava flows are located between the lakes. Some scattered clouds were expected),* and **Chaiten Volcano, Chile** *(Dynamic Event. Looking to the right of track as ISS passed over the coastline of Chile for this newly-active volcano. Dormant for the past 9000 years, Chaiten began erupting spectacularly last week, and has caused the evacuation of over 4000 people from the nearby town of Chaiten. Imagery of the volcano - visible as a light gray circular domed area in the midst of rugged hills - and any plumes [if present] was requested)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 4:51am EDT [= epoch]):*
Mean altitude -- 341.2 km
Apogee height -- 345.6 km
Perigee height -- 336.8 km
Period -- 91.36 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.000656
Solar Beta Angle -- 17.7 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 95 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54240

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/14/08 -- Progress M-64/29P launch (4:23pm EDT)
05/16/08 -- Progress M-64/29P docking/FGB nadir (5:38pm)

05/31/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
??/??/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	HQ-DL-ISS-Daily; iss-daily-external@lists.hq.nasa.gov;
CC:	
Subject:	ISS On-Orbit Status 05/08/08
Date:	Thursday, May 08, 2008 1:54:08 PM
Attachments:	

ISS On-Orbit Status 05/08/08

All ISS systems continue to function nominally, except those noted previously or below. *Hint:* ***watch tonight's "The Colbert Report"*** *on Comedy Central, at 11:30pm EDT! (see below)*

Before breakfast, CDR Volkov, FE-1 Kononenko and FE-2 Reisman began their workday with the periodic session of the Russian biomedical routine assessments PZEh-MO-7/Calf Volume Measurement (second for CDR & FE-1, third for FE-2. *[Calf measurements (left leg only) are taken with the IZOG device, a custom-sewn fabric cuff that fits over the calf, using the knee and lower foot as fixed reference pints, to provide a rough index of deconditioning in zero-G and effectiveness of countermeasures.]*

The FE-1 serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out" cycle to vacuum on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~5:15pm EDT. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. Filter bed 1 was regenerated yesterday. In order to assist in atmosphere scrubbing after the Freon-218 spill from the SKV-2 air conditioner on 4/29, the BMP's regeneration cycle was moded to 5 days instead of the regular 20 days.]*

Kononenko set up the equipment for his first session with the Russian experiment MBI-18 DYKHANIE ("respiration", "breathing"), then conducted the session, controlled from the RSE-Med laptop, followed later by the CDR who also undertook the experiment for the first time. The crewmembers took photographs of each other working the hardware, then closed down the payload and stowed it. *[Dykhanie-1 uses two body belts (PG-T/thoracic, PG-A/abdominal), a calibrator, resistor, mouthpiece, etc., to study fundamental physiological mechanisms of the external breathing function of crewmembers under long-duration orbital flight conditions. During the experiment, physiological measurements are taken and*

recorded with a pneumotachogram, a thoracic pneumogram, an abdominal pneumogram, and pressure data in the oral cavity. All experimentally derived plus salient environmental data along with personal data of the subject are recorded on PCMIA card for return to the ground at end of the Expedition. Objectives include determining the dynamics of the relationship between thoracic (pectoral) and abdominal breathing function reserves and their realization potential during spontaneous breathing, the coordinated spontaneous respiratory movements in terms of thoracic and abdominal components of volumetric, time & rate parameters of spontaneous respiratory cycle, identification of the features of humoral-reflex regulation of breathing by dynamics of ventilation sensitivity of thoracic and abdominal components to chemoreceptor stimuli, etc. Overall, the experiment is intended to provide a better understanding of the basic mechanisms of pulmonary respiration/gas exchange gravitational relations of cosmonauts.]

FE-2 Reisman performed maintenance on the OCA Router laptop, replacing its HDD (hard disk drive) with a spare HDD, reloaded it and configured it successfully for operations.

Volkov completed the periodic maintenance of the Russian telephone/telegraph subsystem (STTS) by switching it from its backup string to nominal mode on the primary string. *[The "Voskhod-M" STTS enables telephone communications between the SM (Service Module), FGB, DC1 Docking Compartment and U.S. segment (USOS), and also with users on the ground over VHF channels selected by an operator at an SM comm panel, via STTS antennas on the SM's outside. There are six comm panels in the SM with pushbuttons for accessing any of three audio channels, plus an intercom channel. Other modes of the STTS include telegraphy (teletype), EVA voice, emergency alarms, Packet/Email, and TORU docking support.]*

As part of regular preventive maintenance of RS (Russian Segment) ventilation systems, Oleg replaced the four dust filters (PF1-4) in the SM and cleaned the fan grilles of the LIV Video Complex hardware and its voltage converter, while Volkov later used vacuum cleaner and soft brush to clean the detachable VT7 fan screens 1, 2 & 3 of the three SOTR (Thermal Control System) gas-liquid heat exchangers (GZhT4) In the FGB (Funktsionalnyi-Grusovoi Blok).

After starting the POC DOUG (Portable Onboard Computers/Dynamic Onboard Ubiquitous Graphics) application, Garrett Reisman took the SSRMS (Space Station Remote Manipulator System) through its planned maneuver sequence. *[The sequence involved first grappling the SPDM (Special Purpose Dexterous Manipulator) "Dextre" to allow ground controllers to derigidize the SPDM LEE (Latching End Effector) to relax the tension in its snare cables. Afterwards, Dextre was released and the SSRMS was reconfigured for the first planned operations*

during Flight 1J, including moving its wrist joint in a position to protect the SSRMS LEE video camera against contamination from thruster plumes during the upcoming Progress 29P docking.]

CDR Volkov continued the current FGB outfitting with new stowage enclosures delivered by the ATV (Automated Transfer Vehicle), built in Russia to provide more efficient stowage spaces behind FGB panels and improve airflow/circulation. *[Today's outfitting involved one more container transferred in pieces from ATV stowage and its installation in the FGB zone (panel 312).]*

For the annual sensor verification and cleaning of the European MSG (Microgravity Science Glovebox) rack, FE-2 Reisman first activated the A31p MLC (MSG Laptop Computer), then worked his way through the individual certification steps. The checkout went well. *[Steps included MSG activation and warm-up, checkout of the MSG's temperature sensors without & with MTL (Moderate Temperature Loop) cooling, checkout of the two delta-pressure sensors by on/off switching of the three AHU (Air Handling Unit) fans which provide negative pressure inside the WV (Work Volume) to prevent escape in case of a leak, system inspections, WV cleaning, returning MSG back to delta-P Sensor 1 mode, switching it to Standby, and finally deactivating and reconfiguring the A31p.]*

In preparation of upcoming LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System) experiments, the FE-2 transferred data from the LOCAD reader #002 to storage and installed updated software with new calibration curves (for processing new Glucan LAL cartridges) on both readers (#002 & 003). *[LOCAD uses small, thumb-sized "microfluidic" cartridges that are read by the experiment reader. The cartridges contain dried extract of horseshoe crab blood cells and colorless dye. In the presence of the bacteria, the dried extract reacts strongly to turn the dye a green color. Therefore, the more green dye, the more microorganisms there are in the original sample. The handheld device tests this new analysis technology by sampling for the presence of gram negative bacteria in the sample in about 15 minutes. Lab-on-a-Chip technology has an ever-expanding range of applications in the biotech industry. Chips are available (or in development) which can also detect yeast, mold, and gram positive bacteria, identify environmental contaminants, and perform quick health diagnostics in medical clinics. The technology has been used to swab the MERs (Mars Exploration Rovers) for planetary protection. With expanded testing on ISS, this compact technology has broad potential applications in space exploration--from monitoring environmental conditions to monitoring crew health on long-duration flights.]*

Kononenko conducted the daily routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU

toilet facilities systems/replaceables.

As part of the ECLSS servicing, Oleg also performed the periodic check of the function of the IP-1 airflow sensors in the various Russian segment (RS) hatchways. *[The inspection includes the passageways PrK (SM Transfer Compartment)–ATV, PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1.]*

Working off the Russian "time permitting" task list, Volkov completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Also on the discretionary task list for the two cosmonauts remains the software upgrade of the "Sigma" BNO (Ballistic & Navigation Support Program) application on two Russian laptops, RSK1 & RSK2 (in DOS), patching it with a newly uplinked update to get the application running again (which computes real-time position of the ISS over the ground).

Garrett conducted the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week. The current cue card (17-0002C) lists 38 CWCs (~1515.1 L total) for the four types of water identified on board: technical water (772.7 L, for Elektron, flushing, hygiene), potable water (647.2 L), condensate water (89.4 L), waste/EMU dump and other (5.8 L). Of the 38 containers, 15 CWCs with technical water (620.5 L) and 4 CWCs with potable water (176.3 L) must be cleared for* Wautersia *bacteria by MCC-H before they can be used.]*

Additionally, Reisman completed the periodic checkup on active U.S. payloads, i.e., cleaning the ANITA (Analyzing Interferometer for Ambient Air) inlet plus inspecting and filter cleaning of the CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) incubator payload. *[The CGBA incubator is controlled from the ground, with automatic video downlinked to Earth. ANITA is now back up again and running in support of the on-going Freon-218 scrubbing from the cabin air, collecting data every six seconds and downlinking the data daily to the ground team. ANITA monitors low levels of potential gaseous contaminants in the ISS cabin atmosphere with a capability of simultaneously monitoring 32 gaseous contaminants. The experiment is testing the accuracy and reliability of this technology as a potential next-generation atmosphere trace-gas monitoring system for ISS and future spacecraft. This is a cooperative investigation with ESA.]*

Garrett conducted the periodic (every two weeks) inspection of the RED (Resistive

Exercise Device) canister bolts for re-tightening if required.

The crew is conducting their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-1, FE-2), TVIS treadmill (CDR), RED resistive exerciser (FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR). *[The RED, as an anaerobic muscle exerciser, allows a variety of routines: squat, heel raises, bent-over rowing, abdominal crunches, deadlift, bench presses, upright rowing, etc. For Sergey & Oleg, who are using RED three times a week, each session features four different routines which vary from day to day to target different muscle groups.]*

Afterwards, Garrett will download the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~10:50am EDT, Garrett Reisman participated in a live interactive PAO TV interview with Stephen Colbert of Comedy Central's "The Colbert Report". *[Stephen Colbert is the host and executive producer of the Emmy-nominated series "The Colbert Report" on Comedy Central. The "Colbert Report" has garnered huge ratings and critical success as one of the top shows on television. This interview was live-to-tape* ***to be aired on Comedy Central tonight at 11:30pm EDT****.]*

At ~10:55am EDT, Sergey & Oleg linked up with TsUP-Moscow stowage specialists via S-band to conduct the weekly IMS tagup, discussing stowage issues and equipment locations. *[Topics of discussion today included type and ID number of a found computer cable, identification of two bags reported as stowed in FGB enclosures, current location of discarded mufflers, etc.]*

At ~4:30pm, the crew is scheduled to downlink congratulatory PAO TV messages of greetings to three major Russian events: (1) the Seventh Delphian Youth Games of Russia "Our Future is in the Family"; (2) a conference dedicated to the 90th Anniversary of the Russian Children's Extra-Curricular Education System; and (3) a Gala Assembly in Moscow's Kremlin Palace dedicated to the 90th Anniversary of Russia's Border Security Forces. *[(1) The 7th Delphian Games, 5/16-21 in Novosibirsk, are dedicated this year to the Year of the Family, celebrated in Russia in 2008 per Presidential decree. After reading their message, the crew will unstow the Delphian Games flag, sign & date it, stamp it with the ISS insignia and stow it for return on Soyuz. (2) The 90th anniversary of Pre-School Extra-Curricular Education in Russia will be celebrated on 5/13 in the city of Ulyanovsk. (3) The gala for the Border Troops will be held on 5/28 at the Kremlin: "…We, the ISS crew, have a chance of a lifetime to observe the planet from space. And from here, from Earth orbit, we can appreciate a really huge expanse of Russia, which extends for*

thousands of kilometers from the Baltic Sea to the Pacific Ocean. The ISS is where one truly realizes the actual length of Russian border and how difficult it is to protect it. We know that you doing your job like true professionals, that we can trust you…"]

At ~6:20pm, FE-2 Reisman will have a private CDE (Crew Discretionary Event) phone conference via S-band.

Condensate Processing Issue: The Russian attempt to put the two air conditioner condensate evacuation pumps NOK-1 & NOK-2 into service for processing US condensate through the SM's SRVK (Condensate Processing Unit) failed on 5/6, and specialists at RSC-Energia are suspecting that the separator portion of the BRPK (Condensate Separation & Pumping Unit) may be failing due to end of life. Troubleshooting to restore functionality of the condensate processing system continues.

Condensate Water Management: With US condensate being produced but not processed for Elektron as required, Houston flight controllers have proposed a water dump on 5/18 or 5/19 to get rid of the surplus. The overboard venting would necessitate a temporary change in ISS attitude. Moscow agrees in principle to the attitude maneuver but is suggesting, as an alternate plan, to store the condensate in clean ATV tanks until the SRVK functionality has been restored. The proposal is under joint study.

COL FSL Update: The crew was thanked by COL-CC (Columbus Orbital Laboratory Control Center) for the repair of the FSL (Fluid Science Laboratory), which was successfully activated and performed nominally before being turned off again. Thanks were also extended for Garrett Reisman's support of the activation of the ERNObox, a special computer package with a new type of microchips, to be tested in the space environment, which also provides limited acceleration and temperature measurements. Data are on the ground and under investigation.

FGB KURS Testing Update: Two sets of KURS-P electronics on the FGB were tested on 5/6 for the AR&D (Automated Rendezvous & Docking) of Progress 29P on 5/16. Results were nominal, and the FGB is ready for the docking.

CDRA Activity Update: The US Carbon Dioxide Removal System has been active since yesterday to assist in the scrubbing of the cabin atmosphere after the 4/29 Freon-218 (Khladon) spill from the SKV-2 air conditioner. CDRA operation is planned for 5 days at 100,000 RPM (which will also help in the on-going CDRA dP trending). After the conclusion of CDRA ops, data of the active ESA ANITA instrument are expected to provide verification of the Freon levels in the cabin.

CBM Checkout: A checkout of the Node-2 CBM (Common Berthing Mechanism) in preparation for the JEM (Japanese Experiment Module)

“Kibo” on 1J was successfully completed yesterday.

CEO (Crew Earth Observations) photo targets uplinked for today were **East Haruj Megafans, Africa** *(weather was predicted be clear over this inland delta, caused by migration of stream channels over a depositional surface over 8000 years ago when the region had a wetter climate. These inland deltas ["megafans"] may represent an analog for features of similar appearance on Mars. Overlapping mapping frames, taken along track, were requested to capture the intricate network of ancient stream channels, visible as sinuous features on the land surface),* **S. Mozambique, Africa** *(some popcorn cumulus may have been present over this target area. The site includes is a basin targeted for petroleum extraction - this will cause significant changes to the existing ecosystems and surface processes in the area. Overlapping nadir frames, taken along track, were requested to capture the current state of land cover and land use in the target area),* and **Pilcomayo River dynamics, N Argentina** *(the Pilcomayo River rises in the Andes foothills, and then flows over 2,000 km southeast across central South America. Looking to the right of track for the river; context views along the river course were requested to record current channel configuration and adjacent vegetation and land use patterns)*.

CEO photography can be studied at this “Gateway” website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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Mean altitude loss in the last 24 hours -- 95 m
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??/??/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/05/08 -- ATV1 undocking
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1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	HQ-DL-ISS-Daily; iss-daily-external@lists.hq.nasa.gov;
CC:	
Subject:	ISS On-Orbit Status 05/07/08
Date:	Wednesday, May 07, 2008 1:07:02 PM
Attachments:	

ISS On-Orbit Status 05/07/08

All ISS systems continue to function nominally, except those noted previously or below.

FE-1 Kononenko completed the periodic servicing of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The regen process will be terminated before sleeptime, at ~4:55pm EDT. Regeneration of bed #2 follows tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. In order to assist in atmosphere scrubbing after the Freon-218 (Khladon) spill from the SKV-2 air conditioner on 4/24, the BMP's regeneration cycle was moded to 5 days instead of the regular 20 days.]*

CDR Volkov continued the current outfitting of the FGB with new stowage enclosures delivered by the ATV1 (Automated Transfer Vehicle 1), built in Russia to provide more efficient stowage spaces behind FGB panels and improve airflow/ circulation. *[Today's outfitting involved two more containers transferred in pieces from ATV stowage and their installation in the FGB zones 26 (panel 416) & 23B (panel 414), with bonding straps used for 23B.]*

Later, the FE-1 continued the periodic rearrangement of stowed equipment in the ATV "Jules Verne" to adjust the location of the vehicle's CG (center-of-gravity) for stable flight control, should its separation become necessary in a contingency. The stowage configuration was to be photographed for ground evaluation. *[ATV-1 undocking has now been moved from 8/10 to about 9/5 to allow use of more onboard propellants.]*

FE-2 Reisman used the electronic Velocicalc instrument to take THC IMV (Temperature & Humidity Control/Intermodule Ventilation) air flow measurements of relative humidity (dew point, wet bulb temp), temperature and velocity (flow rate) of

the air from the RS (Russian Segment) BMP inlet to the Lab and on to Node-2.

Afterwards, Reisman performed the periodic AAA (Avionics Air Assembly) fan & filter cleaning on the CHeCS (Crew Health Care Systems) rack at LAB1D4 which required powering down & rotating the rack forward and later reversing these steps, using the Velocicalc to check airflow values.

Using the RSE1 laptop, the FE-1 continued the extensive test program with the new Russian KPT-2 BAR-RM payload equipment begun on 5/5. *[Today's measurements were taken at various locations in the SM & FGB with the AU-1, Kelvin-Video, Iva-6A and TTM-2 instruments to update the list of possible background sources and interferences exceeding expected levels of potential leak signals. The BAR-RM data are being used for experimenting with ISS leak detection based on environmental data anomalies (temperature, humidity, and ultrasound emissions) at possible leak locations, in order to develop a procedure for detecting air leakage from ISS modules. The payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/ thermometer (TTM-2), an ultrasound analyzer (AU-1), and a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station.]*

Continuing his troubleshooting on the FSL (Fluid Science Laboratory) in the Columbus module, Garrett Reisman performed a checkout on the "ERNObox" structure for the FSL A31p laptop, checking switch status, proper mating of cables & connectors as well as the correct functioning of status LEDs (Light Emitting Diodes).

The FE-2 checked out the SSC-7 A31p laptop #1061 by installing a hard drive from an SSC (Station Support Computer) known to work OK.

Afterwards, Garrett had 30 min for reviewing new DOUG (Dynamic Onboard Ubiquitous Graphics) software uplinked for tomorrow's scheduled SSRMS (Space Station Remote Manipulator System) operations. *[DOUG is a special application running on the MSS (Mobile Service System) RWS laptops that provides a graphical birdseye-view image of the external station configuration and the SSRMS arm, showing its real-time location and configuration on a laptop during its operation.]*

Also in preparation for the Robotics activities, Garrett set up the SSRMS videocamera connection by hooking up the UOP DCP (Utility Outlet Panel/Display & Control Panel) power bypass cable at the CUP RWS (Cupola Robotic Work Station).

The FE-2 had another 85 min reserved for more hardware gathering and prepacking for return on the Shuttle at the conclusion of the upcoming STS-124-1J/ Discovery mission.

Sergey Volkov completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, plus replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV at the SKV-2 air conditioner for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Later today, Oleg is scheduled for the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Shortly before sleep time tonight, the CDR will conduct a functionality check of the RS STTS onboard radio communications system on the VHF-2 channel over Russian ground stations.

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (CDR, FE-1, FE-2), RED resistive exerciser (CDR, FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

Afterwards, Garrett was to download the crew’s exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Working off the Russian “time permitting” discretionary task list, Oleg performed another special session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program, using the NIKON D2X to take telephotos of the fresh eruption of the volcano Chaiten on the southern coast of Chile. *[More than 4000 people have been evacuated as a result of the volcano’s eruption. Only 300 people remain in the town of Chaiten located ~10km away from the volcano. Ash has covered an area within 10,000 km radius of the outbreak.]*

Also from the task list, Sergey worked on the “Sigma” BNO (Ballistic & Navigation Support Program) software on two Russian laptops, RSK1 & RSK2 (in DOS), patching it with a newly uplinked update to get the application running again (which computes real-time position of the ISS over the ground).

At ~4:40pm, Garrett Reisman is scheduled for his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop),

Condensate Processing Update: With the SKV-2 air conditioner currently off due to lack of sufficient Freon-218 (to be resupplied by Progress 29P) and SKV-1 out of service for a long time, the air conditioner's condensate evacuation pumps (NOK) were put into service to support the necessary condensate processing. The setup was tested yesterday, and preliminary indications were that the NOKs operated nominally. The pumps were powered off during crew sleep and were reactivated this morning.

CEO (Crew Earth Observations) photo targets uplinked for today were **Lake Nasser, Toshka Lakes, Egypt** *(weather was clear over these man-made lakes, created by overflow from Lake Nasser. Looking to the right of track for opportunities to map the shorelines of the lakes. Collection of frequent repeat imagery of the lakes is useful for tracking fluctuations in water level),* **Shortgrass Steppe, Colorado** *(ISS had a nadir pass over this long term ecological research [LTER] site located to the NE of the Rocky Mountains. The major research focus at this site is the effect of grazing on the existing ecosystems; of particular interest is the extent and character of vegetation cover in the area. Overlapping, nadir-viewing frames, taken along track, are being requested),* and **Volcano Colima, Mexico** *(weather was predicted to be clear over this active volcano - actually comprised of two eruptive centers, Nevado de Colima and Volcano de Colima. In additional to frequent eruptions from the summit vents, slope failures and debris avalanches are also a hazard associated with both cones. ISS had a nadir pass over this volcanic complex; imagery of the cones and surrounding deposits was requested)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 9:03am EDT [= epoch]):*
Mean altitude -- 341.4 km
Apogee height -- 345.8 km
Perigee height -- 336.9 km
Period -- 91.36 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006638
Solar Beta Angle -- 8.0 deg (magnitude decreasing)

Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 98 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54211

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (FGB nadir)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
??/??/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/05/08 -- ATV1 undocking
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-65/30P launch
09/12/08 -- Progress M-65/30P docking
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-66/31P launch
11/28/08 -- Progress M-66/31P docking
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	HQ-DL-ISS-Daily; iss-daily-external@lists.hq.nasa.gov;
CC:	
Subject:	ISS On-Orbit Status 05/06/08
Date:	Tuesday, May 06, 2008 12:15:25 PM
Attachments:	

ISS On-Orbit Status 05/06/08

All ISS systems continue to function nominally, except those noted previously or below.

Using the RSE1 laptop, CDR Volkov & FE-1 Kononenko spent three more hours on their test program with the new KPT-2 BAR-RM payload equipment begun yesterday. *[Today's measurements were taken with the AU-1, Kelvin-Video, Iva-6A & TTM-2 instruments near welds along SM (Service Module) structural rings and near the shell ring in the FGB for subsequent downlinking via BSR-TM channel. At the FGB pressurized shell ring, the two cosmonauts also inspected structural elements, equipment, and cable bundles for moisture, mold, or evidence of corrosion. The BAR-RM data are being used for experimenting with ISS leak detection based on environmental data anomalies (temperature, humidity, and ultrasound emissions) at possible leak locations, in order to develop a procedure for detecting air leakage from ISS modules. The payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/ thermometer (TTM-2), an ultrasound analyzer (AU-1), and a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station. Measurements are taken in specific zones in SM PkhO, FGB and DC1, both with lights, fans & ASU pump turned on and off.]*

FE-2 Reisman worked in the JLP (JEM Logistics Module Pressurized Section), setting up two A31p laptops and configuring them as SSCs (Station Support Computers) for use in the JEM (Japanese Experiment Module) "Kibo" arriving with STS-124/Discovery on 6/2.

Later, the FE-2 continued his EVA tool & equipment preparations in the US Airlock (A/L) for the 1J spacewalks. Ground commands afterwards deactivated the A/L CCAA (Common Cabin Air Assembly) air conditioner. *[So far, Garrett had completed 4.5 hrs out of the 10 hrs estimated for the 1J EVA tool config. If today's*

planned 3 hrs do not suffice for the remainder, an additional 2.5 hrs can be made available later. The final NBL (Neutral Buoyancy Laboratory) EVA simulation run at JSC/Sonny Carter Training Facility is scheduled for 5/16.]

FE-1 Kononenko continued outfitting in the FGB with new stowage enclosures delivered by the ATV1 (Automated Transfer Vehicle 1), built in Russia to provide more efficient stowage spaces behind FGB panels and improve airflow/circulation. *[Today's outfitting involved the two containers transferred yesterday in pieces from ATV stowage for installation in the FGB zones 30A & 30B (panel 421).]*

In the SM, CDR Volkov continued equipping crew cabin air ducts with new mufflers, replacing US-made noise suppressors (blue) with Russian acoustic mufflers (white) and taking documentary photographs for subsequent ground inspection. The blue mufflers were prepared for disposal. *[The muffler replacements were started last January by Peggy Whitson and Dan Tani on various fans in the SM.]*

Volkov completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV at the SKV-2 air conditioner for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Sergey also performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exerciser (FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

Afterwards, Garrett downloaded the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

The three crewmembers had their standard periodic PMCs (Private Medical Conferences) via S- & Ku-band audio/video.

Completing a voluntary item from the US "job jar" task list, Reisman recharged the

battery of the PWS (Portable Workstation) in the COL (Columbus Orbital Laboratory) and rebooted the laptop.

VolSci Program: For the Voluntary Science program on the weekend ahead (5/9-5/11), Garrett Reisman was offered two choices for his selection: (1) an "operations improvement" session with SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellites) with all three satellites (single-satellite experiments to test new thrusting algorithms and demonstrate safe trajectories for the inspection of space structures; two-satellite experiments to introduce new controllers and on-line path planning tools for purpose of docking to a complex tumbling satellite; three-satellite runs for formation flight experiments to test initialization of a formation and obstacle avoidance; (2) an EPO (Education Payload Operations) Demo on Space Careers, creating an educational video discussing different careers found at NASA, to be used to produce an educational product to enhance existing education resources for students in grades 9-12. Garrett's choice is required by tonight.

CEO (Crew Earth Observations) photo targets uplinked for today were **Ouarkziz Impact Crater, Algeria** *(this 3.5 km diameter impact structure in located within folded rocks of the Ouarkziz Monocline in Algeria. ISS had a near-nadir pass over the impact structure; overlapping frames, taken along track as ISS crossed the coastline and passed over the mountains were recommended. This mapping approach should have captured the crater),* **S. Mozambique, Africa** *(weather was predicted to be mostly clear over this ecological monitoring target. Development of petroleum resources over the next several years is expected to significantly alter the existing land cover and land use of the area. Overlapping nadir mapping frames, taken along track as ISS approached the coastline were requested),* **Harvard Forest, Vermont** *(this long term ecological research [LTER] site is focused on study of natural and human disturbances to forest ecosystems. Overlapping nadir frames, taken along track, were requested to obtain imagery of the forest canopy, open space, and urbanization),* and **High Central Andean Glaciers, S. America** *(the crew had an opportunity to capture context imagery of the eastern front of the Andes Mountains. Looking to the right of track for the mountains and glaciers; orbit track was parallel to the eastern mountain front)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:39am EDT [= epoch]):*
Mean altitude -- 341.5 km
Apogee height -- 346.1 km
Perigee height -- 336.8 km

Period -- 91.36 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0006885
Solar Beta Angle -- 3.3 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 106 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54195

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (FGB nadir)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/10/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
????/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
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11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)

2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	HQ-DL-ISS-Daily; iss-daily-external@lists.hq.nasa.gov;
CC:	
Subject:	ISS On-Orbit Status 05/05/08
Date:	Monday, May 05, 2008 12:13:15 PM
Attachments:	

ISS On-Orbit Status 05/05/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 3 of Increment 17. >>>Today 47 years ago (1961), the first U.S. Astronaut, Navy Commander Alan B. Shepard Jr., was launched on Mercury/Redstone "Freedom 7" on a suborbital flight of 15 minutes duration, reaching an altitude of 116 miles. This restored faith in the U.S. space program only 23 days after the Soviet space program launched Cosmonaut Yuri Gagarin into orbit around the planet. "Big Al" passed away on 21 July 1998.<<<*

FE-2 Reisman supported the Japanese CW/RW (Cell Wall/Resist Wall) experiment in the MSG EMCS (Microgravity Science Glovebox/European Modular Cultivation System), removing and relocating EC1 (Experiment Container 1) and EC2 on Rotor A and Rotor B. *[CW/RW operates in the EMCS facility in eight special ECs (Experiment Containers) which Garrett recently (3/30) installed on the centrifuges of the facility. The EMCS rack contains two rotating centrifuges, Rotor A & Rotor B, which can support a wide range of small plant & animal experiments under partial gravity conditions.]*

CDR Volkov, later assisted by FE-1 Kononenko, conducted the periodic inspection & audit of lighting fixtures in the RS (Russian Segment), testing each light by turning it on and checking fixtures that show one or both light bulbs inoperative with a working light unit from spares. *[There are close to two dozen lighting fixtures in the SM (Service Module), about a dozen lights in the FGB and 3 in the DC1 (plus two portable units). An audit of the available light spares will be conducted at a later date.]*

In the COL (Columbus Orbital Laboratory), the FE-2 continued his troubleshooting work on the FSL (Fluid Science Laboratory), today focusing on repairing the MIL Bus 1553 jumper connection after last week's LAN cable repair. *[Checkout of the FSL rack is scheduled later this week.]*

FE-1 completed another radiation data monitoring & logging session for flux & dose rate data with the Matryoshka-R radiation payload and its LULIN-5 electronics box. *[Accumulated readings were recorded on a log sheet for subsequent downlink to TsUP/Moscow via the BSR-TM payload data channel.]*

Kononenko also continued the transfer & installation in the FGB of the new stowage enclosures delivered by the ATV1 (Automated Transfer Vehicle 1), which were built in Russia to provide more efficient stowage spaces behind FGB panels and improve airflow/circulation. *[Oleg transferred the components for two containers, to be installed tomorrow in the FGB zones 30A & 30B (panel 421).]*

Reisman took more detailed measurements and photographs of the "divot" discovered earlier on the Node-1 hatch seal for ground analysis.

The FE-2 also inspected spare hatch seal segments currently stowed at the Airlock Port bulkhead to verify that they are in good condition in case they are needed for R&R.

Garrett had another 1.5 hrs set aside to prepare and configure tools and equipment in the US Airlock for the EVAs (Extravehicular Activities) during the upcoming STS-124/1J docked mission.

For the Russian EVA 20, Kononenko gathered tools required during the spacewalk which is currently scheduled for 7/10-11. *[Before stowing the tools at their location, Oleg inspected and checked out diverse ratchet wrenches, adapters, wing keys, wire & MLI (Multi-Layered Insulation) cutters and a hammer.]*

CDR Volkov continued outfitting SM crew cabin air ducts with new mufflers, replacing US-made noise suppressors (blue) with Russian acoustic mufflers (white) and taking documentary photographs for subsequent ground inspection. *[The muffler replacements were started last January by Peggy Whitson and Dan Tani on various fans in the SM.]*

The two Russian crewmembers worked with the Russian KPT-2 science payload BAR-RM, Kelvin, Ira and TTM, set up yesterday for battery charging, today running tests and taking the first measurements (temperatures, relative humidity, dew point temperatures), using the RSE1 laptop. *[The data, collected at locations such as feedthroughs, windows, hatches etc., are being used to get proficient in experimenting with ISS leak detection based on environmental data anomalies (temperature, humidity, and ultrasound emissions) at potential leak locations. After the data gathering, downlinking was via BSR-TM channel. The BAR-RM payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/thermometer (TTM-2), an ultrasound analyzer (AU-01), and*

a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station. Measurements are taken in specific zones (13 in SM PkhO and 4 in DC1), both with lights, fans & ASU pump turned on and off.]

In the JLP (Japanese Experiment Module Experiment Logistics Module Pressurized Section), Garrett Reisman performed the periodical status and shell temperature check from the MKAM (Minimum Keep-Alive Monitor).

Reisman also conducted the periodic calibration of the two CSA-O_2 (Compound Specific Analyzer-Oxygen sensor) instruments #1041 & #1052, using a calibration tank with accurately known pressure (2100 psi).

Kononenko completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV at the SKV-2 air conditioner for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Volkov performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exerciser (FE-1, FE-2) and VELO bike with bungee cord load trainer (CDR).

Afterwards, Garrett downloaded the crew’s exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Working off the Russian “time permitting” discretionary task list, Oleg performed a special session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program, using the NIKON D2X to take telephotos of the fresh eruption of the volcano Chaiten on the southern coast of Chile. *[More than 4000 people have been evacuated as a result of the volcano’s eruption. Only 300 people remain in the town of Chaiten located ~10km away from the volcano. Ash has covered an*

area within 10,000 km radius of the outbreak.]

At ~4:25am EDT, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU; [Glavnaya operativnaya gruppa upravleniya = "Main Operative Control Group"]), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~11:15am, Garrett Reisman conducted a 30-min "handover" teleconference with Gregory Chamitoff, his planned successor as FE-2. *[As usual for these FE/FE conferences, the purpose is to begin the handover process prior to the arrival on orbit through videocons and data exchanges between the current crew and the upcoming crew. These tagups should start toward the end of the first month on orbit.]*

ISS Orbit *(as of this morning, 8:17am EDT [= epoch]):*
Mean altitude -- 341.6 km
Apogee height -- 346.3 km
Perigee height -- 336.8 km
Period -- 91.37 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007026
Solar Beta Angle -- -1.4 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 106 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54179

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (FGB nadir)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/10/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
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09/09/08 -- Progress M-64/29P undocking (from DC1)
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10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch

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1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	HQ-DL-ISS-Daily; iss-daily-external@lists.hq.nasa.gov;
CC:	
Subject:	ISS On-Orbit Status 05/04/08
Date:	Sunday, May 04, 2008 10:43:54 AM
Attachments:	

ISS On-Orbit Status 05/04/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – crew off duty. Ahead: Week 3 of Increment 17.*

Flight Engineer Kononenko conducted the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables and the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV at the SKV-2 air conditioner for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

The U.S. CDRA (Carbon Dioxide Removal Assembly) was deactivated by the ground overnight (~9:00pm-2:00am EDT). With cooling no longer required, Flight Engineer Reisman demated and took down the ITCS LTL (Internal Thermal Control System/Low Temperature Loop) jumper at the CDRA-supporting LAB1D6 rack.

Reisman also completed the periodic offloading of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling CWC (Contingency Water Container) #1054 with 17 L water and putting an additional 5 L in #1062, all slated for Elektron processing. No samples required this time.

CDR Volkov conducted his first recharging of the Motorola Iridium-9505A satellite phone brought up on Soyuz 16S, a monthly routine job. *[After retrieving it from its location in the TMA-12/16S descent module (BO) at ~10:00am EDT, Sergey initiated the recharging of its lithium-ion battery, monitoring the process every 10-15 minutes as it took place. Upon completion at ~11:15am, the phone was returned inside its SSSP Iridium kit and stowed back in the BO's operational data files (ODF) container. The satphone accompanies returning ISS crews on Soyuz reentry &*

landing for contingency communications with SAR (Search-and-Rescue) personnel after touchdown (e.g., after an "undershoot" ballistic reentry, as happened during the recent 15S return). The Russian-developed procedure for the monthly recharging has been approved jointly by safety officials. During the procedure, the phone is left in its fire-protective fluoroplastic bag with open flap. The Iridium 9505A satphone uses the Iridium constellation of low-Earth orbit satellites to relay the landed Soyuz capsule's GPS (Global Positioning System) coordinates to helicopter-borne recovery crews. The older Iridium-9505 phones were first put onboard Soyuz in August 2003. The newer 9505A phone, currently in use, delivers 30 hours of standby time and three hours of talk, up from 20 and two hours, respectively, on the older units.]

Afterwards, the CDR set up the "Kelvin-Video" battery for charging for the upcoming operation of the Russian KPT-2 science payload BAR-RM. Using the Kelvin, Ira and TTM instruments, objective of the payload is to experiment with ISS leak detection based on environmental data anomalies (temperature, humidity, and ultrasound emissions) at leak locations. Data gathering will take place starting tomorrow using the RSE-1 laptop, with downlinking via BSR-TM channel. *[BAR-RM is designed to develop a procedure for detection of air leakage from ISS modules based on environmental data anomalies (temperature, humidity, ultrasound emissions). The payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/thermometer (TTM-2), an ultrasound analyzer (AU-01), and a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station. Measurements are taken in specific zones (13 in SM PkhO and 4 in DC1), both with lights & fans turned on and off.]*

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exerciser (FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

Working off the discretionary "time permitting" task list, Sergey Volkov completed another KPT-3 session to make observations and take aerial photography of environmental conditions for Russia's Environmental Safety Agency (ECON) using the Nikon D2X digital camera with SIGMA 300-800mm telephoto lens.

Also from the suggestions list, FE-2 Kononenko performed a session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program, using the NIKON D2X to take telephotos of glacier4s on the northern slope of the Caucasus Range, the Kolka glacier and oil spills on the Caspian Sea.

A third job on the discretionary task list was Oleg's first run of the Russian DZZ-2 "Diatomeya" ocean observations program, using the NIKON F-5 digital still camera with 80-200 mm lens and the SONY PD-150P camcorder from SM windows 7 & 8 to record highly productive water areas confined to dynamically active oceanic zones in the North Atlantic (US coastal areas and offshore areas of Brazil and Venezuela).

The two Russian crewmembers had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-9 laptop), Sergey at ~7:05am, Oleg at ~8:40am.

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:40am EDT [= epoch]):*
Mean altitude -- 341.7 km
Apogee height -- 346.4 km
Perigee height -- 337.0 km
Period -- 91.37 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.000697
Solar Beta Angle -- -5.9 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 98 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54163

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (FGB nadir)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/10/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
????/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch

09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	HQ-DL-ISS-Daily; iss-daily-external@lists.hq.nasa.gov;
CC:	
Subject:	ISS On-Orbit Status 05/03/08
Date:	Sunday, May 04, 2008 12:04:54 AM
Attachments:	

ISS On-Orbit Status 05/03/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – half-day off for CDR Volkov, FE-1 Kononenko & FE-2 Reisman.*

To provide cooling for the ground-commanded activation of the U.S. CDRA (Carbon Dioxide Removal Assembly), FE-2 Reisman begun his workday by connecting the regular ITCS LTL (Internal Thermal Control System/Low Temperature Loop) coolant jumper connection to the LAB1D6 rack. *[CDRA activation took place at 4:00am-5:15am EDT. The CDRA will operate over the weekend. Deactivation will occur when ppCO$_2$ drops to 2.5 mmHG. Deactivation will be Sunday evening or early Monday morning.]*

The crew conducted the regular weekly three-hour task of thorough house cleaning. *["Uborka", normally done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the Service Module (SM) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab. Additionally, as part of the weekly cleaning, Malenchenko performs an inspection of structural elements, cables and instruments behind SM panels for moisture.]*

As part of today's *uborka*, Volkov & Kononenko conducted preventive maintenance cleaning on the FS5, FS6, FS9, VPkhO, VdPrK, & VPrK fan grilles in the SM and the TsV2 fan inlet in the FGB (Funktsionalnyi-Grusovoi Blok, Functional Cargo Block).

At ~10:00am, the crew held their regular WPC (Weekly Planning Conference) with

the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP/Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

Sergey Volkov conducted the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exerciser (FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). *[The RED, as an anaerobic muscle exerciser, allows a variety of routines: squat, heel raises, bent-over rowing, abdominal crunches, deadlift, bench presses, upright rowing, etc. For Sergey & Oleg, who are using RED three times a week, each session features four different routines which vary from day to day to target different muscle groups.]*

Afterwards, Garrett transferred the crew's exercise data file to the MEC (Medical Equipment Computer) laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Working off the discretionary "time permitting" task list, Volkov completed another KPT-3 session to make observations and take aerial KPT-3 photography of environmental conditions for Russia's Environmental Safety Agency (ECON) using the Nikon D2X digital camera with SIGMA 300-800mm telephoto lens.

Also from the suggestions list, Kononenko performed a session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program, using the NIKON D2X to take telephotos of the hydrological situation on the Volga Aktyubinsk alluvial plain and oil spills on the Caspian Sea.

Weekly Science Update *(Expedition Seventeen -- Week 2)*

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Measurements continue in FGB module. Inc16 science data returned on 15S, waiting for hand-over to science team.

ANITA: Completed.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Germination in B3 and B4. A1 plants are still alive. Investigators are evaluating the possibility of EC A1/B1 position change.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): The final run of the CSLM-2 SPU was completed. The data files have been downlinked and the temperature data looks good. Everything appears to have worked as expected. Detailed analysis of the data will be forth coming as well as inspection of the samples once they return to the ground. “Thank you for supporting CSLM-2 research!!”

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): The crew was thanked for supporting the ELITE experiment. The data files were successfully downlinked and data analysis on the ground can now be started.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Completed. Inc16 science data returned on 15S, waiting for hand-over to science team.

EuTEF (European Technology Exposure Facility): On 4/25, EuTEF platform encountered an accidental de-activation of its power feeder #1. Ground operators re-activated all the instruments progressively, with the exception of FIPEX, which got delayed by a couple of days. - DEBIE-2: Link error still under investigation; - DOSTEL: On-going science acquisition; - EuTEMP: Currently inactive as planned; - EVC: Further troubleshooting is on-going; still problems to get high-rate data downlink; - EXPOSE: On-going science acquisition; - FIPEX: Long-duration measurements with sensors RAM1, RAM4 and ZENITH8 has been abruptly

interrupted on 4/25 after the accidental power feeder #1 de-activation. New science acquisition script has been started on 4/30; - MEDET: On-going science acquisition, running nominal; - PLEGPAY: Instrument is powered on, but not in science acquisition mode; - TRIBOLAB: On 4/25, the very sensitive TRIBOLAB Pin On Disk #2 (POD #2) run could be restarted, but science impact assessment is on-going.

FSL (Fluid Science Laboratory): FSL LAN (Local Area Network) was successfully performed on 4/30. Further troubleshooting activities are required after the erroneous telemetry with CEM-Upper) Optical Module. FSL MIL Bus cable has still to be repaired.

GEOFLOW: Start of GEOFLOW is pending further FSL commissioning activities (check of FSL optical modes) currently planned for next two weeks.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Complete.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION/REPOSITORY: In progress.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems):

Ongoing.

SAMPLE: Inc16 samples have been downloaded with 15S and handed over to science team.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): "Garrett, your Increment 17 remaining Sleep activities include: 2 download/initialization sessions, 1 more week of required Sleep logging, and doffing the Actiwatch on the Shuttle on your return home. Any additional sleep logging than the required week is above and beyond and greatly appreciated by the PI. Also, feel free to get a new Actiwatch band from the Actiwatch Supply Kit (#1042) and discard your old one. Just call down so we can track it."

SOLAR (Solar Monitoring Observatory): Initial Sun tracking was started on 4/29, but the Sun was not in the proper beta range to allow for nominal data acquisition – SOLAR platform went to Stand-By Mode when trying to track the Sun. On 4/30, solar measurements started with SOVIM and SOLSPEC instruments, but were affected by short Sun passes. - SOVIM: Acquiring science data – some glitches observed in the instrument telemetry; - SOLSPEC: Calibration activities (3 out of 4) successfully performed on 5/01. Acquiring science data; - SOLACES: Science acquisition to be restarted on 5/02, after some Command Sequence script was stopped on 5/01. Planned measurements will complement the ones gathered during the NASA Sounding Rocket campaign last April.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): The 4 ECs (Experiment Containers) of Rotor B are yet to be retrieved by the crew from the blocked Rotor B.

CEO (Crew Earth Observations): Through 4/30 the ground has received a total of 560 ISS/CEO images from Inc17 for review and cataloging. Currently under review are images with camera times corresponding to the following target list requests: Harvard Forest, Vermont (target acquisition unverified yet); Tigris-Euphrates Delta (preliminarily-appears somewhat overexposed); Tropical

Cyclone Nargis, Bay of Bengal (good effort); Afar Rift Zone, Ethiopia (preliminarily – very good with much of the area acquired); and Lake Pontchartrain, Mississippi Delta (excellent coverage of this dynamic event – will be published). "We are attempting to respond to your request for support in acquiring good views of the cities of Montreal, Cologne, Philadelphia, and Washington D.C. We have other targets in these areas as well, but have not been able to ask for them either because of poor weather. Now it appears we will have to wait a few weeks before illumination become adequate again for these locations. We will report back if we find any views of them in your imagery. Most of your imagery appears to be focused and well-composed, however please be advised that: a small number of your practice or personal interest images using the long lens settings and having no context views are extremely difficult to catalog and may never be located precisely. Thank you for your great response to our target requests to date!"

CEO (Crew Earth Observations) photo targets uplinked for today were **Tigris-Euphrates Delta, Middle East** *(ISS orbit track brought the station directly over the historically significant region that feeds into the Persian Gulf to the SE. Overlapping frames, taken along track, will provide a useful contextual view of the current configuration of the delta),* **Ile Rouleau Impact Crater, Quebec, Canada** *(weather was predicted to be clear over Ile Rouleau, a 4 km-diameter impact structure that is exposed at the surface as a small island. Looking to the right of track for the long, narrow northeast-southwest oriented Lake Mistassini - in appearance, the lake looks somewhat like claw marks on the landscape; overlapping frames along the extent of the lake will capture the crater near the southern end),* **Montreal, Quebec, Canada** *(Crew Request. Looking to the right of track for Montreal, weather was predicted to be clear),* **Santa Barbara Coast, California** *(ISS had a nadir pass over this long-term ecological research [LTER] site. Overlapping frames, taken along track as approaching the coast, were requested. Continuing to acquire overlapping frames as ISS crossed the urban area of Santa Barbara and crossed the coastline once again),* and **Madrean Sky Islands, Mexico** *(looking to the left of track as the station traversed the Gulf of California towards the Sierra Madre in Mexico. Contextual frames of the mountains, taken as ISS traveled parallel to them from NW to SE, will be useful for assessing the status of the forested "sky islands" on the upper slopes)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 4:34am EDT [= epoch]):*
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Apogee height -- 346.6 km
Perigee height -- 337.0 km
Period -- 91.37 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007109
Solar Beta Angle -- -10.4 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 97 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54145

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (FGB nadir)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/10/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
????/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola

1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	HQ-DL-ISS-Daily; iss-daily-external@lists.hq.nasa.gov;
CC:	
Subject:	ISS On-Orbit Status 05/02/08
Date:	Friday, May 02, 2008 12:09:08 PM
Attachments:	

ISS On-Orbit Status 05/02/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Sergey Volkov conducted the periodic auditing and restocking of the Russian SSVP (Docking & Internal Transfer System) accessory kits, located in the Soyuz BO (Orbital Compartment), FGB GA (Pressurized Adapter), FGB PGO (Instrumentation Cargo Compartment), Service Module PrK (SM Transfer Compartment), and DC1 (Docking Compartment). *[Support equipment in the SSVP kits includes handles, caps, screwdrivers, extenders, quick-disconnect clamps, wrenches, etc.]*

FE-1 Oleg Kononenko serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out" cycle to vacuum on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~5:15pm EDT. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. Filter bed 1 was regenerated yesterday. In order to assist in atmosphere scrubbing after last Tuesday's (4/29) Freon-218 spill from the SKV-2 air conditioner, the BMP's regeneration cycle was moded to 5 days instead of the regular 20 days.]*

Before continuing with the current CSLM-2 (Coarsening in Solid-Liquid Mixtures 2) payload activities, FE-2 Garrett Reisman installed a PCMCIA (Personal Computer Memory Card International Association) Ethernet memory card in the MSG (Microgravity Science Glovebox) laptop computer (MLC), attempting to solve a problem with downlinking medium-rate data from the MLC. *[Should the attempt be unsuccessful, Garrett was to copy the MSG & CSLM files over to the OCA for alternate downlink as done previously.]*

Afterwards, Reisman supported the CSLM-2 experiment by concluding the sample run of SPU-7 (Sample Processing Unit 7), transferring the data to the MLC and

stowing the hardware. *[This was the final run of CSLM-2. The equipment is planned to return to Earth with Reisman on STS-124/1J.]*

Kononenko performed maintenance and functionality checks on the Russian VELO cycle ergometer (VB-3), focusing on its pedals, crank arm and internal springs and photographing, disassembling and reassembling the exercise device. *[Done last: 2/17/08.]*

In the FGB, the two Russian crewmembers joined up for a two-hour audit and visual inspection of available stowage spaces in the areas behind Zarya's wall panels. *[The audit took down locations by stowage zone identifiers and available volume in terms of cubic meters or CTBE (Cargo Transfer Bag Equivalents), comparing with and updating existing estimates in the IMS (Inventory Management System).]*

In the Lab, FE-2 Reisman meanwhile conducted his own IMS-based partial audit of the CD (Compact Disk) Library (Vol. II), checking and verifying each CD in the Vol. II Library pockets. *[Discrepancies were to be reported to MCC-H for updating the IMS.]*

Sergey Volkov conducted the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Oleg Kononenko performed the daily IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

To support ground-commanded access to the ELITE-S2 experiment for data transfer, the FE-2 powered on the payload's IMU (Interface Management Unit). *[IMU can only be powered 5 hours per day to avoid violating an acoustic constraint. The Italian (ASI) experiment ELITE-S2 (Elaboratore Immagini Televisive - Space 2) is a human motion analysis facility for technological characterization and potential application for multifactorial movement analysis, to study the connection between brain, visualization and motion in micro-G. By recording and analyzing the three-dimensional motion of astronauts, this study should help engineers apply ergonomics into future spacecraft designs and determine the effects of weightlessness on breathing mechanisms for long-duration missions.]*

Later today, Volkov & Reisman are scheduled for their first standard 30-min Shuttle RPM (R-bar Pitch Maneuver) skill training, using the DCS-760 digital still camera with 400 & 800mm lenses at SM windows 6 & 8 (facing in flight direction) to take CEO (Crew Earth Observations) target imagery with manual focusing only. The practice run involves mapping of ground features with images having 40-59%

overlap and about 20 images in each sequence. Afterwards, the obtained OBT (onboard training) images are to be downlinked to the ground for analysis (~3:20pm). *[The RPM drill prepares crewmembers for the bottom-side mapping of the Orbiter at the arrival of the Shuttle (STS-124/1J) on 6/2 . During the RPM at ~600 ft from the station, the "shooters" have only ~90 seconds for taking high-resolution digital photographs of all tile areas and door seals on Discovery, to be downlinked for launch debris assessment. Thus, time available for the shooting will be very limited, requiring great coordination between the two headset-equipped photographers and the Shuttle pilot.]*

Garrett is scheduled to take measurements for the regular atmospheric status check for $ppCO_2$ (Carbon Dioxide partial pressure) in the Lab, SM (at panel 449) and COL (Columbus Orbital Laboratory), using the hand-held CDMK (CO_2 Monitoring Kit) #1002). *[The battery pack was to be replaced with the one from unit #1009 if necessary.]*

Conducting his first Increment 17 run of the Russian DZZ-2 "Diatomeya" ocean observations program, the CDR used the HDV (high-definition) video camera at SM window #7, with lights in the SM turned off, aiming for areas showing bioluminescent glow in darkness in the Pacific ocean.

Reisman filled out the regular FFQ (Food Frequency Questionnaire), his sixth, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA/ESA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

The FE-2 performed the regular bi-weekly reboot of the SSC (Station Support Computer) OCA Comm Router laptop.

Garrett also completed the periodic checkup on active U.S. payloads, i.e., cleaning the ANITA (Analyzing Interferometer for Ambient Air) inlet plus inspecting and filter cleaning of the CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) incubator payload. *[The CGBA incubator is controlled from the ground, with automatic video downlinked to Earth. ANITA continues to collect data every six seconds and downlinks the data daily to the ground team. ANITA monitors low levels of potential gaseous contaminants in the ISS cabin atmosphere with a*

capability of simultaneously monitoring 32 gaseous contaminants. The experiment is testing the accuracy and reliability of this technology as a potential next-generation atmosphere trace-gas monitoring system for ISS and future spacecraft. This is a cooperative investigation with ESA.]

Sergey & Oleg again spent a full hour each for themselves for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residency.

Reisman had another 2h 45min reserved for more hardware gathering and prepacking for return on STS-124/1J, going by an uplinked 1J Prepack List.

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exerciser (FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). *[The RED, as an anaerobic muscle exerciser, allows a variety of routines: squat, heel raises, bent-over rowing, abdominal crunches, deadlift, bench presses, upright rowing, etc. For Sergey & Oleg, who are using RED three times a week, each session features four different routines which vary from day to day to target different muscle groups.]*

Afterwards, Reisman transferred the crew's exercise data file to the MEC laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~3:45am EDT, Sergey & Oleg linked up with TsUP-Moscow stowage specialists via S-band to conduct the weekly IMS tagup, discussing stowage issues and equipment locations.

At ~9:40am, Garrett Reisman supported a 10-min. PAO TV interview with WABC-TV, New York (Lori Stokes/Ken Rosato).

At ~11:30am, Volkov & Kononenko downlinked PAO TV messages of greetings and congratulations from the US Node-2 to two celebratory events in Russia: (1) the annual Radio Day ceremony held 5/5 in the State Kremlin Palace of the Russian Federation in Moscow under the auspices of the Ministry of Information Technologies & Communications, and (2) the 60th Anniversary of the Main Rocket Assembly Shop #439 of RSC-Energia on 5/8. *[Radio Day, officially observed on 5/7, commemorates the first radio communication and demonstration session by Russian physicist Alexander Stepanovich Popov in 1895. Products built by the 60 year old Energia Rocket Assembly Facility and currently in use on the ISS include the "Pirs" DC-1, cargo booms and the narrow beam antenna.]*

Later tonight (~4:35pm), the ISS crew will link up with the Lead Flight Director at JSC/MCC-H via S-band/audio to conduct their first weekly tagup. *[S/G-2 (Space-to-Ground 2) phone patch via SSC-10 (Station Support Computer 10)]*.

EMCS Update: After Reisman's replacement of water reservoirs in the MSG EMCS (Microgravity Science Glovebox/European Modular Cultivation System) on 4/22, three ECs (Experiment Containers) on rotor B have been successfully hydrated and are now showing germination in two of them. Hopefully, the third one may also respond. *[The Japanese CW/RW (Cell Wall/Resist Wall) experiment operates in the EMCS facility in eight special ECs (Experiment Containers) which Garrett installed on 3/30 on the facility's centrifuges. The EMCS rack contains two rotating centrifuges, Rotor A & Rotor B, that can support a wide range of small plant & animal experiments under partial gravity conditions.]*

CWC Update: A new updated CWC (Contingency Water Container) "cue card" was uplinked for the crew's reference. *[The new card (17-0002B) lists 38 CWCs (~1489.8 L total) for the four types of water identified on board: technical water (772.7 L, for Elektron, flushing, hygiene), potable water (647.2 L), condensate water (64.1 L), waste/EMU dump and other (5.8 L). Of the 38 containers, 15 CWCs with technical water (620.5 L) and 4 CWCs with potable water (176.3 L) must be cleared for* Wautersia *bacteria by MCC-H before use.]*

CEO (Crew Earth Observations) photo targets uplinked for today were **Western Pamirs, central Asia** *(the mountains of the western Pamirs boast several impressive glaciers with banded moraines, and rock glaciers are present in some valleys. Snow cover should be starting to diminish, and the ground requested context views of the mountains and glaciers as ISS traversed the range from NW to SE),* **Karakoram, central Asia** *(as ISS left the Pamirs [preceding target], its orbit track brought it over the Karakoram Range. These mountains are also extensively glaciated, and requested were short-lens imagery taken along-track to assess the degree of snow cover),* and **Georgia Coastal Ecosystems, USA** *(weather was predicted to be clear over this long-term ecological research [LTER] site. Overlapping nadir frames, taken along track as the station approached the coast were requested. Images of coastal vegetation, beach morphology, and offshore sediment are of particular interest)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:43am EDT [= epoch]):*
Mean altitude -- 341.9 km

Apogee height -- 346.6 km
Perigee height -- 337.1 km
Period -- 91.37 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007032
Solar Beta Angle -- -14.6 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 97 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54132

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (FGB nadir)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/10/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
????/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola

1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	HQ-DL-ISS-Daily; iss-daily-external@lists.hq.nasa.gov;
CC:	
Subject:	ISS On-Orbit Status 05/01/08
Date:	Thursday, May 01, 2008 11:29:34 AM
Attachments:	

ISS On-Orbit Status 05/01/08

All ISS systems continue to function nominally, except those noted previously or below. *Russian holiday: Spring & Labor Day. Also: Labor Day in Europe.*

Upon wake-up, CDR Volkov terminated his first MBI-12 SONOKARD experiment session, started last night, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

FE-1 Kononenko began his workday with the routine checkup of DC1 (Docking Compartment) circuit breakers and fuses as part of his regular morning inspection tour. *[The monthly checkup in the "Pirs" DC1 looks at AZS circuit breakers on the BVP Amp Switch Panel (they should all be On) and the LEDs (light-emitting diodes) of 14 fuses in fuse panels BPP-30 & BPP-36.]*

Today was RS (Russian Segment) ventilation systems cleanup day. The regular periodic preventive maintenance on fan grilles and airducts was conducted by the FE-1 in the DC1 on the V1, V2 & V3 ventilators, VD1 & VD2 airducts and also included the filter replacement for the dust collectors PF1 & PF2, and by the CDR in the FGB on interior wall panel ventilation screens.

Volkov completed the periodic servicing of the active Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The regen

process will be terminated before sleeptime, at ~4:55pm EDT. Regeneration of bed #2 follows tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. In order to assist in atmosphere scrubbing after last Thursday's Freon-218 spill from the SKV-2 air conditioner, the BMP's regeneration cycle was moded to 5 days instead of the regular 20 days+. With about 1 g/m^3 concentration, the pollutant stayed an order of magnitude under the SMAC (Spacecraft Maximum Allowable Concentration) level. Since SKV-2 remains off until fresh Freon-218 can be delivered on Progress 29P (and SKV-1 nonfunctional), plans are to do condensate processing with the air conditioner's condensate evacuation pump (NOK-2) which, being an untested configuration, should go into operation next week.]*

In the Service Module (SM), Kononenko took the periodic readings of potentially harmful atmospheric contaminants with the CMS (Countermeasure System) part of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, which uses preprogrammed microchips to measure H_2CO (Formaldehyde, methanal), CO (Carbon Monoxide) and NH_3 (Ammonia), taking one measurement per microchip. *[CO not measured today. CMS is part of the Russian SKDS Pressure Control & Atmosphere Monitoring System.]*

FE-2 Garrett Reisman conducted his third session with the ELITE-S2 (Elaboratore Immagini Televisive - Space 2) payload, after detaching the CEVIS (Cycle Ergometer with Vibration Isolation) from the ER3 (EXPRESS Rack 3) and moving it out of the field of view of the cameras crucial to of the experiment, which he set up for capturing his movement protocol. This was followed by powering up the IMU (Interface Management Unit) and calibrating the work area for the cameras (half of the work area facing one way, the other half facing the other way). The FE-2 then had ~80 min to perform the test operations, followed by stowing the test camera, turning off the IMU and re-installing the CEVIS in the Lab. *[The Italian (ASI) experiment ELITE-S2 is a human motion analysis facility for technological characterization and potential application for multifactorial movement analysis, to study the connection between brain, visualization and motion in micro-G. By recording and analyzing the three-dimensional motion of astronauts, this study should help engineers apply ergonomics into future spacecraft designs and determine the effects of weightlessness on breathing mechanisms for long-duration missions. For each of three protocols (e.g., MOVE, IMAGINE), a set of body landmarks are identified and reflective markers are applied on the subject who then performs prescheduled movements with the index finger tips then returns to the initial position (for example, the subject has to reach and brush, without exerting forces). The video cameras trace the trajectories of the body parts of the astronaut catching the light reflected by the markers, thus recording the kinetic and trajectory data of the movement.]*

After yesterday's prepacking conference with MCC-Houston, Reisman today had about an hour reserved to start gathering and prepacking equipment for return on STS-124/1J, going by an uplinked 1J Prepack List.

While Garrett prepacked return hardware, the two Russian crewmembers had ~1hr set aside for a commemorative ("symbolic") activity for Espace Lollini, a French stamp collecting company, stamping 600 postage envelopes with a Russian ISS onboard seal and inscribing them with their signatures.

Sergey Volkov conducted the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Oleg Kononenko performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exerciser (FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). *[The RED, as an anaerobic muscle exerciser, allows a variety of routines: squat, heel raises, bent-over rowing, abdominal crunches, deadlift, bench presses, upright rowing, etc. For Sergey & Oleg, who are using RED three times a week, each session features four different routines which vary from day to day to target different muscle groups.]*

Afterwards, Reisman transferred the crew's exercise data file to the MEC (Medical Equipment Computer) laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Sergey & Oleg again had the regular full hour each for themselves for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residency.

CEO (Crew Earth Observations) photo targets uplinked for today were **Tropical Cyclone Nargis, Bay of Bengal** *(Dynamic event. Looking left for the center of this downgraded "Strong Category 2" storm which is heading slowly ENE),* **Lake Nasser, Toshka Lakes, Egypt** *(nadir pass, with Toshka lakes right and Lake Nasser nadir and left of track; crew was to shoot shorelines),* **Afar Rift Zone, Ethiopia** *(looking just left of track for the volcanoes and numerous parallel fault*

lines in black rocks. A mapping swath was requested), **Washington D.C. and Philadelphia** *(crew requests. Both cities appeared at the same time, with Philadelphia further off track. Looking left),* and **Lake Pontchartrain, Mississippi River delta** *(Dynamic event. The look geometry was almost exactly the same as in the last request for this target: looking left for water color changes in Lake Pontchartrain from the influx of Mississippi R. water [especially near the spillway where the river comes closest to the lake]).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:21am EDT [= epoch]):*
Mean altitude -- 342.0 km
Apogee height -- 346.8 km
Perigee height -- 337.1 km
Period -- 91.37 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007243
Solar Beta Angle -- -18.7 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 97 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54116

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (FGB nadir)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/10/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
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10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
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12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
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12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/30/08
Date:	Wednesday, April 30, 2008 2:02:30 PM
Attachments:	

ISS On-Orbit Status 04/30/08

All ISS systems continue to function nominally, except those noted previously or below.

Upon wake-up, FE-1 Kononenko terminated his first MBI-12 SONOKARD experiment session, started last night, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. At ~5:20pm EDT, just before sleep time, CDR Volkov will start his first overnight MBI-12 session. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

As part of regular preventive maintenance of RS (Russian Segment) ventilation systems, Volkov cleaned Group A, B & C fan screens in the SM (Service Module) and inspected close-by equipment & structural elements for residue and condensate, prepared to take photographs with the NIKON D2X for downlink if found.

Kononenko completed ventilation maintenance in the FGB (Functional Cargo Block), cleaning the mesh screens of its TsV1 ventilation fan.

In the COL (Columbus Orbital Laboratory), FE-2 Garrett Reisman continued troubleshooting the FSL (Fluid Science Laboratory), removing & replacing the facility's LAN (Local Area Network) P46 cable and MIL Bus 1553B-A jumper.

The FE-1 continued the transfer & installation in the FGB of the new stowage enclosures delivered by the ATV1 (Automated Transfer Vehicle 1), which were built

in Russia to provide more efficient stowage spaces behind FGB panels and improve airflow/circulation. *[Today's outfitting was in FGB Zone 23A (behind panel 412) and Zone 28B (panel 419).]*

Reisman had 3 hrs. reserved which he spent in the US Airlock (A/L) for pre-gathering, collecting and configuring all EVA tools available for STS-124/1J. The A/L CCAA (Common Cabin Air Assembly) air conditioner was activated by ground command at ~7:15am to support Garrett's stay in the A/L.

Kononenko serviced the Matryoshka-R (RBO-3-2) radiation payload, which has taken over the ESA/RSC-Energia experiment ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS) with its AST Spectrometer and ALC equipment on DC1 panel 429. *[Oleg removed PCMCIA card #946 from the AST slot and replaced it with a new memory card, #947, from the ALC kit.]*

Volkov completed the periodic (about twice a month) replenishing of the Elektron oxygen generator's water supply for electrolysis, filling the KOV EDV container with water collected in CWC (Contingency Water Container) #1076 from the Lab CCAA (Common Cabin Air Assembly) dehumidifier. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron shutdown.]*

Reisman set up the ELITE-S2 (Elaboratore Immagini Televisive - Space 2) payload in the ER2 (EXPRESS Rack 2) for his upcoming third session, connecting camera cables to the experiment's IMU (Interface Management Unit) and routing cables in the Lab for the ER2 configuration. *[The Italian (ASI) experiment ELITE-S2 is a human motion analysis facility for technological characterization and potential application for multifactorial movement analysis, to study the connection between brain, visualization and motion in micro-G. By recording and analyzing the three-dimensional motion of astronauts, this study should help engineers apply ergonomics into future spacecraft designs and determine the effects of weightlessness on breathing mechanisms for long-duration missions.]*

Afterwards, the FE-2 supported the CSLM-2 (Coarsening in Solid-Liquid Mixtures 2) experiment in the MSG (Microgravity Science Glovebox) facility, terminating the final vacuum draw started yesterday and initiating the first sample run, for SPU-7 (Sample Processing Unit 7). *[SPU-7 will process for 24 hrs overnight before Garrett resumes activities tomorrow. CSLM-2 examines the kinetics of competitive particle growth within a liquid matrix. During this process, small particles shrink by losing atoms to larger particles, causing the larger particles to grow (coarsen) within a liquid lead/tin matrix. This study defined the mechanisms and rates of coarsening that govern the manufacture with metals from turbine blades to dental amalgam fillings.]*

The CDR had another hour to continue his extensive periodic audit of SUBA (Onboard Equipment Control System) plug-in locations in the RS, started yesterday, supported by an uplinked 4-page checklist. *[The standard audit establishes what hardware is plugged in at which electrical RS outlets. SUBA controls, monitors, and diagnoses RS systems status. It operates using sensor output signals and command radio link SM functional outputs, onboard computer system (BVS) units, SM control panels, and system relay outputs. Its software resides in the SM central computer (TsVM) and terminal computer (TVM). The BSKs are used to switch electrical power and protect electrical circuits with fuses against overloads.]*

Sergey also conducted the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Oleg performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

FE-2 Reisman conducted the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week. The current cue card (17-0002A) lists 38 CWCs (~1595.6 L total) for the four types of water identified on board: technical water (853.8 L, for Elektron, flushing, hygiene), potable water (647.2 L), condensate water (88.8 L), waste/EMU dump and other (5.8 L). Of the 38 containers, 15 CWCs with technical water (672.6 L) and 4 CWCs with potable water (176.3 L) must be cleared for* Wautersia *bacteria by MCC-H before use.]*

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exerciser (FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). *[The RED, as an anaerobic muscle exerciser, allows a variety of routines: squat, heel raises, bent-over rowing, abdominal crunches, deadlift, bench presses, upright rowing, etc. For Sergey & Oleg, who are using RED three times a week, each session features four different routines which vary from day to day to target different muscle groups.]*

Afterwards, Reisman transferred the crew's exercise data file to the MEC (Medical Equipment Computer) laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Volkov & Kononenko again had the regular full hour for themselves for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residency.

At ~8:30am EDT, the crew participated in a teleconference with MCC-Houston to discuss STS-124/1J prepacking requirements, based on an uplinked 1J Prepack List. *[While at present only Garrett is scheduled for prepack activities, Sergey and Oleg will probably also be scheduled in the future.]*

At ~10:20am, Volkov, Kononenko & Reisman joined in two separate televised PAO interview events, with KTRH Radio (J.P. Pritchard/Lana Hughes), Houston, and WINS Radio (Alice Stockton-Rossini), New York.

SKV-2 R&R Update: Yesterday, during the IFM (Inflight Maintenance) on the Russian SKV-2 air conditioner to replace its compressor with a spare, a Freon-218 spill occurred, releasing about 600 g of the refrigerant into the cabin (~1gram/cubic meter). To clean up quickly, the Russian BMP (Russian Harmful Impurities Removal System) was moded to regenerate its absorbent beds every 5 days instead of the regular 20 days, and all users have verified that no equipment on board is operating with internal temperatures above 600 degC (which would degrade the chemical). The US TCCS (Trace Contaminant Control System) operates nominally. *[Freon-218 (Octafluoropropane/C_3F_8, Russian: Khladon) is safe (low toxicity, perhaps some irritation) and noncorrosive. Primary hazard is oxygen displacement, as witness the Ozone Layer, but there is not enough C_3F_8 on board the ISS to significantly deplete any atmospheric oxygen.]*

PPS P6 Reconditioning: At ~11:00am EDT, reconditioning (discharge/recharge) maintenance has started on the truss P6 battery sets 2B3 (channel 2B) and 4B3 (channel 4B), simultaneously. The approximate timeframe for the reconditioning is about 5-7 days from today. After today's start of discharge, the batteries will be transitioned to recharge, followed by a second discharge/recharge cycle and a subsequent capacity test. *[P6 battery sets 2B2 & 4B2 were reconditioned last January.]*

CEO (Crew Earth Observations) photo targets uplinked for today were **Tropical Cyclone Nargis, Bay of Bengal** *(Dynamic event. Looking right for this Category 4 storm which is starting to control the weather in the whole of the Bay of Bengal. Nargis is predicted to move towards Burma, but Bangladesh, situated at the head of the bay, fears Nargis may ruin this year's crops, as did Cyclone Sidr last November),* **Georgia Coastal Ecosystems** *(the study area is a barrier island and marsh complex located on the central Georgia coast in the vicinity of Sapelo Island,*

one of the largest and least developed rivers on the east coast of the United States), and **Jornada Basin, New Mexico** *(this Long Term Ecological Research [LTER] project focuses on changes in the distribution of soil resources (soil color as seen from low earth orbit) as an index of vegetation change in semiarid lands. Look near nadir just after you cross the Rio Grande. Other visual cues are White Sands and Las Cruces, NM).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:48am EDT [= epoch]):*
Mean altitude -- 342.1 km
Apogee height -- 347.0 km
Perigee height -- 337.1 km
Period -- 91.38 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007412
Solar Beta Angle -- -22.6 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 105 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54100

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (FGB nadir)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking

10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/29/08
Date:	Tuesday, April 29, 2008 12:35:28 PM
Attachments:	

ISS On-Orbit Status 04/29/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Volkov worked a major IFM (Inflight Maintenance) in replacing the compressor unit of the Russian SKV-2 air conditioner with a spare, after first verifying deactivation of SKV-2 and the associated NOK-2 condensate evacuation pump. The separation & reconnection of hydraulic lines required several leak checks during the IFM. The activities were supported by tagup with ground specialists via S-band and photo documented. *[The SKV-2 shut down yesterday morning due to high temperature, but the compressor R&R had already been scheduled for some time.]*

With the BITS2-12 onboard telemetry system's still disconnected at the SKV-2 and the Elektron ST-64 current stabilizer (BD-SU control mode remaining active), FE-1 Kononenko replaced the ST-64 with a spare unit to check out the latter's operability. Later, Sergey & Oleg reconnected the BITS2-12, and the Elektron was restarted in 32A mode by the ground, with Kononenko monitoring the external temperature of its secondary purification unit (BD) for the first 10 minutes of operations to ensure that there was no overheating. The activities were supported by tagup with ground specialists via S-band. *[When the FE-1 disconnected the BITS2-12 telemetry connector at the ST-64, an "SM Elektron Catastrophic Failure" alarm alerted the crew but was quickly identified by TsUP-Moscow as having been generated by erratic data caused by the cable disconnection. The message was unexpected since it had not annunciated previously in ground tests of the R&R.]*

FE-2 Reisman completed Part 2 of the extended troubleshooting of the COL (Columbus Orbital Laboratory) condensate water separator blockage started yesterday: After modification of the condensate recovery system "T" connector by Kononenko, Reisman removed the Node-2/COL waste water jumper to allow the temporary hookup of a one-liter sample bag, then inspected its accumulating

contents periodically during the day for evidence of the blockage. The troubleshooting ended with equipment teardown. *[Since first activation of the COL condensate system, ground specialists have suspected a partial blockage of the condensate line from COL through Node-2 into the Lab. Ground-commanded troubleshooting has had inconclusive results. The ISS crew was required to temporarily disconnect the condensate (waste water) jumper in the Node-2/COL vestibule in order to obtain flow rate data as a step towards possibly locating the site of the blockage.]*

The FE-1 continued the transfer & installation in the Functional Cargo Block (FGB) of the first set of stowage enclosures delivered by the ATV1 (Automated Transfer Vehicle1), which were built to provide more efficient stowage spaces behind FGB panels. *[Today's outfitting was in FGB Zone 41 (behind panel 218).]*

The CDR conducted the extensive periodic audit of SUBA (Onboard Equipment Control System) plug-in locations in the Russian segment (RS), supported by an uplinked 4-page checklist. *[The standard audit establishes what hardware is plugged in at which electrical RS outlets. SUBA controls, monitors, and diagnoses RS systems status. It operates using sensor output signals and command radio link SM functional outputs, onboard computer system (BVS) units, SM control panels, and system relay outputs. Its software resides in the SM central computer (TsVM) and terminal computer (TVM). The BSKs are used to switch electrical power and protect electrical circuits with fuses against overloads.]*

In the Lab, FE-2 supported the CSLM-2 (Coarsening in Solid-Liquid Mixtures 2) experiment in the MSG (Microgravity Science Glovebox) facility by continuing the vacuum venting (evacuation) sequence of the sample chamber in preparation for experiment operations scheduled tomorrow. *[Evacuation activities consisted in closing vacuum vent valves, checking for acceptable humidity levels, and opening the SPU (Sample Processing Unit) water valve to initiate unattended vacuum prep, followed later by closing the SPU water valve, checking again for humidity levels in the sample chamber, and opening the vent valve and vacuum valve to initiate a vacuum draw on the sample chamber. The steps were later repeated for another SPU. CSLM-2 examines the kinetics of competitive particle growth within a liquid matrix. During this process, small particles shrink by losing atoms to larger particles, causing the larger particles to grow (coarsen) within a liquid lead/tin matrix. This study defined the mechanisms and rates of coarsening that govern the manufacture with metals from turbine blades to dental amalgam fillings.]*

FE-2 Reisman updated the three deployed Warning books in their Payload and TCS (Thermal Control System) sections, in particular by replacing pages and making P&I (Pen & Ink) changes for possible NH_3 (ammonia) spills/leaks. The

books were then restowed at their Lab, SM & FGB locations.

Garrett also conducted the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Oleg completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The three crewmembers had their standard periodic PMC (Private Medical Conference) via S- & Ku-band audio/video.

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED (FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1). *[The RED, as an anaerobic muscle exerciser, allows a variety of routines: squat, heel raises, bent-over rowing, abdominal crunches, deadlift, bench presses, upright rowing, etc. For Sergey & Oleg, who are using RED three times a week, each day features four different routines which vary from day to day to target different muscle groups.]*

Afterwards, Garrett transferred the crew’s exercise data file to the MEC (Medical Equipment Computer) laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Volkov & Kononenko again had the regular full hour for themselves for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residency. *[Today also used as backup for completing the complex IFMs in case of time overrun.]*

At ~5:20pm, just before sleep time, Kononenko will set up the Russian MBI-12 SONOKARD (Sonocard) payload and start his first experiment session, using a sports shirt from the SONOKARD kit with a special device in the pocket for testing a new method for acquiring physiological data without using direct contact on the skin. Measurements are recorded on a data card for return to Earth. Volkov will start his first MBI-12 session tomorrow evening. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember’s physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless*

acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]

Soyuz TMA-12 Relocation Update: The Soyuz 16S relocation from DC1 to FGB, originally set for 5/7, has been deferred to a later date. Consequently, Progress 29P on 5/16 will have to dock to the FGB nadir port instead of the DC1. If its KURS antenna fails to retract nominally (as happened on 10/26/06 with Progress M-58/23P), Flight Rules currently would not allow the docking at this port. Also, if the Soyuz relocation does not take place before the next Russian EVA (7/10-11), Reisman, as IVA crewmember, will have to remain in the Soyuz vehicle, docked at the DC1, during the spacewalk.

Soyuz TMA-11 Anomaly Update: The Russian commission investigating the Soyuz 15S ballistic re-entry (4/19) has been elevated to a State Commission headed by Roskosmos, with RSC-Energia participating. The team has been directed to conclude the investigation by the end of May.

CEO (Crew Earth Observations) photo targets uplinked for today were **Tropical Cyclone Nargis, Bay of Bengal** *(Dynamic event. ISS track passed over the predicted center of this storm, which should have reached Category 3 strength. It is a relatively small, well-structured storm. The ground suggested oblique views looking directly forward, with short lenses, to capture the entire cloud mass in one image),* **Afar Rift Zone, Ethiopia** *(looking left from track for the volcanoes [black rock masses] and numerous straight fault lines in this famous rift zone [one of the few places on Earth where an oceanic spreading center can be seen above sea level]),* and **Lake Pontchartrain, Mississippi Delta** *(Dynamic event. Looking left for water color changes in Lake Pontchartrain which lies immediately north of New Orleans and the Mississippi River. The spillway between the present high water of the Mississippi River and Lake Pontchartrain has been opened to reduce pressure on New Orleans's dikes. Looking for turbid water in the lake)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:58am EDT [= epoch]):*
Mean altitude -- 342.3 km
Apogee height -- 347.1 km
Perigee height -- 337.2 km
Period -- 91.38 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007324

Solar Beta Angle -- -26.2 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 107 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54085

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (FGB nadir)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at

http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/28/08
Date:	Monday, April 28, 2008 1:26:30 PM
Attachments:	

ISS On-Orbit Status 04/28/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 2 of Increment 17.*

First thing in the morning, FE-2 Garrett Reisman worked in the JLP (Japanese Experiment Module Experiment Logistics Module Pressurized Section), performing the periodical status & shell temperature check from the MKAM (Minimum Keep-Alive Monitor) panel and calling down the temperatures via S-band.

Later Reisman continued his support of the CSLM-2 (Coarsening in Solid-Liquid Mixtures 2) experiment in the activated MSG (Microgravity Science Glovebox) facility, initiating another evacuation sequence in preparation for final experiment operations scheduled Wednesday (4/30). *[Evacuation activities consisted in closing vacuum vent valves, checking for acceptable humidity levels, and opening the SPU (Sample Processing Unit) water valve to initiate unattended vacuum prep, followed later by closing the SPU water valve, checking again for humidity levels in the sample chamber, and opening the vent valve and vacuum valve to initiate a vacuum draw on the sample chamber. The steps were later repeated for another SPU. CSLM-2 examines the kinetics of competitive particle growth within a liquid matrix. During this process, small particles shrink by losing atoms to larger particles, causing the larger particles to grow (coarsen) within a liquid lead/tin matrix. This study defined the mechanisms and rates of coarsening that govern the manufacture with metals from turbine blades to dental amalgam fillings.]*

CDR Sergey Volkov performed a 2-hr maintenance job on the Service Module's Internal Thermal Loop 2 (SM KOB2) to restore it to nominal service by replacing the failed 4SPN1 pump panel with a spare unit. *[On 3/18, RSC-Energia declared micro pump #1 (one of two) in the 4SPN1 replaceable pump panel of the SM TCS (SOTR, Thermal Control Systems)'s KOB-2 loop failed. A replacement unit was delivered on ATV1 "Jules Verne". Each of the two SOTR KOB loops has two redundant pump panels with two redundant pumps each. While in the early years of Mir and*

ISS the pumps were integral to the SPN panels, the current design allows them to be replaced without requiring an entire new SPN block.]

Volkov also spent some time searching for and gathering equipment/tools required for a planned replacement of the Russian SKV-2 air conditioner's compressor assembly, scheduled tomorrow. *[SKV-2 was shut down last week due to high temperature. SKV-1 has been off for a long time.]*

FE-1 Oleg Kononenko unloaded three stowage enclosures/containers from the ATV, transferred them to the FGB and installed them later in its Pressurized Adapter (GA) compartment.

Garrett Reisman prepared Node-2 for the arrival of the JEM (Japanese Experiment Module) on STS-124 by unlatching the hatch of its portside docking port.

In the US Airlock, Reisman replaced both FDS QDMAs (Fire Detection & Suppression/Quick-Don Mask Assemblies) for the PHAs (Prebreathe Hose Assemblies), which have reached the inflation cycle limit, with two new units.

Later, Garrett also undertook the monthly FDS PEP (Portable Emergency Provisions) safety inspection/audit in the ISS modules. *[The JLP contains only a PFE (Portable Fire Extinguisher). The IMS (Inventory Management System)-supported inspection involves verification that PFEs, PBAs (Portable Breathing Apparatus), QDMAs and EHTKs (Extension Hose/Tee Kits) are free of damage to ensure their functionality, and to track shelf life/life cycles on the hardware (QDMA harness inspection was not required this time).]*

After a review by the two Flight Engineers of an uplinked description of the planned COL (Columbus Orbital Laboratory) condensate collection system troubleshooting, Reisman removed the CWWDF (Contingency Waste Water Dump Filter) in the Lab forward end-cone from the waste water bus. *[Purpose: to protect the filter from the pressures that are possible during the troubleshooting (>20 psi). Background: Since activation of the Columbus condensate system, ground specialists have suspected a partial blockage of the condensate line from COL through Node-2 into the Lab. Ground-commanded troubleshooting has had inconclusive results. Starting today, the crew performs a two-day sequence of troubleshooting steps: Today, safing the waste water bus, which involved rotating the LAB1D1 rack for access, plus initial setup of the sample bag for collecting condensate; and tomorrow the final setup for the troubleshooting with periodic checks of the condensate collected within the sample bag, followed by the tear-down.]*

Volkov conducted the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, while Kononenko performed the

monthly 30-min. servicing of the toilet facility (ASU), changing out replaceable ASU parts with new components, i.e., the urine receptacle (MP) and a filter insert (F-V). The old parts were discarded as trash.

The FE-2 completed the periodic offloading of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1054) with the collected water slated for processing. No samples were required this time. *[Estimated offload time before reaching the tank's neutral point (leaving ~6 kg in the tank): ~20 min.]*

The CDR performed the daily IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Oleg had ~15 min set aside for another Russian "Uragan" (hurricane) earth-imaging session, using the Nikon D2X digital camera with 300-800 mm telephoto lens from SM window 9 and the RSK1 laptop for picture download. *[Targets uplinked for today were general views of Moldova and Transdniestria in nadir, the Kerch Strait, and overlapping snapshots along the Greater Caucasus Mountain Range including Olympic tracks.].*

Garrett did the periodic (monthly) inspection of the RED (Resistive Exercise Device) canister cords and accessories.

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED (FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

Afterwards, Reisman transferred the crew's exercise data file to the MEC (Medical Equipment Computer) laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Volkov & Kononenko again had the regular full hour for themselves for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residency.

After setting up the Russian TV equipment, the two cosmonauts downlinked cordial messages of greetings and congratulations to a number of popular events in Russia. *[Downlinks were transmitted - (1) for the 70th Anniversary of the 43rd Independent Naval Air Force Strike Regiment stationed in Sevastopol (the regiment of fallen cosmonauts Georgy Dobrovolsky & Valentin Bondarenko), (2) to*

participants in the "Svyaz-Ekspokomm 2008" trade show for telecommunications, navigational equipment, control systems and information technology in Moscow on May 12-16, (3) for the 75th Anniversary of OAO Izhevskiy Motozavod Aksion-Holding Company, manufacturer of missile & spaceflight equipment since 1949, and (4) for the 85th birthday of Isaak Iosifovich Shvarts, composer of the music for the famous film "White Sun of the Desert", a lucky talisman for all cosmonauts who traditionally view a screening of the film before their launch.]

At ~4:30pm EDT, Garrett Reisman is scheduled for his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

Soyuz TMA-12 Relocation: RSC-Energia is reviewing a possible deferral of the 16S relocation from DC1 to FGB and a commensurate change of Progress 29P linkup to the FGB nadir docking port.

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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Solar Beta Angle -- -29.4 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 124 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54069

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/07/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port) – ***Under Review***
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1) – ***Under Review***
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06/02/08 -- STS-124/Discovery/1J docking

07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
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11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
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12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
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4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/27/08
Date:	Sunday, April 27, 2008 11:57:49 AM
Attachments:	

ISS On-Orbit Status 04/27/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – crew off duty. Ahead: Week 2 of Increment 17.*

Russian Holiday:

Orthodox Easter *(Pravoslavnaya Paskha)*

[always 1st Sunday after 1st full moon].

At ~5:23am EDT, CDR Volkov & FE-1 Kononenko conducted a teleconference via VHF with Patriarch Alexis II of the Russian Orthodox Church who extended best wishes on the occasion of today's Easter celebration.

The CDR completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including ASU toilet facilities systems/replaceables and today also number & dates of water & urine containers, counter readings of water consumption (SPK-U, SVO) & urine collection, plus data and total operating time of the Russian POTOK-150MK (150 micron) air filter unit of the SOGS air revitalization subsystem.

Working from the Russian voluntary "time permitting" task list, the FE-1 performed Part 2 of the latest Russian "Uragan" (hurricane) earth-imaging session, using the Nikon D2X digital camera with 300-800 mm telephoto lens. *[Targets uplinked for today were Ugra National Park, the Tien-Shan mountains with glaciers to the east of lake Issyk-Kul, the Volga-Akhtubinsk alluvial plain (overall hydrological situation), and oil spills on the Caspian Sea].*

Also as a discretionary task, Oleg Kononenko conducted his first run of the Russian DZZ-2 "Diatomeya" ocean observations program. *[Using the NIKON F-5 digital still camera with 80-200 mm lens and the HDV (high-definition) video camcorder, Oleg focused on color bloom patterns in the ocean, highly pronounced cloud cover anomalies, swirls, wakes of subsurface waves, water level drop, smoothing lanes in wave fields. Target zones in the Atlantic Ocean were the coastal area of Canada,*

the English Channel, the Newfoundland Island coastline and the West Sahara offshore areas.]

For Sergey Volkov, the “time permitting” job list today suggested more KPT-3 observations and aerial photography for Russia's Environmental Safety Agency (ECON) using the Nikon D2X digital camera with SIGMA 300-800mm telephoto lens.

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

No CEO (Crew Earth Observations) photo targets uplinked for today.

CEO photography can be studied at this “Gateway” website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:22am EDT [= epoch]):*
Mean altitude -- 342.4 km
Apogee height -- 347.5 km
Perigee height -- 337.3 km
Period -- 91.38 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.00076
Solar Beta Angle -- -32.1 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 120 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54053

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/07/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)

09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/26/08
Date:	Saturday, April 26, 2008 12:36:26 PM
Attachments:	

ISS On-Orbit Status 04/26/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – half-day off for CDR Volkov, FE-1 Kononenko & FE-2 Reisman.*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the Service Module (SM) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

As part of the house cleaning, CDR Volkov conducted preventive maintenance cleaning on the VPkhO & VPrK fan grilles in the SM, V3 screen in the DC1 Docking Module and TsV2 grille in the FGB *(Funktsionalnyi-Grusovoi Blok)*.

The CDR later completed the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM including ASU toilet facilities systems/replaceables and today also the periodic cleaning of the pre-filter of the POTOK air filtration system.

At ~9:15am EDT, the crewmembers held their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP/Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

After Houston flight controllers deactivated the CDRA (Carbon Dioxide Removal Assembly) yesterday and cooling is no longer required, Flight Engineer Reisman

today disconnected the ITCS LTL QD (Internal Thermal Control System/Low Temperature Loop/Quick Disconnect) jumper to the CDRA rack (at loc. LAB1D6).

For his VolSci (Voluntary Science) program today, Garrett reviewed OBT (Onboard Training) material for the SLAMMD (Space Linear Acceleration Mass Measurement Device) equipment on the HRF1 (Human Research Facility 1) rack, set up the equipment and performed a configuration check (control runs with no assistance) of the hardware to verify calibration & communication for upcoming experiment ops. *[As "Operator", Garrett will be the safety "spotter" for SLAMMD. The experiment provides an accurate means of determining the on-orbit mass of humans spanning the range from the 5th percentile Japanese female and the 95th percentile American male. The procedure, in accordance with Newton's 2nd Law of Motion, finds the mass by dividing force, generated by two springs inside the SLAMMD drawer, by acceleration measured with a precise optical instrument that detects the position versus time trajectory of the SLAMMD guide arm and a micro controller which collects the raw data and provides the precise timing. The final computation is done via portable laptop computer with SLAMMD unique software. To calculate their mass, crewmembers wrap their legs around a leg support assembly, align the stomach against a belly pad and either rest the head or chin on a head rest. For calibration, an 18-lbs. mass is used at different lengths from the pivot point, to simulate different mass values. Allowable crew mass range is from 90 to 240 lbs. During the SLAMMD control run, cables or other crew members must be out of the way so the hardware moves freely.]*

The FE-2 finished the first session for Inc-17 (and the 28th aboard ISS) of the experiment EarthKAM (Earth Knowledge Acquired by Middle School Students) from the University of California in San Diego, by disassembling and stowing the hardware. *[EarthKAM was activated on 4/19, for the first time in Node-2, at the nadir hatch window, since the Lab science window still needs to be shuttered to protect it against outgassing from the SPDM (Special Purpose Dexterous Manipulator) Dextre. EarthKAM is an education program that enables thousands of students to photograph and examine Earth from the unique perspective of space, integrating the excitement of ISS with middle-school education. The student requests are uplinked in a camera control file to an A31p SSC (Station Support Computer) laptop which then activates the camera, a DCS 760 electronic still camera with 50mm (f/1.4) lens, at specified times and receives the digital images from the camera's storage card on its hard drive, for subsequent downlink via OPS LAN. EarthKAM captured 1033 images for the data-gathering session from 4/22 to 4/26. During this go-around, 60 schools participated (approximately 2800 students) from Argentina, Canada, Columbia, Germany, Japan, Mexico, Spain, South Korea and the United States. 681 images were taken with the 50mm lens and 352 were captured with the 180mm lens after Garrett's lens change on 4/24.]*

Afterwards, Reisman returned the two stowage bags #1007 & 1009 from their temporary location at NOD2P2 (to make room for EarthKAM) to the NOD2D2 nadir hatch stowage location.

Volkov & Kononenko had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-9 laptop), Sergey at 7:10am, Oleg at 8:40am.

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

Afterwards, Garrett downloaded the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Working from the Russian voluntary "time permitting" task list, Kononenko performed a session of the Russian "Uragan" (hurricane) earth-imaging program, using the Nikon D2X digital camera with 300-800 mm telephoto lens. *[Targets uplinked for today were Ugra National Park, the Don river valley, general views of the Southern Urals & the Volga-Akhtubinsk river flood plain from Volgograd to the Caspian Sea, water flooding followed hydropower plant gate opening, oil spills on the Caspian Sea, overall views of the Aral Sea with dust storms (if visible), the tips of Pamir glacier tongues (in nadir), mountain peaks of Tibet with glaciers, major peaks of the Himalayas, the Dniestr River valley, the Kerch Strait, Mzyt river valley, the site of future Olympic games from Adler airport to the upper reach of the river, glaciers on the north slope of the Greater Caucasus Range, the Kolka glacier, and general views of the Caspian Sea].*

Also from the discretionary task list, Oleg conducted a KPT-3 session to make observations and take aerial KPT-3 photography of water contamination in the Kerch Strait for Russia's Environmental Safety Agency (ECON) using the Nikon D2X digital camera with SIGMA 300-800mm telephoto lens.

Weekly Science Update *(Expedition Seventeen -- Week 1)*

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS):
Measurements continue in FGB module. Inc16 science data returned on 15S.

ANITA: Completed.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): The Cell Wall/Resist Wall Experiment Containers are located in EMCS. Water hydration troubleshooting is ongoing. B3 and B4 hydration succeeded.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): In progress.

EarthKAM (Earth Knowledge Acquired by Middle School Students): EarthKAM captured 1033 images for the data-gathering session from 4/22 to 4/26. Sixty schools participated (approximately 2800 students) from schools in Argentina, Canada, Columbia, Germany, Japan, Mexico, Spain, South Korea and the United States. 681 images were taken with the 50mm lens and 352 were captured with the 180mm lens. The camera was setup in the Node-2 nadir hatch window.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Inc16 science data were returned on 15S.

EuTEF (European Technology Exposure Facility): On 4/20, EuTEF platform encountered a MIL Bus error. Ground operators performed a graceful shutdown, power cycled and fully recovered the platform and its instruments. - DEBIE-2: Link error still under investigation; - DOSTEL: On-going science acquisition; - EuTEMP: Currently inactive as planned; - EVC: Further troubleshooting is on-going; - EXPOSE: On-going science acquisition; - FIPEX: Long-duration measurements with sensors RAM1, RAM4 and ZENITH8 have started on 4/23; - MEDET: On-going science acquisition, running nominal, except sample wheel of the Spectrometer is blocked on "park" position; - PLEGPAY: Langmuir Probe run was successfully

performed during the 15S undocking on 4/19 via direct commanding; - TRIBOLAB: On 4/15, the Pin On Disk (POD1) run was suddenly stopped after we encountered much higher than anticipated friction coefficients measurements. After analysis, it was decided to resume this POD1 run on 4/21. But TRIBOLAB went again immediately to a stop mode again, meaning that POD1 run is considered completed.

FSL (Fluid Science Laboratory): The mechanical troubleshooting of the FSL Drawers was successful on 4/23, as FSL activation from ground on 4/24 confirmed that all the FSL laser switches are properly engaged and fully functional.

GEOFLOW: Start of GEOFLOW is pending further FSL commissioning activities (check of FSL optical modes) currently planned for next week.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Inc16 Blood and urine samples have been returned with 15S and handed over to science team.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Complete.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION/REPOSITORY: In progress.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems):

Ongoing.

SAMPLE: Inc16 samples have been downloaded with 15S and handed over to science team.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): In progress.

SOLAR (Solar Monitoring Observatory): The Sun observation is now closed (Beta angles higher than 24 deg), and will resume on 4/30. On 4/18, the instruments were put in safe mode for the 15S undocking. - SOVIM: Waiting for the Sun; - SOLSPEC: Waiting for the Sun; - SOLACES: Waiting for the Sun.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): The 4 ECs (Experiment Containers) of Rotor B are yet to be retrieved by the crew from the blocked Rotor B.

CEO (Crew Earth Observations): "Greetings to the Increment 17 crew from the staff of Crew Earth Observations! We look forward continuing to work with you in support of our payload. We have already started to receive your imagery; through 4/20 we have received 73 frames including an excellent, unsolicited sequence for one of our science targets: Santorini Volcanic Complex, Greece. We will evaluate this to decide whether any additional imagery of this target is required. By way of continuity we have received a total 18,678 frames through 4/18 for Increment 16. This included excellent 400mm views of the Slate Island Impact Crater site in Lake Superior. Only 800mm views are needed to complete this site. Nice going! Also your striking view of the Cerro Culiacan volcano in west-central Mexico will be published on NASA/GSFC's Earth Observatory website this weekend. It is a fine example of a radial drainage pattern and the integration of agriculture in rich volcanic soils. Good shot!"

CEO photo targets uplinked for today were **Chongqing, China** *(nadir pass over this famous city situated on the Yellow River in the Red Basin. The population of*

Chongqing proper is 4 million, but 31 million cluster in the county of Chongqing. Images looking obliquely at the mountain walls around the basin in which Chongqing lies can also reveal the density and altitude of the persistent smog blanket), **Dhaka, Bangladesh** *(the metro area population is almost 12 million. The crew was to shoot margins of the city. Looking left, two famous rivers were the visual cue: Dhaka lies on the far side of the Ganges River, between the very wide Brahmaputra River and the much smaller Meghna River),* and **Harvard Forest, Vermont** *(looking left and shooting the forest which lies approximately half way between the ground track and Boston. The 1200-hectare site includes a variety of forests and wetlands. Research at the Forest focuses on effects of natural and human disturbances on forest ecosystems)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:02am EDT [= epoch]):*
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Apogee height -- 347.3 km
Perigee height -- 337.8 km
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Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007076
Solar Beta Angle -- -34.5 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 206 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54037

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/07/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)

10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/25/08
Date:	Friday, April 25, 2008 1:57:41 PM
Attachments:	

ISS On-Orbit Status 04/25/08

All ISS systems continue to function nominally, except those noted previously or below.

FE-2 Reisman continued his support of the experiment CSLM-2 (Coarsening in Solid-Liquid Mixtures 2) in the MSG (Microgravity Science Glovebox), today concluding the processing of SPU-8 (Sample Processing Unit 8), transferring the data from the ECU (Electronics Control Unit) to the MSG laptop, then removing SPU-8 from the WV (Work Volume) and installing SPU-7 for the next run. MSG was later powered down from its A31p laptop (~8:30am EDT). *[CSLM-2 examines the kinetics (e.g., growth rate) of "competing" particles within a liquid matrix. During this process, small particles shrink by giving up atoms to larger particles, causing the larger particles of tin, suspended in a liquid comprised of molten lead/tin alloy ("matrix"), to grow in size ("coarsen"). This study defines the mechanisms and rates of coarsening that govern the manufacture with metals from turbine blades to dental amalgam fillings.]*

As is standard for new Expeditions, the two Russian crewmembers, Volkov & Kononenko, performed the periodic 3-hr. routine health checkout on the RS (Russian segment)'s STTS telephone/telegraph subsystem, including inspection and audio function checks of all comm panels (PA) in and between the Service Module (SM), FGB and Docking Compartment (DC1), VHF receiver tests, and an audit of headsets. *[The "Voskhod-M" STTS enables telephone communications between the SM, FGB, DC1 and U.S. segment (USOS), and also with users on the ground over VHF channels selected by an operator at an SM comm panel, via STTS antennas on the SM's outside. There are six comm panels in the SM with pushbuttons for accessing any of three audio channels (LINE-1,-2,-3), plus an intercom channel (VPU). Other modes of the STTS include telegraphy (teletype), EVA voice, emergency alarms, Packet/Email, and TORU docking support. Last time done 11/30/07 by Malenchenko & Tani.]*

The three crewmembers performed the mandatory CHeCS (Crew Health Care Systems) emergency/contingency medical OBT (on-board training) drill, a one-hour U.S. exercise designed to refresh crewmembers' acuity in applying HMS (Health Maintenance System) equipment like ACLS (Advanced Cardio Life Support) in an emergency. *[The drill gives crewmembers the opportunity to work as a team in resolving a simulated medical emergency onboard ISS and to refresh their memory of on-orbit stowage and deployment locations, equipment use, and procedures. Setting up (but not actually operating/manipulating) onboard equipment such as the RSP (Respiratory Support Pack), ALSP (Advanced Life Support Pack), intubation kit, HMS defibrillator, all stowed in the Lab CHeCS rack, and the CMRS (Crew Medical Restraint System), Garrett, Sergey and Oleg stepped through the ACLS algorithm manual to resolve a simulated medical emergency onboard ISS. Objectives of the exercise include practicing communication and coordination necessary to perform medical emergency procedures, locating appropriate emergency medical components, and determining each crewmember's individual method of delivering CPR (cardio-pulmonary resuscitation) in zero-G.]*

FE-2 Reisman conducted the periodic (monthly) CSA-CP (Compound Specific Analyzer-Combustion Products) maintenance/checkout, today on all four units. *[The CSA-CP is a passive cabin atmosphere monitor that provides quick response capability during a combustion event (fire). Its collected data are stored on a logger. Garrett changed out the battery on the prime unit, then zero-calibrated all instruments (to eliminate drift in the combustion sensors). Following zero calibration, the backup units were stowed in the Node, along with the sampling pump, while the prime unit was deployed at the SM Central Post.]*

Reisman also gathered measurements for the regular atmospheric status check for $ppCO_2$ (Partial Pressure Carbon Dioxide) in the Lab, SM (at panel 449) and COL (Columbus Orbital Laboratory), using the hand-held CDMK (CO_2 Monitoring Kit, #1002) and recording CO_2 readings and battery "ticks". Batteries were to be replaced if necessary.

Later, the FE-2 completed a run with the MedOps experiment WinSCAT (Windows Spaceflight Cognitive Assessment Tool) by logging in on the MEC (Medical Equipment Computer) and performing the psychological evaluation exercise on the laptop-based WinSCAT experiment. It was Garrett's second onboard session. *[WinSCAT is a time-constrained questionnaire test of cognitive abilities, routinely performed by astronauts aboard the ISS every 30 days before or after the PHS (periodic health status) test or on special CDR's, crewmembers or flight surgeons request.]*

Reisman also filled out the regular FFQ (Food Frequency Questionnaire), his sixth,

on the MEC (Medical Equipment Computer). *[On the FFQs, NASA/ESA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily. Latest food count (as of 4/20): 287 containers with 903.5 rations (456 US/447.5 Russian). Rate of food consumption by Exp-16 was 396 rations used in 190 days by three persons = 69% of one ration/person/day.]*

As standard procedure for newly arrived station residents, Volkov & Kononenko filled out the questionnaire for the standard Russian biomedical Braslet-M/Anketa ("bracelet/questionnaire") test procedure. *[If desired, the crewmembers may evaluate a number of "bracelet" cuffs for their usefulness in suppressing the adverse effects of micro-G for the "newcomer" aboard the station during the acute phase of adaptation to weightlessness, if there are such indications. The "bracelets" are compression cuffs attached to a belt and worn on the upper thighs over the coveralls, intended as countermeasures against the initial micro-G effects of blood filling (vascularity) in the upper torso (heaviness and blood pulsation in the head), facial puffiness, nasal stuffiness, painful eye movement, and vestibular disorders (dizziness, nausea, vomiting). They create artificial blood accumulation in the upper thirds of the thighs, causing some of the circulating blood volume to relocate from the upper body to the lower extremities, thereby (hopefully) correcting the adverse hemodynamic effect of micro-G and thus improving the crewmember's working capability. The actual compression cuff in the Braslet units is a combination of alternating multi-layer tensile and non-tensile elements, whose distension by body movements creates elastic forces that produce the necessary pressure on the body surface. The questionnaire lists bracelet types, days worn, cuff tension used, wearing method (on body or over clothing), thigh cuff positioning, etc.]*

Garrett supported a new ground-commanded upgrading of the PCS (Portable Computer System) laptops with a patch required for the upcoming JEM/1J mission, including such data as C&W (Caution & Warning) messages, emergency texts for NH_3 leak events, etc. *[The FE-2 powered up all PCS machines and deployed a stowed laptop in Node-2, after which each machine was patched by the ground and then reconnected to the C&C MDM (Command & Control Multiplexer/Demultiplexer computer) after automatic reboot. Afterwards, Garrett configured the COL, LAB & SM PCS laptops and called down their battery charge levels.]*

Later, Reisman also performed the regular bi-weekly reboots of the SSC (Station Support Computer) File Server and OCA Comm Router laptops.

Earlier, the FE-2 downloaded the structural dynamics data collected last night during the ATV reboost by the IWIS (Internal Wireless Integrated System) from the RSUs (Remote Sensor Units) and NCU (Network Control Unit) to the SSC (Station Support Computer) laptop for subsequent downlink to the ground. The IWIS gear was then disassembled and removed.

Additionally, Garrett completed the periodic checkup on active U.S. payloads, i.e., cleaning the ANITA (Analyzing Interferometer for Ambient Air) inlet plus inspecting and filter cleaning of the CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) incubator payload. *[The CGBA incubator is controlled from the ground, with automatic video downlinked to Earth. ANITA is now back up again and running, collecting data every six seconds and downlinking the data daily to the ground team. ANITA monitors low levels of potential gaseous contaminants in the ISS cabin atmosphere with a capability of simultaneously monitoring 32 gaseous contaminants. The experiment is testing the accuracy and reliability of this technology as a potential next-generation atmosphere trace-gas monitoring system for ISS and future spacecraft. This is a cooperative investigation with ESA.]*

In preparation for the following PAO TV event, Reisman set up and activated the VDS MPC (Video Distribution System/Multi-Purpose Converter) with its four downlinks for transmitting SONY PD-100 camcorder imagery. Later (~12:00pm), the MPC was powered off again.

At ~11:35am, Garrett engaged in two PAO TV interviews with US clients,- WCBS-TV, New York (Dana Tyler, Jim Rosenfeld), and WOFL-TV, Orlando, FL (Mike Dunston, Holly Bristow).

Kononenko completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC (Contingency Water Container) from the Lab humidifier. Weekly SOZh reports (on Sundays) to TsUP/Moscow deal with number & dates of water and urine containers, counter readings of water consumption (SPK-U, SVO) & urine collection, plus data and total operating time of the Russian POTOK-150MK (150 micron) air filter unit of the SOGS air revitalization subsystem.]*

Volkov took on the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The camcorder setup in the SM for filming the workout of all crewmembers on the RED resistive exerciser in Node-1 during the last two days was today focused on the TVIS (Treadmill with Vibration Isolation & Stabilization) for similar documentation of their treadmill workout (with the TVIS skirt removed for visibility). Later, Reisman removed and stowed the video equipment. *[The periodic videos are required for biomechanical assessment of hardware status by ground engineers.]*

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

Afterwards, Garrett downloaded the crew’s exercise data file to the MEC for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~4:00am, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU, [Glavnaya operativnaya gruppa upravleniya = “Main Operative Control Group”]), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~8:45am, Sergey & Oleg linked up with TsUP-Moscow stowage specialists via S-band to conduct the weekly IMS tagup, discussing transfer details and stowage locations. *[Discussions today concerned the current whereabouts of the 800A storage battery removed in the SM on 4/23 and of the BNP Portable Repress Tank transferred from Soyuz TMA-11 on 4/19.]*

At ~3:10pm, the crewmembers are scheduled for their regular weekly tagup with the Lead Flight Director at JSC/MCC-H.

Listed on the crew’s “job jar” task list for today was a battery check & reboot on the PWS (Portable Workstation) laptop in the COL.

ATV Reboost Update: The overnight ISS reboost with the ATV1 “Jules Verne” main engines was started at 12:22am EDT for 12m 15s and completed successfully. Planned Delta-V was 2.64 m/s vs. 2.66 m/s actual, resulting in a

mean altitude increase of 4.64 km (2.51 nmi). Purpose of the reboost maneuver was to set up the proper phasing (central orbit sweep angle) for the upcoming launches of 29P and STS-124/1J. ISS attitude control authority was handed over to RS MCS (Motion Control System) at 11:15pm for the subsequent maneuver to reboost attitude at 11:20pm. After the burn, the station was turned back to TEA (Torque Equilibrium Attitude) and returned to US Momentum Management at ~1:25am.

CDRA Update: The Carbon Dioxide Removal Assembly (CDRA) was activated yesterday when the CO_2 level peaked at 5.4 mmHg. After running for ~24 hrs, it was turned off again today starting at ~9:00am. *[The RS Vozdukh CO2 scrubber is more effective when the CO_2 levels are higher, so normally the $ppCO_2$ will slowly rise over about a week and stabilize between 5 & 6 mmHg, which is within Flight Rule limits but has been known to cause symptoms in some more susceptible crewmembers. Therefore, Flight Control activated the CDRA yesterday temporarily as a pre-emptive measure.]*

COL Condensate Issue Update: Since activation of the Columbus condensate system, ground specialists have suspected a partial blockage of the condensate line from COL through Node-2 into the Lab. Ground-commanded troubleshooting has had inconclusive results. The ISS crew will now be required to temporarily disconnect the condensate (waste water) jumper in the Node-2/COL vestibule in order to obtain flow rate data as a step towards possibly locating the site of the blockage. *[Starting next Monday, there will be a two-day sequence of steps to be performed by the crew: On 4/28, safing the waste water bus and initial setup of the sample bag for collecting condensate; on 4/29, final setup for the troubleshooting with periodic checks of the condensate collected within the sample bag, followed by the tear-down.]*

MCAS Checkout: For today's ground-commanded checkout of the Robotics MCAS (Mobile Base System [MBS] Common Attachment System) at ~2:00pm, requiring UMA (Umbilical Mechanism Assembly) mating, later demating, the RS thrusters were disabled at 1:10pm until ~3:15pm and physical exercise restricted, both due to loads constraints.

CEO (Crew Earth Observation) photo targets uplinked for today were **Tigris-Euphrates Delta** *(nadir views of the coastline were requested), Mt. Etna, Sicily (nadir views were requested),* **Tin Bider Impact Crater, Algeria** *(this 6-km-diameter crater is a dark circular feature off track left. The crater lies between a dry inland delta under track, and a major dune field [erg], the Grand Erg Oriental),* and **Virginia Coast Reserve, Virginia** *(this environmental site is the barrier island-lagoon-mainland landscape of the Eastern Shore of Virginia. Looking left on the*

seaward side of the Delmarva Peninsula, close to the southern tip).

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 9:26am EDT [= epoch]):*
Mean altitude -- 342.7 km
Apogee height -- 347.6 km
Perigee height -- 337.8 km
Period -- 91.39 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007277
Solar Beta Angle -- -36.5 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude gain in the last 24 hours -- 4600 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54022

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/07/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch

11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/28/08
Date:	Thursday, April 24, 2008 2:43:49 PM
Attachments:	

ISS On-Orbit Status 03/28/08

All ISS systems continue to function nominally, except those noted previously or below.

As per his voluntary “job jar” task list, after wakeup and before breakfast FE-2 Garrett Reisman completed his first session with the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment software for data logging and filling in questionnaire entries in the experiment’s laptop session file on the HRF-1 laptop. *[To monitor the crewmember’s sleep/wake patterns and light exposure, Garrett wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

FE-1 Yuri Malenchenko serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out" cycle to vacuum on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process was terminated before sleeptime, at ~4:30pm EDT. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. Filter bed 1 was regenerated yesterday.]*

After reviewing the ATV rendezvous & docking timeline plus uplinked RODF (Russian Operations Data File) crew procedures, CDR Whitson & FE-1 Malenchenko used the onboard ATV Rendezvous, Docking & Undocking simulator software to conduct training runs.

Later, Whitson set up the video gear for Ku-band analog & digital video downlink, in support of engineers testing the ATV docking video transmission to the ground. Afterwards, the CDR deactivated the A31p laptop used for the downlink.

Peggy & Garrett had about half an hour reserved to work on the CMRS (Crew

Medical Restraint System), stowed in the CHeCS (Crew Health Care Systems) rack, performing the periodic checkout and inspection of the system for upcoming standard CMO (Crew Medical Officer) proficiency training. *[The crew inspected the CMRS for cracks in the board and/or metal fastener exposed on top of CMRS (found on the ground units), either of which could provide a high-voltage defibrillation ground path from the patient to ISS structure. The board-like CMRS allows strapping down a patient on the board with a harness for medical attention by the CMO who is also provided with restraints around the device. The device can be secured to the ISS structure within two minutes to provide a patient restraint surface for performing emergency medical procedures, such as during ACLS (Advanced Cardiac Life Support). It can also be used to transport a patient between the station and the Orbiter middeck. It isolates the crew and equipment electrically during defibrillations and pacing electrical discharges, accommodates the patient in the supine zero-G positions, provides cervical spine stabilization and, for a three-person crew, can also restrain two CMOs during their delivery of medical care.]*

Reisman also performed the regular inspection and checkout of the HMS RSP (Health Maintenance System/Respiratory Support Pack).

After setting up the Rodnik “plumbing” gear on 3/22 and testing the Progress 28P’s BV1 tank bladder for leak tightness, Malenchenko today transferred accumulated urine from two EDV containers (#381, #360) to the BV1 water tank. *[Each of the two spherical Rodnik tanks consists of a hard shell with a soft membrane (bladder) composed of elastic fluoroplastic. The bladder is used to expel water from the tank by compressed air pumped into the tank volume surrounding the membrane.]*

With the US ER3 (EXPRESS Rack 3) now located in the COL (Columbus Orbital Laboratory) as of 3/22, Garrett Reisman installed the cables for the rack’s EMCS (European Modular Cultivation System) facility, then configured the EMCS power switch to On and opened the gas valves, preparatory to the EMCS checkout scheduled tomorrow. *[The EMCS rack contains a rotating centrifuge that can support a wide range of small plant and animal experiments under partial gravity conditions. The EMCS gas valves must be opened manually within 24 hours prior to EMCS facility powerup if the power up is performed via ground commanding.]*

In the Lab, Whitson connected the regular ITCS LTL (Internal Thermal Control System/Low Temperature Loop) coolant jumper at the LAB1D6 rack in support of ground-commanded activation of the U.S. CDRA (Carbon Dioxide Removal Assembly) at 12:10pm-12:40pm EDT for troubleshooting the unit. Peggy supported the blower on/off activity by removing (later reinstalling) ducting between ASV (Air Supply Valve) 102 and absorbent bed 2.

Malenchenko conducted the periodic (monthly) functional closure test of the Vozdukh CO2 removal system's spare emergency vacuum valves (AVK), in the spare parts kit. *[The AVKs are critical because they close the Vozdukh's vacuum access lines in the event of a malfunction in the regular vacuum valves (BVK) or a depressurization in the Vozdukh valve panel (BOA). Access to vacuum is required to vent* CO2 *during the regeneration of the absorbent cartridges (PP). During nominal operation, the AVK valves remain open.]*

After preparing the auditory test equipment, Peggy, Yuri & Garrett each took the periodic (monthly) O-OHA (On-Orbit Hearing Assessment) test, a 30-min. NASA environmental health systems examination to assess the efficacy of acoustic countermeasures, using a special MEC (Medical Equipment Computer) laptop application. It was the fourth session for the CDR & FE-1, the first for the FE-2. *[The O-OHA audiography test involves minimum audibility measurements for each ear over a wide range of frequencies (0.25-10 kHz) and sound pressure levels, with the crewmembers using individual-specific Prophonics earphones, Bose ANC headsets and the SLM (sound level meter). To conduct the testing, the experimenter is supported by special EarQ software on the MEC, featuring an up/ down-arrow-operated slider for each test frequency that the crewmember moves to the lowest sound pressure level at which the tone can still be heard. The baseline test is required not later than about Flight Day 14 for each new Expedition and is then generally performed once per month. Note: There have been temporary hearing deficits documented on some U.S. and Russian crewmembers, all of which recovered to pre-mission levels.]*

For the Russian flight engineer, it was time today for his first orthostatic hemodynamic endurance test session with the Russian Chibis suit in preparation for his return to gravity on 4/19, conducting the MedOps MO-4 exercise protocol in the below-the-waist reduced-pressure device (ODNT, US: LBNP/Lower Body Negative Pressure). With Peggy assisting her crewmate as CMO (Crew Medical Officer), the one-hour session was supported by ground specialist tagup via VHF at ~12:01pm EDT on DO1. *[The Chibis provides gravity-simulating stress to the body's cardiovascular/circulatory system for evaluation of Malenchenko's orthostatic tolerance (e.g., the Gauer-Henry reflex) after 200 days in zero-G. Data output include blood pressure readings.]*

In the US Lab, FE-2 Reisman set up the hardware associated with urine and blood collections for his first session of NASA's NUTRITION w/Repository experiment, scheduled on his timeline tomorrow, requiring Garrett to start his mandatory 8-hr fasting tonight for the blood draw. *[The 24-hr urine sampling begins with the first void tomorrow morning and continues through the first void on Sunday morning. The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes*

measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]

CDR Whitson removed closeout panels in the Lab for IFM (Inflight Maintenance) of the port IMV (Intermodular Ventilation) valve of the THC (Temperature & Humidity Control) system, working with the ground to adjust the valve RMO (Remote Manual Override).

Yuri Malenchenko had another hour set aside for his end-of-increment cleanup and departure preparations. *[Instructions on packing of return items and a keep vs. trash list were uplinked for assisting Yuri and Peggy in their preparing for their return in the severely downmass-limited Soyuz Descent Module. Trashed items will be stowed in the Orbital Module, to be separated along with the Instrumentation/ Propulsion Module prior to atmospheric entry.]*

Garrett Reisman spent ~60 minutes for general orientation (station familiarization & acclimatization), as is standard daily rule for the first two weeks after starting station residency

Afterwards, the FE-2 performed the regular monthly & quarterly maintenance of the TVIS (Treadmill with Vibration Isolation & Stabilization), inspecting the condition of harnesses, belt slats, corner bracket ropes, IRBAs (Isolation Restorative Bungee Assemblies) and gyroscope wire ropes for any damage or defects, lubricating as required plus recording time & date values.

Malenchenko completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Later, Yuri conducted the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Working off his “available time” discretionary task list, the FE-1 performed the

regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder).

Also from the voluntary task list, Yuri supported the BIO-5 Rasteniya-2 ("Plants-2") experiment, which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}), by checking status and taking photographs. The crewmembers performed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, the CDR transferred the crew's exercise data file to the MEC laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

After setting up and activating the VDS MPC (Video Distribution System/Multi-Purpose Converter) with its four downlinks to allow the ground to receive HDTV (high-definition TV) downlink, the crew at 11:00am sent down two PAO TV messages for recording and later playback, one for Yuri's Night at NASA ARC (Ames Research Center), the other for the annual "VEISHEA" celebration at Iowa State University (ISU). Later (~11:35am), the MPC was powered off again. *[The annual Yuri's Night Celebration, held around the world on 4/12, commemorates the anniversary of Yuri Gagarin's launch on April 12, 1961 to become the first human in space, and the maiden flight of the Space Shuttle "Columbia" with John Young & Bob Crippen twenty years later – on April 12, 1981. ISU's "VEISHEA" event is an annual celebration held each spring and one of ISU's oldest traditions. The name VEISHEA combines the first letters of the colleges at the origin of VEISHEA in 1922: Veterinary Medicine, Engineering, Industrial Science, Home Economics, Agriculture. ISU also recognized Clay Anderson as a distinguished alumnus.]*

At ~4:20am EDT, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~5:05am, the FE-1 linked up with TsUP-Moscow stowage specialists via S-band to conduct the weekly IMS tagup, discussing stowage issues and equipment locations.

At ~9:00 am, Whitson and Reisman had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which

displays the uplinked ground video on the SSC-10 laptop).
At ~9:50am, the ISS crew held its weekly teleconference with ISS Program Management at JSC/Houston via
Private S/G2, S-band/audio.

At ~4:20pm, the crewmembers will convene for their standard bi-weekly teleconference with the JSC Astronaut Office (Steve Lindsey), via S-band S/G-2 audio & phone patch.

WDS Update: An updated Water Delivery System "cue card" was uplinked for the crew's reference, which includes the five CWCs that were transferred from Endeavour during 1J/A. *[The new card (16-0018Z) lists 39 CWCs (~1551.8 L total) for the four types of water identified on board: technical water (871.5 L, for Elektron, flushing, hygiene), potable water (647.2 L), condensate water (27.3 L), waste/EMU dump and other (5.8 L). Of the 39 containers, 15 CWCs with technical water (640.5 L) cannot be used until cleared for* Wautersia *bacteria, and 4 CWCs with potable water (176.3 L) are not cleared for use pending analysis of samples returned on 1J/A.]*

ATV Update (Flight Day 18): Early yesterday morning, ATV "Jules Verne" departed its parking orbit 2000 km in front of ISS, beginning to phase back to the Rendezvous Initiation point in preparation for ATV Demo Day 1 tomorrow (3/29). The ATV performed the following three maneuvers, all of which were reported to be nominal:

- TA1: start 1:59:37am EDT, delta-V: 1.50 m/s
- TA2: start 2:44:45am, delta-V: 3.24 m/s
- TA3: start 3:28:25am, delta-V: 1.55 m/s.

In addition, the ISS crew completed two of the ATV rendezvous on-board training sessions yesterday and another one today.
The ATV-CC continues to see higher than expected power consumption from the pressurized module shell heaters and is working to identify the reason. The spacecraft is being controlled by ESA's ATV-CC/Toulouse in France, working with TsUP-Moscow and MCC-Houston. On Demo Day 2 (3/31), the ATV begins approaching the ISS from two miles away, maneuvering with a series of engine firings to about 10 m (36 ft) from the station before the ISS crew sends an abort command to move the ATV away from the complex. These maneuvers will test all ATV systems that are required for a safe automated linkup to the ISS three days later (4/3) by means of the ASN PCE (Proximity Communications Equipment) in the SM, or manually as backup.

CEO photo target uplinked for today was Tropical Cyclone Pancho, NW Australia *(DYNAMIC EVENT: Maximum sustained winds predicted to be 65kt, storm tracking*

almost due south. Looking right of track for the eye. Shooting obliques to acquire the very long cloud feeder bands, especially right of track. Short lens settings probably allowed most of the storm to be captured in single views), Patagonian Glaciers *(there was a reasonable chance for clear weather on the dry side [east side] of the Southern Andes Mts. Looking left of track to shoot smaller glacier tongues),* and Pilcomayo River dynamics, N Argentina *(a mapping swath of 400-mm images was requested, looking left of track [for 30–60 secs]—to show the highly complex modern and past stream channel patterns on this largest "river fan" on Earth. These patterns have interesting similarities to "channel" patterns on Mars, for which they are being used as analogs in ongoing research)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:38am EDT [= epoch]):*
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Perigee height – 339.4 km
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Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0001054
Solar Beta Angle -- 43.7 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 102 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53579

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch - ~7:16am *(CDR Sergei Volkov, FE Oleg Kononenko, SFP Yi So-yeon)*
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~8:43am
04/12/08 -- **Cosmonautics Day**, with **Yuri's Night** (check out http://www.yurisnight.net/2008/)
04/19/08 -- Soyuz TMA-11/15S undocking/landing (FGB nadir port)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS

05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.
Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/24/08
Date:	Thursday, April 24, 2008 1:38:51 PM
Attachments:	

ISS On-Orbit Status 04/24/08

All ISS systems continue to function nominally, except those noted previously or below.

Before breakfast and exercise, CDR Volkov & FE-1 Kononenko completed their first session with the periodic Russian MedOps test "Hematokrit" (MO-10), which measures the red cell count of the blood, with FE-2 Reisman acting as CMO (Crew Medical Officer, Russian: Examiner). *[The blood samples were drawn from a finger with a perforator lancet, then centrifuged in two microcapillary tubes in the M-1100 kit's minicentrifuge, and its hematocrit value was read off the tubes with a magnifying glass. It is a well-known phenomenon of space flight that red blood cell count (normal range: 30-45%) tends to go down over time. After the exam, the data were saved in the IFEP software (In-Flight Examination Program) on the MEC (Medical Equipment Computer), and Kononenko stowed the equipment.]*

The new E-17 crew (Sergey, Oleg, Garrett) performed the mandatory two-hour OBT (onboard training) emergency egress drill for the case of rapid cabin depressurization, with Russian & US specialists standing by at both control centers for crew questions or comments. The rule is that the emergency egress exercise should be performed by every new station crew once within seven days after departure of the previous crew. *[Background: Purpose of the drill is to (a) familiarize the station residents with the location of hardware and the positions of valves used in emergency situations, (b) work through the Russian Segment (RS) hardware deactivation procedures, (c) review ATV emergency response material, (d) practice crew emergency joint activities, and (e) identify crew comments and suggestions that arise during training regarding crew procedures and equipment. In the RS, the crew translated along the emergency egress path to the DC1 Docking Compartment (where Soyuz TMA-12 is currently docked), checking hardware such as the Sokol suits, cable cutters, fire extinguisher (OKR), gas masks (IPK), emergency procedures books, valve settings, hatch rubber seal & restraint integrity, etc. In the US Segment (USOS) the inspection focused on fireports being*

unblocked in the Lab {21}, with other US modules to be checked by future crews), readiness of CSA-CP (Compound Specific Analyzer-Combustion Products), ISS leak kit, PBA (portable breathing assembly) and PFE (portable fire extinguisher), emergency procedures books, valve settings, integrity of hatch rubber seals, presence of hatch handrails, etc. The checks also included Node-2, COL (Columbus Orbital Laboratory), and JLP (Japanese Experiment Module Experiment Logistics Module Pressurized Section). The exercise was topped off by a thorough debrief with the ground via S-band. During the session, the crew simulated executing the planned emergency procedures while moving about the station. For the case of an onboard fire and for emergency descent, there are other mandatory emergency drill OBTs.]

CDR Volkov performed the routine task of taking close-up photos of a scuff mark left by the probe of the last Progress' active docking mechanism on the internal part of the FGB passive docking cone mechanism. The pictures were then transferred to OCA for subsequent downlinking. These images are used to refine current understanding of docking conditions. *[The passive drogue (docking cone) ring of the SSVP-StM docking mechanism is rotated out of the passageway and thus accessible for inspection. As other crewmembers before him, the CDR used the Nikon D1X digital still camera to take several pictures with the hatch closed down.]*

FE-1 Kononenko completed another routine radiation data monitoring & logging session for flow & dose power data with the MATRYOSHKA-R radiation payload and its LULIN-5 electronics box. *[Data were downloaded, accumulated readings were recorded on a log sheet for subsequent downlink to TsUP/Moscow via the BSR-TM payload data channel, and the memory storage card was replaced.]*

The FE-1 also broke out the LULIN-ISS radiation complex kit, set up its ICU (Interface Control Unit, Russian: BUI) and connected it to a power outlet plus four PILLE radiation dosimeters to allow its battery to recharge for the next 24 hrs.

In the US Lab, FE-2 Reisman continued his servicing of the CSLM-2 (Coarsening in Solid-Liquid Mixtures 2) experiment, terminating the final vacuum draw on the sample chamber and initiating the sample run for SPU-8 (Sample Processing Unit 8). Activities will resume tomorrow after the sample has undergone ground-commanded processing for four hours overnight, following several hours of untended delay for tracking power consumption. *[CSLM-2 examines the kinetics of competitive particle growth within a liquid matrix. During this process, small particles shrink by losing atoms to larger particles, causing the larger particles to grow (coarsen) within a liquid lead/tin matrix. This study defined the mechanisms and rates of coarsening that govern the manufacture with metals from turbine blades to dental amalgam fillings.]*

Reisman also had ~3h reserved to prepare two SSC (Station Support Computer) laptops for use in the JEM (Japanese Experiment Module), including configuring their settings with uplinked JEM IP addresses.

In response to elevated onboard CO_2 readings, Garrett connected the regular ITCS LTL (Internal Thermal Control System/Low Temperature Loop) coolant jumper to the LAB1D6 rack in support of the ground-commanded activation of the U.S. CDRA (Carbon Dioxide Removal Assembly), and Houston lowered the temperature setpoint to the regular 9.4 degC. *[CDRA activation took place at 7:00am-8:00am.]*

The FE-2 performed the scheduled lens change on the EarthKAM system at the Node-2 hatch window, going from 50mm to 180mm focal length. The lens change had to be performed on the night side while EarthKAM was not taking pictures. *[EarthKAM was activated on 4/19 for a new session, for the first time in Node-2, the 28th time aboard the ISS and the first time on Increment 17. The reason for moving EK to the Node-2 nadir hatch window is that the Lab science window still needs to be shuttered to protect it against outgassing from the SPDM (Special Purpose Dexterous Manipulator) Dextre. The payload runs without crew intervention. EK is using a Kodak ESC 460C electronic still camera with 50mm and 180mm lenses, powered by 16Vdc from a 28 Vdc adapter, taking pictures by remote operation from the ground, without crew interaction. It is available for students who submit image requests and conduct geographic research (student participants include over 84 teachers who are being trained to use EK). The requests are uplinked in a camera control file to the ThinkPad A31p laptop which then activates the camera at specified times and receives the digital images from the camera's storage card on its hard drive, for subsequent downlink via OpsLAN.]*

Continuing the current round of preventive maintenance on the Russian Segment (RS) ventilation system, Oleg replaced the two dust filters (PS1, PS2) in the *Funktsionalnyi-Grusovoi Blok* (FGB), while Sergey worked in the SM on Group A,B, C ventilation subsystems, performing inspection and photography of equipment & structural elements for residue & condensate while cleaning the fan screens.

In the SM, Oleg took the periodic readings of potentially harmful atmospheric contaminants with the CMS (Countermeasure System) part of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, which uses preprogrammed microchips to measure H_2CO (Formaldehyde, methanal), CO (Carbon Monoxide) and NH_3 (Ammonia), taking one measurement per microchip. *[CO was not to be measured today.]*

Garrett Reisman prepared for tonight's ATV1 reboost burn by setting up & re-programming the IWIS (Internal Wireless Instrumentation System) with its NCU

(Network Control Unit) and RSUs (Remote Sensor Units) for acquiring structural dynamics data during the reboost ops. Also activated during the thruster test will be the externally mounted SDMS (Structural Dynamics Measuring System).

Volkov completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC (Contingency Water Container) from the Lab humidifier. Weekly SOZh reports (on Sundays) to TsUP/Moscow deal with number & dates of water and urine containers, counter readings of water consumption (SPK-U, SVO) & urine collection, plus data and total operating time of the Russian POTOK-150MK (150 micron) air filter unit of the SOGS air revitalization subsystem.]*

The CDR also performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The video equipment in the SM remains in place for filming all crewmembers’ subsequent workout on the RED resistive exerciser in Node-1, for biomechanical assessment of hardware status by ground engineers. *[The camcorder equipment will be torn down when the RED sessions of all crewmembers have been captured.]*

The crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

Afterwards, Garrett downloaded the crew’s exercise data file to the MEC for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Volkov & Kononenko again had the regular full hour for themselves for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residency.

At ~9:00am EDT, the three crewmembers convened for their standard bi-weekly teleconference with the JSC Astronaut Office (Steve Lindsey), via S-band S/G-2 audio & phone patch.

At ~2:15pm, FE-2 Reisman conducted a 30-min. telecon to debrief the STS-123 (1J/A) crew on their EVAs in preparation for upcoming extravehicular activities.

ATV1 Performance Update: A planned refueling leak check on the ATV "Jules Verne" was completed nominally. Data from an erratic helium sensor in the oxidizer refueling system have been discarded without further impact. The pre-reboost firing test used 91 kg of fuel to achieve 0.98 m/s delta-V, exactly as predicted. However, 145 kg of attitude control prop was used by the RCS (reaction control system); it is under scrutiny.

ATV1 Reboost Update: Tonight's ISS reboost by the ATV is scheduled for a TIG (Time of Ignition) of 12:22am EDT, to yield an expected delta-V of 2.65 m/s. ISS attitude control authority will be handed over to RS MCS (Motion Control System) at 11:15pm for the subsequent maneuver to reboost attitude at 11:20pm. After the burn, the station is slewed back to TEA (Torque Equilibrium Attitude) and returned to US Momentum Management at ~1:25am.

FE-1 Email Update: Efforts are underway at MCC-H/Astronaut Office to enable emails from Kononenko's spouse Tatiana to get to Oleg.

CWC Update: A new updated CWC (Contingency Water Container) "cue card" was uplinked for the crew's reference. *[The new card (17-0002A) lists 38 CWCs (~1595.6 L total) for the four types of water identified on board: technical water (853.8 L, for Elektron, flushing, hygiene), potable water (647.2 L), condensate water (88.8 L), waste/EMU dump and other (5.8 L). Of the 38 containers, 15 CWCs with technical water (672.6 L) and 4 CWCs with potable water (176.3 L) must be cleared for* Wautersia *bacteria by MCC-H before use.]*

COL Update: The first part of the paced troubleshooting sequence on the FSL (Fluid Science Laboratory) by Reisman yesterday was successful. The laser switch in FSL was recovered, and all three drawers are operating fine; additional troubleshooting is scheduled next week (4/29 & 4/30).

SRVK-2M Update: After the RS SRVK condensate water processor twice shut down with indications of membrane overfill after yesterday's BKO multifiltration unit R&R, the crew demated and remated the connector. The systems are now operating nominally.

CEO photo targets uplinked for today were **Tianjin, China** *(the city of Tianjin with a population of more than 10 million, is Beijing's port on the Bohai Gulf. Looking just left of track),* **Yellow River Delta, China** *(the delta changes rapidly and should be undergoing heavy sedimentation during the present spring thaw. Looking nadir and*

left to map the margins), **Urumqi, China** *(this city is the focus of China's hydrocarbon exploration effort in its far west. Looking left at the foot of the mountains),* **Dunde Ice Cap, China** *(ice caps in central Asia are of increasing interest to climate change scientists. The Dunde has been cored in three places [cores about 140 m long] to the bedrock base. The cores go back to the last glacial ~20,000 years ago, and show an enormous increase in dust concentrations from that windier, drier period. Researchers also record a strong warming trend in the last ten years on Tibetan glaciers. Requested were general views of the ice cap looking left of track),* and **Ganges River Delta** *(a mapping swath of overlapping images is requested at nadir or just left of track, to document change in the waterways and coastline of the delta).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:29am EDT [= epoch]):*
Mean altitude -- 338.2 km
Apogee height -- 341.0 km
Perigee height -- 335.4 km
Period -- 91.30 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0004114
Solar Beta Angle -- -38.0 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 116 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 54005

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/07/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)

10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/23/08
Date:	Wednesday, April 23, 2008 1:44:39 PM
Attachments:	

ISS On-Orbit Status 04/23/08

All ISS systems continue to function nominally, except those noted previously or below.

Before breakfast, CDR Volkov, FE-1 Kononenko and FE-2 Reisman began their workday with the periodic session of the Russian biomedical routine assessments PZEh-MO-7/Calf Volume Measurement and PZEh-MO-8/Body Mass Measurement (first for CDR & FE-1, second for FE-2), using the IM mass measurement device which Oleg Kononenko afterwards broke down for stowage. *[Calf measurements (left leg only) are taken with the IZOG device, a custom-sewn fabric cuff that fits over the calf, using the knee and lower foot as fixed reference pints, to provide a rough index of deconditioning in zero-G and effectiveness of countermeasures. For determining body mass in zero-G, where things are weightless but not massless, the Russian IM "scales" measure the inertial forces that arise during the oscillatory motion of a mass driven by two helical metering springs with known spring constants. By measuring the time period of each oscillation of the unknown mass (the crewmember) and comparing it to the period of a known mass, the crewmember's mass is calculated by the computer and displayed.]*

Sergei Volkov set up the hardware for the Russian MBI-21 PNEVMOKARD experiment and conducted the session, his first (which forbids moving or talking during data recording). The experiment is controlled from the RSE-Med A31p laptop, equipped with new software, and uses the TENZOPLUS sphygmomanometer to measure arterial blood pressure. *[PNEVMOKARD (Pneumocard) is an attempt to obtain new scientific information to refine the understanding about the mechanisms used by the cardiorespiratory system and the whole body organism to spaceflight conditions. By recording (on PCMCIA cards) the crewmember's electrocardiogram, impedance cardiogram, low-frequency phonocardiogram (seismocardiogram), pneumotachogram (using nose temperature sensors), and finger photoplethismogram, the experiment supports integrated studies of (1) the cardiovascular system and its adaptation mechanisms in various phases of a long-duration mission, (2) the synchronization of heart activity and*

breathing factors, as well as the cardiorespiratory system control processes based on the variability rate of physiological parameters, and (3) the interconnection between the cardiorespiratory system during a long-duration mission and the tolerance of orthostatic & physical activities at the beginning of readaptation for predicting possible reactions of the crewmembers organism during the their return to ground.]

In the US Lab, FE-2 Reisman continued the evacuation sequence of the CSLM-2 (Coarsening in Solid-Liquid Mixtures 2) experiment in preparation for its ops tomorrow, which involved a series of vacuum draws on the sample chamber. *[After configuring the MSG (Microgravity Science Glovebox) facility, Garrett closed vacuum vent valves, checked for acceptable humidity levels in the sample chamber, and opened the SPU (Sample Processing Unit) water valve to initiate unattended vacuum prep. Later, he opened the vent & vacuum valves to initiate a vacuum draw on the sample chamber. CSLM-2 examines the kinetics of competitive particle growth within a liquid matrix. During this process, small particles shrink by losing atoms to larger particles, causing the larger particles to grow (coarsen) within a liquid lead/tin matrix. This study defined the mechanisms and rates of coarsening that govern the manufacture with metals from turbine blades to dental amalgam fillings.]*

The CDR performed a major 1.5-hour IFM (in-flight maintenance) in the Service Module (SM) by removing one of the module's eight 800A storage batteries (#2) and replacing it with a spare Blok 800A. The removed unit was prepared for disposal on the next Progress, M-64/29P. *[The ZRU charge/discharge unit #2 was deactivated by TsUP/Moscow beforehand and later reactivated. The new battery #2 is currently being conditioned in Cycle mode. This restores the full set of eight SM batteries to operation.]*

Meanwhile, the FE-1 also conducted routine IFM (in-flight maintenance) on the SRVK-2M condensate water processor, removing its multifiltration unit (BKO), which has reached its service life limit. The old BKO was replaced with a new unit and stowed for deorbiting on Progress 29P. *[BKO contains five purification columns to rid the condensate of dissolved mineral and organic impurities. It has a service lifetime of ~450 liters throughput. The water needs to be purified for proper electrolysis in the Elektron O_2 generator.]*

In the COL (Columbus Orbital Laboratory), FE-2 Reisman began the first part of the paced troubleshooting sequence on the FSL (Fluid Science Laboratory). Today's tasks consisted of removal (later re-install) of the gap protector cover, followed by checkout of the FCE (Facility Core Element) drawers for correct seating to verify proper functioning of the laser safety switches in the rear part, and closure of a front

panel switch. *[Tomorrow, troubleshooting will focus on ODM (Optical Diagnostic Module) Laser Switch Verification and ODM/CEM (Central Experiment Module) functions, including telemetry, to verify the ODM laser switches integrity ODM & CEM functionalities. On 4/29, Reisman will support a software upgrading of the RIC (Rack Interface Controller) and VMU (Video Management Unit). followed on 4/30 by the long-overdue LAN (Local Area Network) cable repair with an uploaded repair kit and a temporary repair of the MIL BUS A connector, followed by a ground-only repair checkout and minimum system/subsystem checkout. If these activities are successful, Reisman will support the ground, after 5/5, in conducting Optical Checkout #1, Optical Target exchange, Procedure walkthrough, Optical Checkout #2, GEOFLOW EC (Experiment Container) insertion, another Procedure walkthrough, GEOFLOW check-out, and GEOFLOW science start.]*

Garrett also conducted the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week. The current cue card (17-0002) lists 38 CWCs (~1519.7 L total) for the four types of water identified on board: technical water (801.7 L, for Elektron, flushing, hygiene), potable water (647.2 L), condensate water (65 L), waste/EMU dump and other (5.8 L). Of the 38 containers, 15 CWCs with technical water (620.5 L) cannot be used until cleared for* Wautersia *bacteria, and 4 CWCs with potable water (176.3 L) are not cleared for use pending analysis of samples returned on 1J/A.]*

Volkov & Kononenko completed a 2-hr outfitting job by removing the old curtain in front of the ASU toilet facility in the SM and replacing it with a new curtain, delivered on Progress M-63/28P. The activity was supported by ground specialist tagup from TsUP-Korolev.

The FE-1 completed the periodic (about twice a month) replenishing of the Elektron oxygen generator's water supply for electrolysis, filling the KOV EDV container with water collected in CWC (Contingency Water Container) #1035 from the Lab CCAA (Common Cabin Air Assembly) dehumidifier. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron shutdown.]*

Kononenko conducted the daily routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

As part of the ECLSS servicing, Oleg also performed the periodic check of the function of the IP-1 airflow sensors in the various Russian segment (RS) hatchways. *[The inspection includes the passageways PrK (SM Transfer*

Compartment)–ATV, PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1.]

Volkov completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The FE-2 configured the video equipment in the SM for filming all crewmembers’ subsequent workout on the RED resistive exerciser in Node-1, for biomechanical assessment of the hardware status by ground engineers. *[The camcorder equipment is being left in place until all crewmember’s RED sessions are captured. The first video was recorded via VTR (Video Tape Recorder) from the ground.]*

Afterwards, the crew completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDRFE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

Later, Sergei downloaded the crew’s exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Oleg unstowed and installed the equipment for the periodic Russian PZE-MO-10 "Hematokrit" testing that is scheduled for him tomorrow. *[MO-10 measures the hematocrit (red blood cell mass) value of the blood (it is a well-known phenomenon of space flight that red blood cell mass {normal range: 30-45%} tends to go down over time).]*

Volkov & Kononenko again had the regular 60 minutes for themselves for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residency.

At ~5:20am EDT, Oleg & Sergei powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, and power supply) and at 5:25am conducted a ham radio exchange with students at the P.I. Klimuk School No. 4 in Shchelkovo, Russia, with Cosmonaut Yurchikhin in attendance. *[Questions were uplinked beforehand. “Did you dream to become a cosmonaut?”; “What is your attitude to female-cosmonauts?”; “Do you perform space walks? What are your sensations?”; “How do you spend your leisure time in space?”; “What does it take now to become a cosmonaut?”; “How does a cosmonaut feel after landing?”; “Who do you want to be like in your life?”; “Are you*

a happy person?"; "Would you like for your child also to be a cosmonaut?"; "We are aware that Sergei is a graduate of V. M. Komarov School in Star City. What kind of school memories to you have? Do you remember your teachers?"]

At ~2:40pm EDT, Garrett Reisman is scheduled for his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on an SSC laptop).

As a voluntary item on the "job jar" task list, Reisman was to retrieve an ITCS (Internal Thermal Control System) sample return Ziplock bag containing two ITCS coolant samples from the Lab1S5 Rack front and restow it in a CTB (Cargo Transfer Bag) with trashed items.

ATV Closet Ops: An updated unpacking list was uplinked yesterday to support future unloading of ATV-1 "Jules Verne". An ATV is not unpacked the same way as a Progress. Serving more like a storage shed, items are removed as they are needed for activities. This is referred to as "closet ops". An item will be unloaded at the time when it is needed, and there is no specific unpack time scheduled on the crew's timeline as for Progress or MPLM (Multi-Purpose Logistics Module). This alleviates storage requirements, always a critical issue on ISS.

CEO photo targets uplinked for today were **Eastern Tien Shan Mountains, China** *(ice caps on this central Asian mountain range are the object of interest. Requested were general views right of track as ISS passed parallel to the range),* **Lake Nasser, Toshka Lakes, Egypt** *(views just left of track captured the new Toshka lakes and then the shoreline of Lake Nasser. Shoreline views to show water levels were requested. Water levels have been declining for the last three years after many years of rising),* and **Barringer Impact Crater, Arizona** *(this small crater [1 km diameter], better known as Arizona's Meteorite Impact crater, is pristine, being only ~50,000 years old. As ISS flew over the Grand Canyon, the crew was to look right of track on the edge of the great forested area known as the Mogollon Rim, with nearby lava-capped hills being a local visual cue).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:35am EDT [= epoch]):*
Mean altitude -- 338.3 km
Apogee height -- 340.9 km
Perigee height -- 335.8 km
Period -- 91.30 min.
Inclination (to Equator) -- 51.64 deg

Eccentricity -- 0.0003817
Solar Beta Angle -- -38.8 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 111 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53990

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/07/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/22/08
Date:	Tuesday, April 22, 2008 4:13:04 PM
Attachments:	

ISS On-Orbit Status 04/22/08

All ISS systems continue to function nominally, except those noted previously or below.

FE-1 Kononenko performed major periodic replacements on the SM(Service Module)'s ASU toilet facility, changing out replaceable parts with new components, such as a sensor unit (A8A-9060), two receptacles (PR & MP), four hoses, a T-connector, an elbow fitting, an indicator, a filter insert (F-V), and the pretreat container (E-K) with its hose. All old parts were discarded as trash. The KTO waste container is being kept for ~7 days. The activity was supported by ground specialist tagup. *[E-K contains five liters of pre-treat solution, i.e., a mix of H_2SO_4 (sulfuric acid), CrO_3 (chromium oxide, for oxidation and purple color), and H_2O (water). The pre-treat liquid is mixed with water in a dispenser (DKiV) and used for toilet flushing.]*

In the US Lab, after inspecting, activating & configuring the MSG (Microgravity Science Glovebox) facility, FE-2 Reisman initiated a new series of vacuum draws on the sample chamber by opening the vent and vacuum valves in preparation for CSLM-2 (Coarsening in Solid-Liquid Mixtures 2) experiment ops on 4/24. After configuring the EMCS for water reservoir replacement, Reisman then replaced the water reservoirs on both rotors and set EMCS switches to allow ground commanding of the facility. The setup was photo documented. *[CSLM-2 examines the kinetics of competitive particle growth within a liquid matrix. During this process, small particles shrink by losing atoms to larger particles, causing the larger particles to grow (coarsen) within a liquid lead/tin matrix. This study defined the mechanisms and rates of coarsening that govern the manufacture with metals from turbine blades to dental amalgam fillings.]*

Starting a new round of preventive ventilation system maintenance in the Russian Segment (RS), CDR Volkov cleaned Group A, B & C fan screens in the SM and

inspected equipment & structural elements in the maintenance areas to check for residue & condensate, taking photographs of the latter if found, for subsequent downlink.

Garrett Reisman performed the periodic offloading of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1062) with the collected water slated for processing. No samples were required this time. *[Estimated offload time before reaching the tank's neutral point (leaving ~6 kg in the tank): ~25 min.]*

Garrett also deactivated and safed the US OGS (Oxygen Generation System). Next activation is tentatively planned after the 1J flight, sometime in mid-June. *[Activities included deactivation of the WDS (Water Delivery System), accessing the OGS rack front and demating the O_2 outlet QD (Quick Disconnect) at the LAB1PD1 panel, then performing an O_2 purge of the H_2 (hydrogen) sensor, retrieving the WW (Waste Water) plug for disconnecting the WW jumper and reinstalling the WDS on the OGS rack front.]*

Sergei Volkov unstowed the RSK2 A31p laptop used by So-Yeon Yi and installed it (with Velcro) in the SM (panel 418) for use with the Kenwood amateur/ham radio station, which he connected and later tested with the laptop in a health check.

Kononenko conducted the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems (see also above for replacement maintenance). *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV at the SKV-2 air conditioner for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Working off the Russian discretionary "time permitting" task list, the CDR & FE-1 updated/edited the IMS (Inventory Management System)'s standard "delta file", including locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

In continued support of the Japanese CW/RW (Cell Wall/Resist Wall) experiment in the MSG EMCS (Microgravity Science Glovebox/European Modular Cultivation System), which has been having problems with insufficient hydration, Garrett Reisman's attention today focused on the Water Reservoirs, which he replaced with new ones on both rotors. *[CW/RW operates in the EMCS facility in eight special ECs (Experiment Containers) which Garrett recently (3/30) installed on the*

centrifuges of the facility. The EMCS rack contains two rotating centrifuges, Rotor A & Rotor B that can support a wide range of small plant & animal experiments under partial gravity conditions.]

Later, the FE-2 spent ~30 min reviewing an uplinked forward plan for troubleshooting the failed science experiments in the COL (Columbus Orbital Laboratory). *[Starting tomorrow (4/23), Garrett will check the FCE (Facility Core Element) drawers for correct seating to verify proper functioning of the laser safety switches in the rear part and closure of a front panel switch. On 4/24, troubleshooting will focus on ODM (Optical Diagnostic Module) Laser Switch Verification and ODM/CEM (Central Experiment Module) functions, including telemetry, to verify the ODM laser switches integrity ODM & CEM functionalities. On 4/29, Reisman will support a software upgrading of the RIC (Rack Interface Controller) and VMU (Video Management Unit). followed on 4/30 by the long-overdue LAN (Local Area Network) cable repair with an uploaded repair kit and a temporary repair of the MIL BUS A connector, followed by a ground-only repair checkout and minimum system/subsystem checkout. If these activities are successful, Reisman will support the ground, after 5/5, in conducting Optical Checkout #1, Optical Target exchange, Procedure walkthrough, Optical Checkout #2, GEOFLOW EC (Experiment Container) insertion, another Procedure walkthrough, GEOFLOW check-out, and GEOFLOW science start.]*

Oleg used the Russian BAR-RM Thermohygrometer instrument (Iva-6A *)* to take air temperature measurements at the VPrK inlet fan of the SM Transfer Compartment.

The FE-2 performed a tape exchange on both VDS VTRs (Video Distribution System/Video Tape Recorders), VTR1 & VTR2. The old tapes were stowed for later return to Houston.

Garrett also downloaded the IWIS (Internal Wireless Instrumentation System) structural dynamics data taken during Soyuz 15S departure and ATV1 reboost to an SSC (Station Support Computer) for subsequent downlink to the ground.

At ~10:40am EDT, Garrett Reisman downlinked two televised PAO messages of greetings, one for use at NASA Visitors Centers around the US, the other for replay at the Academy of Arts & Sciences 40th anniversary screening of the Stanley Kubrick/Arthur C. Clarke film “2001: A Space Odyssey” on 4/25, at a second screening of this film at the Smithsonian Folklife Festival at the mall in Washington, D.C., and possibly also at its screening at the Tribeca Film Festival.

The three crewmembers had their standard PMC (Private Medical Conference) today.

The crew also completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

Afterwards, Garrett downloaded the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Sergei & Oleg had the regular 60 minutes for themselves for general orientation (station familiarization & acclimatization) as is standard daily rule for fresh crewmembers for the first two weeks after starting station residency.

VolSci Program Update: For the Voluntary Science program on 4/26 (Saturday) or 4/27 (Sunday), Garrett Reisman was offered two options for his choice: (1) SLAMMD (Space Linear Acceleration Mass Measurement - Body Mass Measurement), or (2) EPO(Education Payload Operations) Careers Demo (Identify all the different steps crewmembers have taken to get to where they are today; identify all the different NASA careers that work together to prepare an astronaut for spaceflight. Objective: to motivate students to strive for a career in science, technology, engineering, and mathematics and to someday work for NASA).]

CEO photo targets uplinked for today were **Central Asia dust event** *(Dynamic event. A major dust event is taking place in the Takla Makan Desert of western China. This desert basin is often much hazier than surrounding areas due to blowing dust. The crew was to include the mountainous margins of the basin so that we can gauge the altitude of the top of dusty airmass. The Takla Makan is one of the dustiest places on Earth, with its dust frequently falling on Beijing and Japan. Looking right of track, for three minutes)* and **Nile River delta, Egypt** *(looking right of track for general views of the delta region. These images will be used to pinpoint future targets)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:04am EDT [= epoch]):*
Mean altitude -- 338.4 km
Apogee height -- 341.2 km
Perigee height -- 335.7 km
Period -- 91.30 min.

Inclination (to Equator) -- 51.63 deg
Eccentricity -- 0.0004093
Solar Beta Angle -- -39.0 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 76 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53974

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/07/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
2QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
3QTR CY09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3/Discovery - ELC1, ELC2
4QTR CY09 -- STS-130/20A/Endeavour – Node-3 + Cupola
1QTR CY10 -- STS-131/19A/Atlantis - MPLM(P)
1QTR CY10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)

2QTR CY10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/21/08
Date:	Monday, April 21, 2008 9:07:29 PM
Attachments:	

ISS On-Orbit Status 04/21/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 1 of Increment 17 (with CDR Sergei Volkov, FE-1 Oleg Kononenko, FE-2 Garrett Reisman).*

The crew enjoyed a full rest day.

Having passed Day 30 of his flight, FE-2 Reisman ended his latest session with the NASA/JSC experiment NUTRITION w/Repository by collecting a final urine sample upon wakeup for storage in the MELFI (Minus-Eighty Laboratory Freezer for ISS). The sampling kit was then stowed away. *[The current NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R +30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

In the JLP (Japanese Experiment Module Experiment Logistics Module Pressurized Section), Garrett Reisman performed the periodic checkup on JLP status and shell temperatures by using the MKAM (Minimum Keep Alive Monitor), then called down the results of the temperature check via S-band.

CDR Volkov conducted the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including ASU toilet facilities systems/replaceables.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS

treadmill (CDR, FE-1, FE-2), RED resistive exercise device (FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

Afterwards, Garrett downloaded the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~1:45pm EDT, FE-2 Reisman powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, and power supply) and at 1:50pm conducted a ham radio exchange with children at the Arnold Palmer Hospital for Children in Orlando, Florida. *[Arnold Palmer Hospital for Children in Orlando, Florida, is one of 8 hospitals under the Orlando Regional Healthcare umbrella and addresses the unique medical needs of children in the Central Florida area, including a level one trauma center. The children who participated in this contact are patients at the hospital. It was an exciting surprise and enriching experience that made their hospital stay a memorable event. Questions to Garrett were uplinked beforehand. "What kind of food do you eat, and is it good?"; "How long can you stay out on a spacewalk?"; "What experiments are you doing in space?"; "What duties are yours on the Space Station?"; "How do you communicate with your family?"; "What do you do if you get sick in space?"; "What can you see on Earth from Space?"; "How long will the Space Station last?"; "What skills do I need to be an astronaut?"; "What is your favorite thing to do on the Space Station?"]*

ATV Reboost Test: The single-burn reboost firing test of the ATV "Jules Verne" overnight at 12:10am-1:52am was conducted successfully. Burn duration was 4m 33s, with a delta-V of 1.04 m/s (3.41 ft/sec). Mean altitude gain was ~1.49 km. The purpose of the reboost was to test the ATV main engines prior to the scheduled reboost on 4/25 (Friday). ISS attitude control authority was handed over to the Russian MCS (Motion Control System) thrusters at ~12:00am and returned to US momentum management at ~2:47am.

CEO photo target uplinked for today was **Central Asia dust event** *(Dynamic event. A major dust event is taking place in the Takla Mayan Desert of western China. This desert basin is often much hazier than surrounding areas due to blowing dust. Images were to include the mountainous margins of the basin so that researchers can gauge the altitude of the top of dusty air mass. The Takla Mayan is one of the dustiest places on Earth, with its dust frequently falling on Beijing and Japan).*

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the

Earth from space, with 314,000 from the ISS alone).

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
04/25/08 -- ATV-1 “Jules Verne” reboost
05/07/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- NASA 50 Years
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- ISS 10 Years
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
04/23/09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/16/09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- Six-person crew on ISS (following Soyuz 18S-2 docking)
09/03/09 -- STS-129/ULF3/Discovery - ELC1, ELC2
10/22/09 -- STS-130/20A/Endeavour – Node-3 + Cupola
01/21/10 -- STS-131/19A/Atlantis - MPLM(P)
03/18/10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
04/29/10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/20/08
Date:	Sunday, April 20, 2008 2:12:24 PM
Attachments:	

ISS On-Orbit Status 04/20/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday. Week 1 of Increment 17 (with CDR Sergei Volkov, FE-1 Oleg Kononenko, FE-2 Garrett Reisman).*

Crew wake/sleep cycle has "normalized", Today's wakeup - 2:00am, sleeptime – 5:30pm EDT.

First activity this morning for FE-2 Reisman was to start on his FD30 (Flight Day 30) session with the NASA/JSC experiment NUTRITION w/Repository. Reisman completed the all-day session, collecting urine samples for 24 hrs (to continue through tomorrow morning) and blood samples (for Serum & Heparin). *[Garrett performed self-phlebotomy, i.e., drew his blood samples (from an arm vein) which were first allowed to coagulate in the Repository, then spun in the HRF2 RC (Human Research Facility 2/Refrigerated Centrifuge) and finally placed in MELFI (Minus-Eighty Laboratory Freezer for ISS). The RC was later powered off after a temperature reset to limit wear on the compressor, and cleaned. Background: NUTRITION is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight; this includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes. The Clinical Nutritional Assessment profile currently required on all U.S. Astronauts collects blood and urine samples preflight and postflight. NUTRITION expands this protocol by also capturing in-flight samples and an additional postflight sample. Furthermore, additional measurements are included for samples from all sessions, including additional markers of bone metabolism, vitamin status, and hormone and oxidative stressor tests. The results will be used to better understand the impact of countermeasures (exercise and pharmaceuticals) on nutritional status and nutrient requirements. The Clinical Nutritional Assessment profile (MR016L), first started on two Mir crewmembers and then on all ISS US crews, nominally consists of two pre-flight and one post-flight analysis of nutritional status, as well as an in-flight assessment of dietary intake using the FFQ (Food*

Frequency Questionnaire). The current NUTRITION project has expanded MR016L testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]

Later, the FE-2 worked in the JLP (Japanese Experiment Module Experiment Logistics Module Pressurized Section), performing the periodical status and shell temperature check from the MKAM (Minimum Keep-Alive Monitor) and calling down the temperatures via S-band.

CDR Volkov conducted the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including ASU toilet facilities systems/replaceables and the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV at the SKV-2 air conditioner for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Sergei also gathered weekly data on total operating time & “On” durations of the Russian POTOK-150MK (150 micron) air filter unit of the SM’s SOGS air revitalization subsystem for reporting to TsUP.

At ~8:05am EDT, the crewmembers held their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP/Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (FE-2) and VELO bike with bungee cord load trainer (CDR, FE-1).

Afterwards, Garrett downloaded the crew’s exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

All three crewmembers had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked

ground video on an SSC laptop), Sergei at 7:00am, Oleg at 8:30am, Garrett at 11:35am.

ATV Reboost Test: A single-burn reboost test of the ATV "Jules Verne" is scheduled for tonight at 12:10am-1:52am. ISS attitude control authority will be handed over to the Russian MCS (Motion Control System) thrusters at ~12:00am and returns to US momentum management at ~2:47am.

Weekly Science Update *(Expedition Sixteen -- Week 26)*

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Completed. Instrument was relocated to FGB for Inc17 measurements (as Russian experiment) and ALTCRISS was re-activated on 4/8. Increment 16 passive dosimeters and memory cards were returned on 15S.

ANITA: Completed.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): In progress.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): The CSLM-2 SPU #4 completed the vacuum vent cycles, and started the sample 10-hour heat soak, at the end of 10 hours the quench was successfully completed. The SPU #4 temperature data was reviewed and preliminary results show a nominal run.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Experiment data were returned on 15S.

EuTEF (European Technology Exposure Facility): EuTEF platform is nominal. DEBIE-2: Link error still under investigation; DOSTEL: On-going science acquisition; EuTEMP: Currently inactive as planned; EVC: So far further troubleshooting is required, as the high-resolution downlinked images are very difficult to interpret. The impact of MISSE-6 on the EVC field of view is apparently much bigger than anticipated; EXPOSE: On-going science acquisition; FIPEX: Short-duration measurements with sensors RAM1, RAM4 and ZENITH8 continue. Long-term measurements can not be started due to RS422 Link Error – Troubleshooting on-going; MEDET: On-going science acquisition, running nominal, except sample wheel of the Spectrometer is blocked on "park" position; PLEGPAY: During the SOLACES instrument operation, some countermeasure Xenon gas release was implemented (nominal procedure). Analysis on-going to assess if we can relax this countermeasure procedure. Next test (Langmuir Probe acquisitions) via direct commanding will take place during the 15S undocking; TRIBOLAB: on 4/10 the instrument was commanded in Thermal Stabilisation mode in preparation of the first experiment run. On 4/11, the first TRIBOLAB Pin On Disk (POD1) was started and ran until 15S undock. The experiment was paused during the 15S thruster firing on 4/14, and resumed successfully. On 4/15, the Pin On Disk (POD1) run was suddenly stopped after we encountered much higher than anticipated friction coefficients measurements. Analysis on-going.

Fluid Science Laboratory (FSL): The FSL Facility awaits further troubleshooting after 1J/A departure.

GEOFLOW: Deferred. Start of GEOFLOW is pending further FSL troubleshooting/ commissioning activities.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Second session for Yuri Malenchenko has been nominally performed between 4/12 and 4/15. Blood and urine samples were returned on 15S.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Complete.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION/REPOSITORY: In progress.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Last crew sampling session for Inc16 FE-1 Malenchenko was successfully performed on 4/7. Samples were downloaded on 15S.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): In progress.

SOLAR (Solar Monitoring Observatory): On 4/12, the tracking mode software was successfully patched. First results are promising, but require further assessment. SOLAR platform went to stand-by mode during Sun tracking measurements. The Sun observation is now closed (Beta angles higher than 22deg), and will resume on 4/30. SOVIM: Science data acquisition has been performed nominally until closing of Sun observation window (4/15); SOLSPEC: One spectrum measurement has been successfully performed on 4/13 and will help to cross-compare the results gathered with Sun instrument on NASA Sounding Rocket launched on 4/14/16:58GMT; SOLACES: Two spectrum measurements have been successfully performed on 4/13 and will help to cross-compare the results gathered with Sun instrument on NASA Sounding Rocket launched on 4/14/16:58GMT.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): Planned.

CEO (Crew Earth Observation): Through 4/15 the ground has received a total of 18,267 ISS CEO images for review and cataloging. Late this week imagery received included sessions with camera times corresponding to the following daily target requests: Pilcomayo River dynamics, N. Argentina; Lima, Peru; East Venezuelan land use; Irrawaddy River Delta, Burma; Chongqing, China; Luquillo Forest, Puerto Rico; Santa Barbara Coast, California; Eastern Tien Shan Mountains, China; and Slate Islands Impact Crater, Lake Superior. We will be providing feedback on these acquisitions as we work through them in the coming week. Feedback on last week's acquisitions includes: Teide Volcano, Canary Islands – first review indicates more clouds present then we had hoped; Volcán Colima, Mexico – again clouds prevented a good acquisition; imagery for other acquisitions are still under review. "Your recent striking image of the Cananea Copper Mine, Sonora-Mexico will be published on NASA/GSFC's Earth Observatory site this weekend. Your photo beautifully illustrates the land use and ecological impacts one of the world's largest open-pit copper mines. Thanks for spotting this one. We are very pleased with the quality of your imagery and your high level of response to our target requests. Please don't hesitate to ask if we can provide additional products or assistance in acquiring our science targets."

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with

ISS Orbit (as of this morning, 8:52am EDT [= epoch]):
Mean altitude -- 336.9 km
Apogee height -- 337.9 km
Perigee height -- 336.0 km
Period -- 91.28 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0001405
Solar Beta Angle -- -37.6 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 146 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53943

Significant Events Ahead *(all dates Eastern Time, some changes possible)*:
05/07/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port) *[pending 15S landing anomaly analysis]*
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- NASA 50 Years
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- ISS 10 Years
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
04/23/09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/16/09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- Six-person crew on ISS (following Soyuz 18S-2 docking)
09/03/09 -- STS-129/ULF3/Discovery - ELC1, ELC2
10/22/09 -- STS-130/20A/Endeavour – Node-3 + Cupola
01/21/10 -- STS-131/19A/Atlantis - MPLM(P)
03/18/10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
04/29/10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/19/08
Date:	Saturday, April 19, 2008 5:36:20 PM
Attachments:	image002.gif

ISS On-Orbit Status 04/19/08

All ISS systems continue to function nominally, except those noted previously or below. *Day 192 in space for Peggy & Yuri (190 days onboard ISS). Expedition 17 Crew: CDR Sergei Volkov, FE-1 Oleg Kononenko, FE-2 Garrett Reisman.*

Yest posadka! *(We have Landing!)* Welcome back home, Yuri Malenchenko, Peggy Whitson and So-Yeon Yi! After 192 days in space (190 docked to ISS), Soyuz TMA-11/15S, carrying two-thirds of the Expedition 16 crew plus the South-Korean SFP, **landed successfully** this morning at ~4:30am EDT in the steppes of Kazakhstan, with the crew in excellent condition**.** The landing in Kazakhstan was approximately 450 km west of the prime landing area in the "ballistic mode" zone. *[The 15S undocking sequence was initiated on 4/19 with the command to open the Soyuz hooks at 1:03 am EDT. 15S separated from ISS at 1:06 am using the docking system springs. Three minutes after initial separation an automatic separation burn was performed by the Soyuz vehicle. A 4 min 18 sec de-orbit burn was initiated at 3:40 am EDT. During descent, the 15S vehicle guidance system down-moded to a ballistic entry mode. The satisfactory condition of the crew was confirmed by 15S CDR Yuri Malenchenko when he made contact with TsUP-Moscow via the 15S Iridium satellite phone. Russian SAR (Search & Rescue) helicopters from the ballistic staging area, including a NASA crew surgeon, reached the crew approximately 30 minutes after landing, and reported the crew to be in good health. The crew was transported to Kustenai, Kazakhstan via helicopter and departed for Star City, arriving at approximately 1:00pm EDT, where they were received by a welcoming NASA delegation headed by Christopher Scolese, Michael*

Ryschkewitsch, and William Gerstenmaier. Post-flight analysis of data from the descent module systems will be conducted after the module is returned to Moscow.]

After the long undock workday (12:30pm yesterday – 4:45am this morning), the remaining ISS crew is enjoying a really long (21-hr) sleep period, from 4:45am – 2:00am tomorrow morning. Beginning on Sunday, 4/20, the station sleep/wake cycle is then back on the standard 2:00am-5:30pm EDT.

Preparations for the early undocking began late last night, with the returning crew ingressing the Soyuz Descent Module and FE-1 Malenchenko performing the regular communications check from the TMA-11 at ~6:30pm EDT.

Yuri & Peggy then activated the spacecraft (~10:00pm), followed by Sergei Volkov & Oleg Kononenko closing the Soyuz and FGB hatches, and the departing Soyuz crew started the standard one-hour leak check on the Soyus-to-FGB vestibule.

The video recording of the earlier Change of Command ceremony was downlinked by FE-2 Reisman at 10:20pm.

Garrett also deactivated the onboard amateur radio stations in the Service Module (SM) and FGB to prevent radio interference with the departing spacecraft.

At 11:30-11:45pm, the ISS went in free drift for FGB hooks opening.

During that time (~11:30pm), Reisman assembled, configured and activated the U. S. EarthKAM (EK) hardware for a new session, for the first time in Node-2, the 28th time aboard the ISS and the first time on Increment 17). The reason for moving EK to the Node-2 nadir hatch window is that the Lab science window still needs to be shuttered to protect it against outgassing from the SPDM (Special Purpose Dexterous Manipulator) Dextre. *[For focusing the camera, Garrett had to see the ground. EK is using a DCS 760 electronic still camera with 50mm (f/1.4) lens at the Node-2 window, powered by 16Vdc from a 28 Vdc adapter, taking pictures by remote operation from the ground, without crew interaction. Numerous schools are participating in this EarthKAM session. EarthKAM is an education program that enables thousands of students to photograph and examine Earth from the unique perspective of space, integrating the excitement of ISS with middle-school education. The student requests are uplinked in a camera control file to an A31p SSC (Station Support Computer) laptop which then activates the camera at specified times and receives the digital images from the camera's storage card on its hard drive, for subsequent downlink via OPS LAN.]*

ISS attitude control was again switched to free drift at 1:01am this morning, followed

shortly by the Soyuz undocking.

Prior to starting their sleep period at 4:45am, the remaining ISS crew completed a number of post-undocking tasks:

With the U.S. CDRA (Carbon Dioxide Removal Assembly) deactivated by the ground early this morning (~3:00am-8:00am) and its cooling no longer required, FE-2 Reisman demated and took down the ITCS LTL (Internal Thermal Control System/ Low Temperature Loop) jumper at the CDRA-supporting LAB1D6 rack.

Garrett also set up the hardware associated with urine and blood collections for his second session of NASA's NUTRITION w/Repository experiment in the Lab, scheduled on his timeline tomorrow and requiring Garrett to start his mandatory 8-hr fasting tonight for the blood draw (since he has a 21-hr sleep cycle on Sunday). The 24-hour urine sample collection starts with the first void Sunday morning and continues through the first void on Monday morning.

On the US voluntary "job jar" task list, activities for CDR Volkov and FE-2 Reisman included taking measurements for the regular atmospheric status check for ppCO_2 (pp Carbon Dioxide) in the Lab, SM (at panel 449) and COL (Columbus Orbital Laboratory), using the hand-held CDMK (CO_2 Monitoring Kit, #1002 & #1009), with the CDRA now turned off. Batteries were to be replaced if necessary.

Also added to the discretionary task list for Sergei & Garrett was the periodic torquing (tightening) of the male QDs (Quick Disconnects) gfound on the FSS (Fluid System Servicer) jumpers.

A third job in the "job jar" task lit, at the crew's convenience, is the periodic audit of rack locations, using the IMS (Inventory Management System). *[The audit function, introduced with the implementation of IMS software version 2.0, allows the crewmember to set up audits of bags, kits, containers and stowage locations on the laptop.]*

In a fourth suggested job item, the IMS audit feature is also to be used by the crew for an inventory of CTBs (Cargo Transfer Bags) shown as containing spare A31p laptop hardware (#1131), IWIS components (#1188), BP/ECG (Blood Pressure/ Electrocardiogram) equipment (#1003), water microbiology kit (#1001), and a jettison bag with EMCS hardware.

Kononenko conducted the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Volkov completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crewmembers completed their regular physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), and RED resistive exercise device (FE-2).

Afterwards, Garrett downloaded the crew’s exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

CEO photo targets uplinked for today (optional) were **Taal Volcano, Philippines** *(Taal volcano, one of the most active volcanoes in the Philippines, is easily recognized as an island in the 20-km long Taal caldera lake. The island is a complex volcano that has grown about 25% in area during historical time. Powerful pyroclastic flows and surges from historical eruptions from Taal have caused much destruction. The growth of satellite cities around Manila brings increasing numbers of people closer to the volcano),* **Manila, Philippines** *(looking right, between the ISS track and Taal Volcano. Crew was to shoot urban margins of greater Manila, home to more than 14 million people),* and **Chaing Mai, Thailand** *(looking left for this university city, the largest in northern Thailand. Asian cities tend to be earth-colored and thus harder to identify from orbit. Chang Mai lies in a light-toned valley. Valleys are intensively farmed so that little forest remains—allowing the north-south valleys to be more easily detected from orbit)*.

CEO photography can be studied at this “Gateway” website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
05/07/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port) *[pending 15S landing anomaly analysis]*
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)

08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
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10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
04/23/09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/16/09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
09/03/09 -- STS-129/ULF3/Discovery - ELC1, ELC2
10/22/09 -- STS-130/20A/Endeavour – Node-3 + Cupola
01/21/10 -- STS-131/19A/Atlantis - MPLM(P)
03/18/10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
04/29/10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/18/08
Date:	Friday, April 18, 2008 1:49:22 PM
Attachments:	

ISS On-Orbit Status 04/18/08

All ISS systems continue to function nominally, except those noted previously or below. *Day 9 of joint E16/E17 operations by CDR-16 Peggy Whitson, FE-1-16 Yuri Malenchenko, FE-2-17 Garrett Reisman, CDR-17 Sergei Volkov, FE-1-17 Oleg Kononenko and SFP/VC14 So-Yeon Yi. Day 191 in space for Peggy & Yuri.* Last day before Soyuz 15S undocking, with the ISS crew on an irregular wake/sleep cycle:

- Sleep: 1:00am – 12:30pm EDT;
- Wake-up: 12:30pm – 4:45am (4/19); E16 departs @ 1:06am
- Sleep time for E17: 4:45am – 2:00am (4/20)

The E16/E17 crew rotation/handover period is running down. Whitson, Volkov, Malenchenko and Kononenko are completing their joined crewtime for dedicated ("functional") CDR/CDR & FE/FE handover activities plus "generic" handovers where crewmembers are scheduled together to complete various designated standard tasks.

From the US voluntary "job jar" task list, after wakeup and before breakfast, FE-2 Reisman & SFP (Space Flight Participant) So-Yeon Yi again downloaded the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data from their Actiwatches to the HRF-1 (Human Research Facility 1) laptop. Yi has been participating in SLEEP for NASA under a Space Act agreement with South Korea. Later tonight, CDR Whitson will work with her own, Garrett's and So-Yeon's Actiwatch, downloading their accumulated data to the HRF-1 laptop, initializing her unit for FE-2 Reisman, then stowing the SLEEP hardware and powering down the HRF1 laptop. *[To monitor the crewmember's sleep/wake patterns and light exposure, crewmembers wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

For Peggy & Garrett, the second session with the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function) ended today with the CDR & FE-2 performing their final INTEGRATED IMMUNE blood and liquid saliva collection, assisting each other with the blood draw, photo-documented by Kononenko. The subjects' saliva return pouches and blood sleeves as well as the saliva collection kit were then stowed in the MELFI (Minus-Eighty Laboratory Freezer for ISS), which Reisman had prepared with ICEPACs before. *[IMMUNE assessment, integrated with the Russian IMMUNO, is a 24-hr. test of human immune system changes, with the objective to investigate immune neuro-endocrine reactions in the space environment by studying samples of saliva, blood and urine before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function, using collection kits and the biomedical (MBI) protection kit, to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected at intervals during the collection day using a specialized book that contains filter paper. The liquid saliva collections require that the crewmember soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations. For cold storage, samples are secured in the MELFI. Also included are entries in a fluid/ medications intact log, and a stress-test questionnaire to be filled out by the subject at begin and end. Urine is collected during a 24-hour period, conventionally divided into two twelve-hour phases: morning-evening and evening-morning.]*

FE-1 Malenchenko, with assistance by CDR-17 Volkov, prepared for his return to Earth by spending about two hours in the Soyuz with packing and stowing of equipment, after transferring BTKh-1,-2, & -4 (Glycoproteid, MIMETIK-K & VAKTsINA-K) sample hardware in the "Luch-2" kit, the "Konyugatsiya" (BTKh-10, Conjugation) experiment in the Recomb-T kit from CRYOGEM-03M, and INTERLEUKIN-K (BTKh-20) to TMA-11.

Also transferred for return were the Russian payload TkhN-9 SVS (Self-Propagating High-Temperature Synthesis) equipment, the Japanese GCF-JAXA Crystallization Facility, the Russian SAMPLE experiment, and other payload items, with transfers logged in the IMS (Inventory Management System).

SFP So-Yeon Yi meanwhile closed out and transferred her experiments KAP01 (Growth & mutation of plant seeds) and KAP03 (Development of Bioreactor for use on the ISS).

FE-2 Reisman set up, programmed and verified the IWIS (Internal Wireless Instrumentation System) with its RSUs (Remote Sensor Units) and NCU (Network

Control Unit) to record structural dynamics/vibrational data during the ISS free drift and Soyuz undocking periods. The departure will also be recorded by the external SDMS (Structural Dynamics Measurement System).

Garrett conducted the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Oleg Kononenko completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The remaining crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR-17, FE-17), and RED resistive exercise device (FE-2).

Afterwards, Garrett & Oleg downloaded the crew’s exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

As Whitson, Malenchenko and Yi prepare to ingress Soyuz TMA-11, CDR Volkov is scheduled (at ~8:55pm) to configure the onboard communications system (STTS) for the undocking, both working to set up, check and maintain the VHF comm link from the TMA-11 SA to TsUP/Moscow via RGS (Russian Ground Site) and the comm system for Soyuz undocking and descent.

Work hours for the crew continued into the next day (4/19) in support of the Soyuz undocking and post-undocking activities, with sleep time beginning at 4:45am EDT.

If everything is nominal, the return to Earth of the TMA-11 spacecraft tomorrow morning will proceed along the following approximate event sequence (all times EDT):

- ISS attitude control handover to RS --- 9:40pm (4/18);
- ISS in free drift for FGB hooks open --- 11:30pm (4/18);
- ISS in free drift for undocking --- 1:02:30am (4/19)
- Hooks Open command --- 1:03:30am; automatic undocking from SM on DO15;
- Separation springs action (delta-V ~0.12 m/sec) --- 1:06:30pm;

- Manual separation burn (15 sec, ~0.65 m/sec) --- 1:09:30am;
- ISS attitude control handover to US --- 2:00am;
- Deorbit Burn start (delta-V 115.2 m/sec) --- 3:40:42am;
- Deorbit Burn complete --- 3:45:06am
- Tri-Module separation (140.1 km) --- 4:04:37am;
- Atmospheric entry (102.5 km, with ~170 m/sec) --- 4:07:30am;
- Max G-load (32.7 km alt) --- 4:14:10am;
- Parachute deploy command (10.6 km alt) --- 4:16:07am;
- 15S Landing (DO2) --- 4:31am EDT; 11:31am Moscow DMT; 2:31pm local Kazakhstan;
- Local Sunset --- 9:36am (8:36pm local).

[Note: Kazakhstan time = GMT+6h; EDT+10h. Moscow DMT = EDT+7h.]

What the Soyuz TMA-11 crew will experience during their reentry/descent:

For the reentry, Malenchenko, Whitson and Yi will be wearing the Russian Kentavr anti-G suit. *[The Kentavr garment is a protective anti-g suit ensemble to facilitate the return of a long-duration crewmember into the Earth gravity. Consisting of shorts, gaiters, underpants, jersey and socks, it acts as countermeasure for circulatory disturbance, prevents crewmember from overloading during descent and increases orthostatic tolerance during post-flight adaptation. Russian crewmembers are also advised to ingest fluid-electrolyte additives, viz., three sodium chloride tablets during breakfast and after the midday meal, each time with 300 ml of fluid, and two pills during the meal aboard Soyuz before deorbit.]*

Before descent:
Special attention will be paid to the need for careful donning of the medical belt with sensors and securing tight contact between sensors and body.

During preparation for descent, before atmosphere reentry, crewmembers settle down comfortably in the Kazbek couches, fasten the belts, securing tight contact between body and the seat liner in the couch.

During de-orbit:
Dust particles starting to sink in the Descent Module (SA) cabin is the first indication of atmosphere reentry and beginning of G-load effect. From that time on, special attention is required as the loads increase rapidly.

Under G-load effect during atmosphere reentry the crew expects the following experience:

Sensation of G-load pressure on the body, burden in the body, labored breathing and speech. These are normal sensations, and the advice is to "take them coolly". In case of the feeling of a lump in the throat, this is no cause to "be nervous". This is frequent and should not be fought. Best is to "try not to swallow and talk at this moment". Crew should check vision and, if any disturbances occur, create additional tension of abdominal pressure and leg muscles (strain abdomen by pulling in), in addition to the Kentavr anti-G suit.

During deployment of pilot parachute (0.62 & 4.5 square meters), drogue chute (16 sq.m.) and main (518 sq.m.) chutes the impact accelerations will be perceived as a "strong snatch". No reason to become concerned about this but one should be prepared that during the parachutes deployment and change ("rehook") of prime parachute to symmetrical suspension, swinging and spinning motion of the SA occurs, which involves vestibular (middle ear) irritations.

It is important to tighten restrain system to fasten pelvis and pectoral arch. Vestibular irritation can occur in the form of different referred sensations such as vertigo, hyperhidrosis, postural illusions, general discomfort and nausea. To prevent vestibular irritation the crew should "limit head movement and eyes movement", as well as fix their sight on motionless objects.

Just before the landing (softened by six small rocket engines behind the heat shield):
Crew will be prepared for the vehicle impact with the ground, with their bodies fixed along the surface of the seat liner in advance. "Special attention should be paid to arm fixation to avoid the elbow and hand squat" (instruction). Landing speed: ~9.9 m/sec.

After landing:
Crew should not get up quickly from their seats to leave the SA. They were advised to stay in the couch for several minutes and only then stand up. In doing that, they should limit head and eyes movement and avoid excessive motions, proceeding slowly. They and their body should not take up earth gravity in the upright position too quickly.

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port, 1:03:30am EDT)
04/19/08 -- Soyuz TMA-11/15S landing (4:30am EDT, 11:30am Moscow/DMT, 2:30pm Kazakhstan)
05/07/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS (5:01pm EDT)

06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
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10/01/08 -- **NASA 50 Years**
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10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
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11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
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04/23/09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/16/09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
09/03/09 -- STS-129/ULF3/Discovery - ELC1, ELC2
10/22/09 -- STS-130/20A/Endeavour – Node-3 + Cupola
01/21/10 -- STS-131/19A/Atlantis - MPLM(P)
03/18/10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
04/29/10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/17/08
Date:	Thursday, April 17, 2008 9:49:20 AM
Attachments:	image001.jpg

ISS On-Orbit Status 04/17/08

All ISS systems continue to function nominally, except those noted previously or below. *Day 8 of joint E16/E17 operations by CDR-16 Peggy Whitson, FE-1-16 Yuri Malenchenko, FE-2-17 Garrett Reisman, CDR-17 Sergei Volkov, FE-1-17 Oleg Kononenko and SFP/VC14 So-Yeon Yi. Day 190 in space for Peggy & Yuri.*

Yesterday, Peggy Whitson set a new US endurance record of 374 days for the longest cumulative time spent in space, held before by Mike Foale (heading the list: Sergei Krikalev with 803 days).

(See Peggy's picture at bottom, uplinked overnight by a grateful Flight Control Team).

With undocking time on 4/19 approaching, the ISS crew went on an irregular sleep/ wake cycle:

- Wake #1 this morning: 2:00am – 10:00am EDT;
- "Nap": 10:00am – 2:00pm
- Wake #2: 2:00pm – 1:00am (4/18)

Tomorrow:

- Sleep: 1:00am – 12:30pm
- Wake for E16/E17: 12:30pm - 4:45am (4/19) – *E16 departs @ 1:06am*

Saturday:

- Sleep for E17: 4:45am – 2:00am (4/20).

Aboard ISS, the E16/E17 crew rotation/handover activities continue. Whitson, Volkov, Malenchenko and Kononenko have several hours crewtime between them for dedicated ("functional") CDR/CDR & FE/FE handover activities. In addition, there are "generic" handovers where crewmembers are scheduled together to complete various designated standard tasks.

Upon wake-up, CDR-17 Sergei Volkov terminated his MBI-12 SONOKARD experiment session (his first), started last night, by taking the recording device from his SONOKARD sports shirt pocket and later copying the

measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

From the US voluntary "job jar" task list, after wake-up and before breakfast, FE-2 Garrett Reisman & SFP (Space Flight Participant) So-Yeon Yi again downloaded the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data from their Actiwatches to the HRF-1 (Human Research Facility 1) laptop. Yi is participating for NASA under a Space Act agreement with South Korea. *[To monitor the crewmember's sleep/wake patterns and light exposure, crewmembers wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

Floating in the Soyuz TMA-11/15S Orbital Module (BO), FE-1 Malenchenko dismantled and removed the LKT local temperature sensor commutator (TA251MB) of the BITS2-12 onboard telemetry system, along with its PZU-1M ROM (read-only memory) unit, now no longer required since the BO is to be jettisoned before 15S reentry. *[The electronics was to be stowed on ISS for reuse in a future Progress vehicle.]*

CDR Whitson cleared out some stowed equipment in Node-2 to make room for the setup and activation of the EarthKAM system by Reisman on 4/19 (first time in Node 2).

Dr. Whitson also conducted flow tests on the CDRA (Carbon Dioxide Removal Assembly) as part of the ongoing troubleshooting of the assembly's delta pressure anomaly. *[The first two attempts at CDRA troubleshooting have been inconclusive as to the cause of the delta-P increase but point to problems likely stemming from a blockage in the no.2 Desiccant/Absorbent Bed (DAB 202). Today's task was to evaluate flow conditions at three ports of DAB 202 to confirm where the blockage is. This task must be performed before Mission 1J to allow launch of a spare DAB if needed and its R&R during the docked period.]*

Oleg Kononenko and Sergei Volkov, with Malenchenko's handover assist, completed the periodic checkout of the HMS CMRS (Health Maintenance System/ Crew Medical Restraint System), followed by a health check of the HMS RSP

(Respiratory Support Pack).

The FE-1-17 gathered measurements for the regular atmospheric status check for $ppCO_2$ (pp Carbon Dioxide) in the Lab, SM (at panel 449) and COL (Columbus Orbital Laboratory), using the hand-held CDMK (CO_2 Monitoring Kit, #1002). Batteries were to be replaced if necessary.

The CDR-17 conducted the periodic time synchronization between the RSS1 and the BSPN payload server, after testing functionality by checking data comm between the two computers and synching RSS1 to station time, in support of payload data transfers from the BSPN for subsequent downlink on OCA comm (via the Russian RSS1 laptop to a PCMCIA flash card). The transfer pertained to a parameter table that was copied from BSPN into the RBO-3-3 Matryoshka radiation hardware. *[Before RSS1/BSPN synchronization, the RSS1 is updated with the exact time as per the station clock (which in turn is synchronized daily from RGS/ Russian Ground Site). Experiment control application is a payload file transfer program called ShellForKE.];*

Peggy & Garrett performed the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week.]*

FE-1 Malenchenko used the standard ECOSFERA equipment, set up yesterday, to conduct microbial air sampling runs for the MedOps SZM-MO-21 experiment, with the POTOK Air Purification System temporarily powered down, taking samples from cabin surfaces along with samples from crewmembers for sanitation and disease studies. The sample tubes were then stowed in the Kriogem-03 refrigerator for return on TMA-11. *[The equipment, consisting of an air sampler set, a charger and power supply unit, provides samples to help determine microbial contamination of the ISS atmosphere, specifically the total bacterial and fungal microflora counts and microflora composition according to morphologic criteria of microorganism colonies.]*

Yuri, with Sergei, also performed the MO-22 Sanitary-Epidemiological Status check, part of the Russian MedOps program. *[To monitor for microflora, Yuri collected samples from surface areas of interior panels and hardware at various places in the Service Module (SM), the FGB, and the ATV "Jules Verne", using cotton swabs and special test tubes which were then stowed in 15S for return to the ground.]*

Later, the FE-1 used the Russian IPD-NH_3 Draeger tubes, on a cartridge belt with a pump, to check the cabin air for NH_3 (ammonia, from possible urine spillage),

followed by the periodic air sampling with the AK-1M adsorber around the SM work table. The samplers were also stowed in the Soyuz 15S Descent Module for analysis on the ground.

In preparation for his return to gravity, Yuri Malenchenko undertook the second session of his fifth and final training session of the Russian MO-5 MedOps protocol of cardiovascular evaluation in the below-the-waist reduced-pressure device (ODNT, US: LBNP) on the Russian VELO ergometer, assisted by CDR Whitson as CMO (Crew Medical Officer). The activity was then closed out. *[The one-hour assessment, supported by ground specialist tagup (VHF) and telemetry monitoring from Russian ground sites (at 6:11am EDT), uses the Gamma-1 ECG equipment with biomed harness, skin electrodes and a blood pressure and rheoplethysmograph cuff wired to the cycle ergometer's instrumentation panels. The Chibis ODNT provides gravity-simulating stress to the body's cardiovascular/ circulatory system for evaluation of Malenchenko's orthostatic tolerance (e.g., the Gauer-Henry reflex) after several months in zero-G. The preparatory training generally consists of first imbibing 150-200 milliliters of water or juice, followed by two cycles of a sequence of progressive regimes of reduced ("negative") pressure, set at -20, -25, -30, and -35 mmHg for five min. each, then -25, -30, and -35 mmHg (Torr) for 10 min. each plus 30mmHg for 5 min. while shifting from foot to foot at 10-12 steps per minute, while wearing a sphygmomanometer to measure blood pressure. The body's circulatory system interprets the pressure differential between upper and lower body as a gravity-like force pulling the blood (and other liquids) down. Chibis data and biomed cardiovascular readings are recorded. The Chibis suit (not to be confused with the Russian "Pinguin" suit for spring-loaded body compression, or the "Kentavr" anti-g suit worn during reentry) is similar to the U.S. LBNP facility (not a suit) used for the first time on Skylab in 1973/74, although it appears to accomplish its purpose more quickly.]*

FE-1-17 Kononenko serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out" cycle to vacuum on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated tonight at ~6:35pm EDT. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. Filter bed 1 was regenerated yesterday.]*

FE-2 Reisman continued his support of the CSLM-2 (Coarsening in Solid-Liquid Mixtures 2) experiment in the MSG (Microgravity Science Glovebox), today transferring the data for SPU-4 (Sample Processing Unit 4) from the ECU (Electronics Control Unit) to the MSG laptop, then removing SPU-4 from the WV (Work Volume) and installing SPU-8 for the next run. MSG was later powered down from its A31p laptop (~8:55am).

Afterwards, Garrett performed the periodic inspection & cleaning of the FDS (Fire Detection & Suppression) system's bacteria filters and SDs (smoke detectors) in the US Airlock (A/L), Node-1, Lab, and Node-2.

The FE-2 also worked in the ATV "Jules Verne", rearranging temporarily stowed equipment to adjust the location of the vehicle's CG (center-of-gravity) for stable flight control, should its separation become necessary in a contingency. The stowage configuration was to be photographed for ground evaluation.

Both Whitson & Malenchenko are scheduled for another standard pre-descent PMC (Private Medical Conference) today.

After the rest period ("nap"), built in from 10:00am to 2:00pm to support synchronization of the crew's wake/sleep cycle for the Soyuz departure early on 4/19, today's second work period extends from 2:00pm to 1:00am tomorrow (4/18) morning.

First thing after their "nap", Peggy & Garrett will be closing out their second session of the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function) by collecting one final dry saliva sample. A final saliva & blood collection is planned for tomorrow. *[IMMUNE protocol requires the collection to occur first thing post-sleep, before eating, drinking and brushing teeth, and all samples are stored at ambient temperature. Along with NUTRITION (Nutritional Status Assessment), INTEGRATED IMMUNE samples & analyzes participant's blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The liquid saliva collections require that the crewmembers soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations.]*

Whitson & Reisman will then work on EVA equipment in the A/L, resizing EMU (Extravehicular Mobility Unit) #3018 for Robert Kimbrough for use on STS-126/ULF2 and EMU #3004 for Ronald Garan for contingency use on STS-124/1J.

Yuri Malenchenko will wrap up Russian biotech payloads for return on TMA-11 *[specifically BTKh-12 (BIOEKOLOGIYA), BTKh-8 (BIOTREK), BTKh-31 (ANTIGEN) and BTKh-29 (GINSENG).]*

Garrett Reisman is scheduled to fill out the regular FFQ (Food Frequency Questionnaire), his fifth, on the MEC (Medical Equipment Computer). *[On the*

FFQs, NASA/ESA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]

Yuri again has several hours reserved for packing & stowing of equipment on TMA-11, focusing mainly on a long list of discarded equipment which he secures in the Orbital Module, to be jettisoned along with the Instrumentation Compartment before the Descent Module's atmospheric entry.

SFP So-Yeon Yi, with Sergei & Oleg taking photo/video imagery of her VC14 activities as required, finishes up her KAP (Korean Astronaut Program) science experiments, which includes work on –

- *KAP01/Growth &mutation of plant seeds (monitoring, photography, filling out questionnaire),*
- *KAP02/Identification of fruit fly genes responsive to gravity and responsible for aging (monitoring, video recording, later stowing),*
- *KAP06/Study of the possibility of using traditional Korean food in onboard food rations (testing during crew Breakfast, Lunch & Dinner, with video coverage),*
- *KAP10/Earth observations; and*
- *KAP11/Noise level reduction onboard the ISS RS (prep & setup, taking noise measurements and imagery at various locations, tearing down hardware & preparing kit for return).*

So-Yeon also has two regular daily tagups with her consultant team at TsUP-Moscow via VHF-1 (~3:30am EDT; ~8:10pm), her fourth PAO TV interview, today with three children from Yangyang as well as with her mother (~6:25am), and a commemorative ("symbolic") activity on the air, performing a "Show & Tell" with a "Cheonsangyoulchaboonya (Space) Map", discussion of various flags from Korea, a Ten-Thousand Won paper money bill, and reading some poetry.

At ~9:35pm, So-Yeon is scheduled for an ARISS (Amateur Radio on ISS) ham radio session with students and teachers at Dae Jeon Science Hall in Korea.

Working off the voluntary Russian task list, So-Yeon also will transfer imagery and other data before sleeptime tonight from flash card to her RSK2 laptop HDD (Hard Disk Drive) for return to the ground.

Later, at 3:10pm, CDR Whitson will set up the video camera system for covering and recording the traditional Change-of-Command Ceremony at 3:20pm at which the Sergei Volkov will formally replace Peggy Whitson as the new ISS Commander for Expedition 17.

Reisman is to conduct the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Malenchenko will complete the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Working off the Russian discretionary “time permitting” task list, Yuri is to perform the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder). *[GCF-JAXA will be moved to TMA-11 tomorrow for return.]*

At ~8:00pm, Reisman will set up and activate the VDS MPC (Video Distribution System/Multi-Purpose Converter) with its four downlinks to allow the ground to “pull down” accumulated HDTV (high-definition TV) footage of onboard activities. Later (~9:05pm), the MPC will be powered off again.

The crewmembers are scheduled for their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), RED resistive exercise device (CDR, FE-1-17, FE-2) and VELO bike with bungee cord load trainer (FE-1, CDR-17).

Afterwards, Sergei downloads the crew’s exercise data file to the MEC for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

VolSci Program: For the Voluntary Science program on 4/21 (Monday), Garrett Reisman was offered two choices for his selection: (1) a session with the SLAMMD (Space Linear Acceleration Mass Measurement - Body Mass Measurement) experiment; (2) an EPO (Education Payload Operations) Demo on space careers, creating a video discussing different careers found at NASA, to be used to produce an educational product to enhance existing education resources for students in grades 9-12. Selection is required ASAP.

CEO photo target uplinked for today was **Lake Nasser, Toshka Lakes, Egypt** *(looking left of track for Lake Nasser in the foreground and the string of Toshka lakes beyond, in Egypt's southern desert. Images of shorelines to show the present status of declining water levels are of greatest interest)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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04/29/10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

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A tribute to Peggy "Rosie the Riveter" Whitson -

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/16/08
Date:	Wednesday, April 16, 2008 12:10:02 PM
Attachments:	

ISS On-Orbit Status 04/16/08

All ISS systems continue to function nominally, except those noted previously or below. *Day 7 of joint E16/E17 operations by CDR-16 Peggy Whitson, FE-1-16 Yuri Malenchenko, FE-2-17 Garrett Reisman, CDR-17 Sergei Volkov, FE-1-17 Oleg Kononenko and SFP/VC14 So-Yeon Yi. Day 189 in space for Peggy & Yuri.*

The crew's work/sleep cycle again was adjusted slightly, from yesterday's wakeup at 2:20am to 2:15am EDT (sleeptime tonight at 5:45pm). Tomorrow, work period will be adjusted again (to 2:00am–12:00pm).

Aboard ISS, crew rotation/handover activities continued for all six residents involved. Whitson, Volkov, Malenchenko and Kononenko had several hours scheduled between them for dedicated ("functional") CDR/CDR & FE/FE handover activities; in addition, there are "generic" handovers where crewmembers are scheduled together to complete various designated standard tasks.

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After wake-up, FE-1-17 Kononenko terminated his MBI-12 SONOKARD experiment session (his first), started last night, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through*

computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]

CDR Whitson & FE-2 Reisman finished up their second session of the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function) by collecting one final wet saliva sample first thing after wake-up. *[IMMUNE protocol requires the collection to occur first thing post-sleep, before eating, drinking and brushing teeth, and all samples are stored at ambient temperature. Along with NUTRITION (Nutritional Status Assessment), INTEGRATED IMMUNE samples & analyzes participant's blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The liquid saliva collections require that the crewmembers soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations.]*

FE-1 Malenchenko, with Kononenko observing, performed the periodic servicing of the Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The regen process will be terminated before sleeptime, at ~3:30pm EDT. Regeneration of bed #2 follows tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods.]*

FE-2 Reisman set up the ROBoT trainer, including the Node-1 camcorder for recording, and used it with CDR-17 Volkov as handover for a proficiency drill for the upcoming SSRMS/Robotics ops. Later, Garrett tore down the setup and stowed it. *[ROBoT uses DOUG (Dynamic Operations Ubiquitous Graphics) software, a hand controller and two laptops (one for graphics, one for the simulation) for on-orbit training of MSS (Mobile Service System) and SSRMS (Space Station Remote Manipulator System) operations. The training should be performed once every four weeks (unless crewmember actually performs arm ops). This OBT (Onboard Training) lesson is designed to refresh cognitive skills related to SSRMS operations. Degradation of these skills could affect mission success and safety of the crew.]*

Malenchenko & Kononenko completed the periodic (about twice a month) replenishing of the Elektron oxygen generator's water supply for electrolysis, filling

the KOV EDV container with water collected in CWC (Contingency Water Container) #1065 from the Lab CCAA (Common Cabin Air Assembly) dehumidifier. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron shutdown.]*

Oleg completed his first radiation data monitoring & logging session for flow & dose power data with the MATRYOSHKA-R radiation payload and its LULIN-5 electronics box. *[Data were downloaded, accumulated readings were recorded on a log sheet for subsequent downlink to TsUP/Moscow via the BSR-TM payload data channel, and the memory storage card was replaced].*

In preparation for their return to gravity, Yuri Malenchenko undertook his fifth and final training session of the Russian MO-5 MedOps protocol of cardiovascular evaluation in the below-the-waist reduced-pressure device (ODNT, US: LBNP) on the Russian VELO ergometer, assisted by CDR Whitson as CMO (Crew Medical Officer). A second session is scheduled tomorrow. *[The one-hour assessment, supported by ground specialist tagup (VHF) and telemetry monitoring from Russian ground sites (at 6:11am EDT), uses the Gamma-1 ECG equipment with biomed harness, skin electrodes and a blood pressure and rheoplethysmograph cuff wired to the cycle ergometer's instrumentation panels. The Chibis ODNT provides gravity-simulating stress to the body's cardiovascular/circulatory system for evaluation of Malenchenko's orthostatic tolerance (e.g., the Gauer-Henry reflex) after several months in zero-G. The preparatory training generally consists of first imbibing 150-200 milliliters of water or juice, followed by two cycles of a sequence of progressive regimes of reduced ("negative") pressure, set at -20, -25, -30, and -35 mmHg for five min. each, then -25, -30, and -35 mmHg (Torr) for 10 min. each plus 30mmHg for 5 min. while shifting from foot to foot at 10-12 steps per minute, while wearing a sphygmomanometer to measure blood pressure. The body's circulatory system interprets the pressure differential between upper and lower body as a gravity-like force pulling the blood (and other liquids) down. Chibis data and biomed cardiovascular readings are recorded. The Chibis suit (not to be confused with the Russian "Pinguin" suit for spring-loaded body compression, or the "Kentavr" anti-g suit worn during reentry) is similar to the U.S. LBNP facility (not a suit) used for the first time on Skylab in 1973/74, although it appears to accomplish its purpose more quickly.]*

Peggy Whitson collected ITCS (Internal Thermal Control System) fluid samples in the Lab and in COL (Columbus Orbital Facility) for return to the ground for analysis. *[The ammonia coolant samples were collected in special bags, which were then packed in a Ziplock bag (#1009).]*

FE-1-17 Kononenko gathered water samples in the Russian Segment from the

Service Module (SM) SVO-ZV Water Supply System, BRP-M Water Distribution & Heating Unit (Hot tap) and SM Rodnik BV1 water storage tank. All samples were prepared for return on TMA-11.

The FE-1 took the periodic sensor readings of the Russian "Pille-MKS" (MKS = ISS) radiation dosimetry experiment which has ten sensors placed at various locations in the Russian segment (DC1, SM starboard & port cabin windows, ASU toilet facility, control panel, etc.). The flash card with the stored data was removed for return on TMA-11 and replaced with another memory card. *[Nine of the ten dosimeters are read manually.]*

In the SM, Yuri & Oleg took the periodic readings of potentially harmful atmospheric contaminants with the CMS (Countermeasure System) part of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, which uses preprogrammed microchips to measure H_2CO (Formaldehyde, methanal), CO (Carbon Monoxide) and NH_3 (Ammonia), taking one measurement per microchip.

The Russian flight engineers printed out two copies of the formal Russian handover protocol document certifying RS handover/acceptance as part of the standard Change-of-Command procedures scheduled tomorrow. *[Two copies of the ISS RS Handover Protocol were printed out for signature by Malenchenko, Kononenko and Volkov. The first copy remains on ISS, the second copy will be returned to the ground on Soyuz TMA-11.]*

Using the vacuum cleaner and other tools, Garrett performed the periodic US segment (USOS) hatch seal inspection (Node-1 forward, aft & starboard, Lab aft & forward, Node-2 aft, and Joint Airlock, Node-2 aft & starboard) in support of ACS (Atmospheric Control System) maintenance (last time done: 2/6).

Reisman also conducted the hatch seal inspection in the JLP (Japanese Experiment Module Experiment Logistics Module Pressurized Section) module for the first time.

In the Lab, the FE-2 later continued his support of the CSLM-2 (Coarsening in Solid-Liquid Mixtures 2) experiment in the MSG (Microgravity Science Glovebox) facility, terminating the final vacuum draw started yesterday and initiating the first sample run, for SPU-4 (Sample Processing Unit 4). *[SPU-4 will process for 10h 30min, to be followed by the next activity tomorrow. CSLM-2 examines the kinetics of competitive particle growth within a liquid matrix. During this process, small particles shrink by losing atoms to larger particles, causing the larger particles to grow (coarsen) within a liquid lead/tin matrix. This study defined the mechanisms and rates of coarsening that govern the manufacture with metals from turbine*

blades to dental amalgam fillings.]

In preparation for a microbial air sampling session scheduled tomorrow, tonight before sleep time Malenchenko will unstow and set up the MedOps SZM-MO-21 ECOSFERA equipment, initiating charging on the Ecosphere power pack (BP). *[The equipment, consisting of an air sampler set, a charger, power supply unit, and incubation tray for Petri dishes, determines microbial contamination of the ISS atmosphere, specifically the total bacterial and fungal microflora counts and microflora composition according to morphologic criteria of microorganism colonies.]*

Peggy Whitson performed a battery check on the PDA (Personal Digital Assistant) set up for charging yesterday, then undertook a series of tests of its new RFID (Radio Frequency ID) software by using it with a scanner to test RFID tags on various items for evaluation as an auditing tool. *[Tests of the SDTO (Station Development Test Objective) included scans of RFID-tagged items delivered on 28P, to be compared by the ground with as-packed 28P data, also scans of RFID-tagged items after a period of crew usage, followed by a manual audit, for subsequent comparison with these manual audit data. The use of the system for locating RFID-tagged items was also tried out.]*

With the temporary increase in crew size from three to six placing more emphasis on ventilation, Whitson is also scheduled to conduct the currently daily check of the function of the important IP-1 airflow sensors in the various Russian segment (RS) hatchways. *[The inspection includes the passageways PrK (SM Transfer Compartment)–ATV, PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1.]*

Garrett meanwhile conducted the periodic checkup on active U.S. payloads, i.e., cleaning the ANITA (Analyzing Interferometer for Ambient Air) inlet plus inspecting and filter cleaning of the CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) incubator payload. *[The CGBA incubator is controlled from the ground, with automatic video downlinked to Earth. ANITA continues to collect data every six seconds and downlinks the data daily to the ground team. ANITA monitors low levels of potential gaseous contaminants in the ISS cabin atmosphere with a capability of simultaneously monitoring 32 gaseous contaminants. The experiment is testing the accuracy and reliability of this technology as a potential next-generation atmosphere trace-gas monitoring system for ISS and future spacecraft. This is a cooperative investigation with ESA.]*

Yuri had three hours reserved for packing and stowing of equipment on TMA-11, focusing mainly on a long list of discarded equipment which he stowed in the Orbital Module, to be jettisoned along with the Instrumentation Compartment before atmospheric entry of the Descent Module.

SFP So-Yeon Yi, with Sergei & Oleg taking photo/video imagery of her VC14 activities as required, conducted her KAP (Korean Astronaut Program) science experiments, which included work on –

- *KAP01/Growth &mutation of plant seeds (monitoring, photography, filling out questionnaire),*
- *KAP02/Identification of fruit fly genes responsive to gravity and responsible for aging (monitoring, video recording, later stowing),*
- *KAP04/SFP medical monitoring (taking six measurements of ocular [eye] pressure during the day);*
- *KAP06/Study of the possibility of using traditional Korean food in onboard food rations (testing during crew Breakfast, Lunch & Dinner, with video coverage),*
- *KAP08/Synthesis of metal-organic porous materials in microgravity (retrieval & closeout),*
- *KAP09/High-resolution telescope (ELT) and study of micro-electro-mechanical system (MEMS) for next generation telescopes (equipment deactivation, filling out questionnaire, deinstalling the gear), and*
- *KAP11/Noise level reduction onboard the ISS RS (prep & setup, taking noise measurements and imagery at various locations, tearing down hardware & preparing kit for return).*

So-Yeon also had one regular daily tagup with her consultant team at TsUP-Moscow via VHF-1 (~10:55am EDT), her third PAO TV interview, today with Figure Skater Kim Yu-na (~7:35am), and a standard PMC (Private Medical Conference).

Working off the voluntary Russian task list, So-Yeon was to transfer imagery and other data before sleeptime tonight from flash card to her RSK2 laptop HDD (Hard Disk Drive) for return to the ground.

Later tonight, Peggy Whitson will have another standard pre-descent PMC via S- & Ku-band audio/video.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), RED resistive exercise device (CDR, FE-1-17, FE-2) and VELO bike with bungee cord load trainer (FE-1, CDR-17).

Afterwards, Peggy downloaded the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Kononenko conducted the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Oleg also did the daily IMS (Inventory Management System) maintenance, updating/ editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Working off the Russian discretionary “time permitting” task list, Malenchenko performed the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder).

At ~1:15pm, Peggy Whitson & Garrett Reisman engaged in two PAO TV interviews with US clients,- CBS News (Bill Harwood, Peter King), and ABC News (Gina Sunseri).

CEO photo targets uplinked for today were **Mt. Etna, Sicily** *(nadir pass over Etna, which is usually smoking. Detailed images were requested),* **Mississippi Delta Region** *(CEO researchers requested images of this site again for more nadir views than have been acquired thus far),* **Plum Island Ecosystem, Maine** *(looking left from ISS track over Cape Cod Bay, for an estuary on the bay next north of Boston. Changing nutrient flows in the estuary, where urban pressures have increased greatly, are the object of the research. Data for many aspects of the research [water color, new housing, loss of natural landscapes, etc.] can be gleaned from ISS/CEO imagery),* and **Johnston Island reef, central Pacific** *(looking a touch right of nadir for this atoll [only 4 km long] with its surrounding, much longer coral reef. The atoll lies about 1400 km west of Hawaii and has been enlarged to accommodate a large runway. Crew was to shoot detail of the reef, for the reef-mapping project)*.

CEO photography can be studied at this “Gateway” website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 5:54am EDT [= epoch]):*
Mean altitude -- 337.4 km
Apogee height -- 338.3 km
Perigee height -- 336.5 km
Period -- 91.28 min.
Inclination (to Equator) -- 51.64 deg

Eccentricity -- 0.000135
Solar Beta Angle -- -28.2 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 98 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53877

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port, 1:06:30am EDT)
04/19/08 -- Soyuz TMA-11/15S landing (4:31am EDT, 11:31am Moscow/DMT, 2:31pm Kazakhstan)
05/07/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
04/23/09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/16/09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
09/03/09 -- STS-129/ULF3/Discovery - ELC1, ELC2
10/22/09 -- STS-130/20A/Endeavour – Node-3 + Cupola

01/21/10 -- STS-131/19A/Atlantis - MPLM(P)
03/18/10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
04/29/10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/15/08
Date:	Tuesday, April 15, 2008 3:00:08 PM
Attachments:	

ISS On-Orbit Status 04/15/08

All ISS systems continue to function nominally, except those noted previously or below. *Day 6 of joint E16/E17 operations by CDR-16 Peggy Whitson, FE-1-16 Yuri Malenchenko, FE-2-17 Garrett Reisman, CDR-17 Sergei Volkov, FE-1-17 Oleg Kononenko and SFP/VC14 So-Yeon Yi. Day 188 in space for Peggy & Yuri.*

The crew's work/sleep cycle again was adjusted slightly, from yesterday's wakeup at 2:15am to 2:20am EDT (sleeptime tonight at 5:50pm). Tomorrow, work period will again be adjusted by 5 min (to 2:15am–5:45pm).

Aboard ISS, crew rotation/handover activities continued for all six residents involved. Whitson, Volkov, Malenchenko and Kononenko had several hours scheduled between them for dedicated ("functional") CDR/CDR & FE/FE handover activities; in addition, there are "generic" handovers where crewmembers are scheduled together to complete various designated standard tasks.

From the US voluntary "job jar" task list, after wakeup and before breakfast, FE-2 Garrett Reisman & SFP (Space Flight Participant) So-Yeon Yi again downloaded the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data from their Actiwatches to the HRF-1 (Human Research Facility 1) laptop. Yi is participating for NASA under a Space Act agreement with South Korea. *[To monitor the crewmember's sleep/wake patterns and light exposure, crewmembers wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

Yuri Malenchenko finished Part 2 of his second stress test plus saliva and blood sampling of the ESA/Russian biomed experiment "IMMUNO", today completing remaining urine sample collections and conducting close-out ops. Specimens were stowed in a special urine containment bag in the KRIOGEM-3M refrigerator (blood

samples were secured yesterday in the MELFI {Minus Eighty Degree Celsius Laboratory Freezer for ISS} in cold packs). *[IMMUNO is a 24-hr. test of human immune system changes, with the objective to investigate immune neuro-endocrine reactions in the space environment by studying samples of saliva, blood and urine using collection kits and the biomedical (MBI) protection kit. Also included are entries in a fluid/medications intact log, and a stress-test questionnaire to be filled out by the subject at begin and end of the first day, based on the accompanying MO-3 stress test, performed during the subject's physical exercise regimen.]*

Following his concluding "IMMUNO" session, Malenchenko took air samples with the IPD-NH_3 Draeger tubes sampler, testing for ammonia (NH_3) in the SM (Service Module), i.e., checking for spilled urine.

After FE-2 Reisman prepared the auditory test equipment, he, CDR-17 Volkov & FE-17 Kononenko took the periodic O-OHA (on-orbit hearing assessment) test, a 30-min. NASA environmental health systems examination to assess the efficacy of acoustic countermeasures, using a special MEC laptop application. It was the first session for the three crewmembers. *[The O-OHA audiography test involves minimum audibility measurements for each ear over a wide range of frequencies (0.25-10 kHz) and sound pressure levels, with the crewmembers using individual-specific Prophonics earphones, Bose ANC headsets and the SLM (sound level meter). To conduct the testing, the experimenter is supported by special EarQ software on the MEC, featuring an up/down-arrow-operated slider for each test frequency that the crewmember moves to the lowest sound pressure level at which the tone can still be heard. The baseline test is required not later than about Flight Day 14 for each new Expedition and is then generally performed once per month. Note: There have been temporary hearing deficits documented on some U.S. and Russian crewmembers, all of which recovered to pre-mission levels.]*

Malenchenko, Whitson & Yi spent three hours in the TMA-11 Descent Module (SA) to conduct the Soyuz descent drill, a standard training exercise for every crew returning on a Soyuz. The exercise, which strictly forbids any command activation (except for switching the InPU display), was supported by a tagup and discussions with ground instructor at TsUP/Moscow via S-band. *[The session includes a review of the pertinent ODFs (operational data files), specifically the books on Soyuz Ascent & Descent Procedures, Emergency Descents, and Off-Nominal Situations, crew responsibilities when executing the flight program, visual crew recognition of SUS (Entry Control System) failures, spacesuit procedures, etc., with special emphasis on operations with the Neptune-ME cockpit console. The training uses a Descent Simulator application on the RSK1 laptop. During the actual descent, Malenchenko, as Soyuz CDR, will occupy the middle couch, with Yi in the right seat and Whitson in the Descent Module's left Kazbek couch. Pending the*

final State Commission decision at about 3.5h before undocking, 15S return is expected for 4/19 (next Saturday), with undocking at 1:03:30am EDT and landing about 82 km from Arkalyk/Kazakhstan at ~4:30am (2:30pm Kazakhstan time). See below for details.]

In preparation for an upcoming software reload, the CDR plugged a PDA (Personal Digital Assistant) into an A31p SSC (Station Support Computer) laptop for recharging its battery.

CDR-17 Volkov set up for his first biweekly NOA/Nitric Oxide Analyzer (MBI-21) session and undertook the procedure, later filling in the electronic log book on the RSE1 laptop, downlinking images to TsUP via OCA, copying photos to the RSK1 laptop hard drive for return, and restowed the hardware. *[Purpose of the ESA experiment ESANO1, last performed by Oleg Kotov, consisting of the "Platon" analyzer and its power supply, is to monitor expired nitric oxide (NO) in the subject's exhaled air to detect signs of airway inflammation and indications of venous gas emboli (bubbles) that may be caused by inhalation of pollutants in the closed environment of the ISS cabin and increased risk of decompression sickness.]*

Volkov also continued his work with the Russian KPT-2 science payload BAR-RM, Kelvin, Ira and TTM-2, begun yesterday, today terminating Kelvin charging and initiating TTM-2 charging, later terminating it. *[BAR-RM is designed to develop a procedure for detection of air leakage from ISS modules based on environmental data anomalies (temperature, humidity, ultrasound emissions). The payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/thermometer (TTM-2), an ultrasound analyzer (AU-01), and a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station. Measurements are taken in specific zones (13 in SM PkhO and 4 in DC1), both with lights & fans turned on and off. The BAR instruments' batteries need to be recharged every two months to keep them at their peak performance.]*

Garrett Reisman completed a 30-min. Robotics OBT (Onboard Training) session to "brush up" on a number of basic maneuvers for the SSRMS (Space Station Remote Manipulator System) required during his tenure on Increment 17. *[The review included such tasks as unloading the arm, grappling & ungrappling an MPLM (Multi-Purpose Logistics Module), single-joint maneuvering to EVA pickup, maneuvering to an S0 truss location, and performing an emergency EVA dropoff at the Airlock.]*

Malenchenko, with Volkov observing, spent some time on the GANK-4M real-time Harmful Contaminant Gas Analyzer of the Service Module (SM) pressure control & atmospheric monitoring system (SOGS), adjusting a measurement coefficient ("Coefficient B") and taking atmospheric readings.

Yuri & Sergei also performed a health check on a the FPP ST-64 electronic interference filter, designed to protect the ATV from electromagnetic interference (EMI), by connecting it to the MMTs-01 Multimeter and testing for resistance, i.e., electric continuity.

In the Lab, Garrett Reisman continued his support of the CSLM-2 (Coarsening in Solid-Liquid Mixtures 2) experiment in the MSG (Microgravity Science Glovebox) facility in preparation for experiment operations scheduled tomorrow. *[Evacuation activities consisted in closing vacuum vent valves, checking for acceptable humidity levels, and opening the SPU (Sample Processing Unit) water valve to initiate unattended vacuum prep, followed later by closing the SPU water valve, checking again for humidity levels in the sample chamber, and opening the vent valve and vacuum valve to initiate a vacuum draw on the sample chamber. The steps were later repeated for another SPU. CSLM-2 examines the kinetics of competitive particle growth within a liquid matrix. During this process, small particles shrink by losing atoms to larger particles, causing the larger particles to grow (coarsen) within a liquid lead/tin matrix. This study defined the mechanisms and rates of coarsening that govern the manufacture with metals from turbine blades to dental amalgam fillings.]*

Peggy Whitson completed the T+2 in-flight microbiology analysis of water samples collected in the ATV “Jules Verne” in MCDs (Microbial Capture Devices) on 4/13, while Garrett Reisman (as functional handover) performed the T+2 analysis on the samples collected by him in the SM. The analysis, which also uses coliform detection bags, involves visual inspection for colony growth and data recording. *[The water samples were taken from the ATV water tank and the SM SRV-K (Condensate Water Processor) Hot and Warm water taps. Some of the samples taken on 4/13 will return on Flight 1J for ground analysis.]*

Reisman also conducted the periodic (every two weeks) inspection of the RED (Resistive Exercise Device) canister bolts for re-tightening if required, followed by the monthly inspection of canister cords and RED accessories.

The two new Inc17 crewmembers, Sergei & Oleg, continued their familiarization overview of the onboard exercise equipment, today focusing on the anaerobic RED device.

Besides their extensive handover activities with Peggy and Yuri, the two “newcomers” Sergei & Oleg assisted SFP Yi in conducting her KAP (Korean Astronaut Program) science experiments, particularly in taking photo/video imagery of the VC14 activities where required.

So-Yeon Yi's busy schedule today included work on –

- *KAP01/Growth &mutation of plant seeds (monitoring, photography, filling out questionnaire),*
- *KAP02/Identification of fruit fly genes responsive to gravity and responsible for aging (monitoring, video recording, later stowing),*
- *KAP04/SFP medical monitoring (Holter cardiac recording equipment, experiment termination & closeout);*
- *KAP06/Study of the possibility of using traditional Korean food in onboard food rations (testing during crew Breakfast, Lunch & Dinner, with video coverage),*
- *KAP07/Growth of Zeolite crystals, super crystals, and crystal layers in microgravity (equipment transfer, assembly, setup in SM, removing samples G.H.I, from oven & conducting closeout ops),*
- *KAP08/Synthesis of metal-organic porous materials in microgravity (oven temperature check),*
- *KAP09/High-resolution telescope (ELT) and study of micro-electro-mechanical system (MEMS) for next generation telescopes (equipment deactivation, video recording, filling out questionnaire, remounting and activating equipment at window, questionnaire),*
- *KAP14/Educational experiment; demo of Surface Tension in zero-G),*
- *KAP15/Recording scenes of daily life & activities of the SFP, using Samsung Gx-10 and Samsung NV11 cameras. (Footage to be downlinked on 4/17).*

So-Yeon also had one regular daily tagup with her consultant team at TsUP-Moscow via VHF-1 (~10:35am EDT) and her third telephone interview with a Korean radio station (~4:20am).

Working off the voluntary Russian task list, So-Yeon was to transfer imagery and other data before sleeptime tonight from flash card to her RSK2 laptop HDD (Hard Disk Drive) for return to the ground.

With the temporary increase in crew size from three to six placing more emphasis on ventilation, CDR-17 Volkov conducted the currently daily check of the function of the important IP-1 airflow sensors in the various Russian segment (RS) hatchways. *[The inspection includes the passageways PrK (SM Transfer Compartment)–ATV, PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1.]*

Kononenko conducted the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Volkov completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

At ~5:30pm, shortly before sleep time, Oleg is scheduled to set up the Russian MBI-12 SONOKARD (Sonocard) payload and started his first experiment session, using a sports shirt from the SONOKARD kit with a special device in the pocket for testing a new method for acquiring physiological data without using direct contact on the skin. Measurements are recorded on a data card for return to Earth. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember’s physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

Working off the Russian discretionary “time permitting” task list, Malenchenko performed the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder).

At 11:00am EDT, all crewmembers, including SFP So-Yeon Yi, gathered in the US segment for the “traditional” live televised SFP/Joint Crew News conference, with US media at NASA Centers (~15 min.) and Russian/Korean media at TsUP-Moscow (~15 min.).

At ~1:25pm, Peggy Whitson & Garrett Reisman engaged in two PAO TV interviews with US clients,- SPACE.COM (Tariq Malik) and Houston Chronicle (Mark Carreau).

Whitson & Malenchenko underwent another standard pre-descent PMC (Private Medical Conference) via S- & Ku-band audio/video.

At ~2:15pm, Reisman set up and activated the VDS MPC (Video Distribution System/Multi-Purpose Converter) with its four downlinks to allow the ground to “pull down” accumulated HDTV (high-definition TV) footage of onboard activities. Later (~3:20pm), the MPC will be powered off again.

The periodic US segment hatch seal inspection was added to the discretionary “job jar” task list for the FE-2.

The crewmembers completed their regular 2.5-hr. physical workout program (about

half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (CDR, FE-1/fulltime), and RED resistive exercise device (FE-2). Volkov & Kononenko also performed their first physical exercise session on ISS, Sergei on the Russian VELO bike with bungee cord load trainer, Oleg on the RED.

Afterwards, Peggy & Sergei downloaded the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Handover Background: Handover activities between E16 & E17 crewmembers are designed to cover a large variety of onboard systems & operations, including Safety, Communications, Video & Audio, Life Support (SOZh), US Segment, TORU/ Teleoperator Control, EVA Tools, ATV Status, Science Hardware, Medical Equipment, Iridium-9505A phone, CISN (Crew Informational Support System), BVS/ Onboard Computer System, etc. FE-1 Malenchenko has 13:15 hrs scheduled for equipment preparation for return & disposal stowage on Soyuz 15S, with 3 hrs of assistance by Sergei Volkov.

What will the Soyuz TMA-11 crew experience during their reentry/descent?
For the reentry, Malenchenko, Whitson and Yi will be wearing the Russian Kentavr anti-G suit. *[The Kentavr garment is a protective anti-g suit ensemble to facilitate the return of a long-duration crewmember into the Earth gravity. Consisting of shorts, gaiters, underpants, jersey and socks, it acts as countermeasure for circulatory disturbance, prevents crewmember from overloading during descent and increases orthostatic tolerance during post-flight adaptation. Russian crewmembers are also advised to ingest fluid-electrolyte additives, viz., three sodium chloride tablets during breakfast and after the midday meal, each time with 300 ml of fluid, and two pills during the meal aboard Soyuz before deorbit.]*

Before descent:
Special attention will be paid to the need for careful donning of the medical belt with sensors and securing tight contact between sensors and body.

During preparation for descent, before atmosphere reentry, crewmembers settle down comfortably in the Kazbek couches, fasten the belts, securing tight contact between body and the seat liner in the couch.

During de-orbit:
Dust particles starting to sink in the Descent Module (SA) cabin is the first indication of atmosphere reentry and beginning of G-load effect. From that time on, special attention is required as the loads increase rapidly.

Under G-load effect during atmosphere reentry the crew expects the following experience:
Sensation of G-load pressure on the body, burden in the body, labored breathing and speech. These are normal sensations, and the advice is to "take them coolly". In case of the feeling of a lump in the throat, this is no cause to "be nervous". This is frequent and should not be fought. Best is to "try not to swallow and talk at this moment". Crew should check vision and, if any disturbances occur, create additional tension of abdominal pressure and leg muscles (strain abdomen by pulling in), in addition to the Kentavr anti-G suit.

During deployment of pilot parachute (0.62 & 4.5 square meters), drogue chute (16 sq.m.) and main (518 sq.m.) chutes the impact accelerations will be perceived as a "strong snatch". No reason to become concerned about this but one should be prepared that during the parachutes deployment and change ("rehook") of prime parachute to symmetrical suspension, swinging and spinning motion of the SA occurs, which involves vestibular (middle ear) irritations.

It is important to tighten restrain system to fasten pelvis and pectoral arch. Vestibular irritation can occur in the form of different referred sensations such as vertigo, hyperhidrosis, postural illusions, general discomfort and nausea. To prevent vestibular irritation the crew should "limit head movement and eyes movement", as well as fix their sight on motionless objects.

<u>Just before the landing (softened by six small rocket engines behind the heat shield):</u>
Crew will be prepared for the vehicle impact with the ground, with their bodies fixed along the surface of the seat liner in advance. "Special attention should be paid to arm fixation to avoid the elbow and hand squat" (instruction). Landing speed: ~9.9 m/sec.

<u>After landing:</u>
Crew should not get up quickly from their seats to leave the SA. They were advised to stay in the couch for several minutes and only then stand up. In doing that, they should limit head and eyes movement and avoid excessive motions, proceeding slowly. They and their body should not take up earth gravity in the upright position too quickly.

CEO photo targets uplinked for today were **Lake Nasser, Toshka Lakes, Egypt** *(images of shoreline change along Lake Nasser as well as around the Toshka Lakes were requested. Dark lake water stands out well against the light desert background. Lake levels have been dropping for two years after rising for several years. The Toshka lakes in southern Egypt were developed in order to draw farming populations from the overpopulated Nile Delta in the north. Falling water*

levels are thus a worrying sign for the project), **Charlevoix Impact Crater, Quebec** *(this ancient crater [345 million years old] has been heavily affected by the evolution of the St. Lawrence Gulf, and then by repeated glaciations in the last 3 million years, so that only half the crater appears. With a diameter of 54 km, it is a comparatively large feature and easy to locate on the north bank of the Gulf. [The crater is heavily built up and farmed so that the ring itself is less easy to detect although the topographic image shows the morphology well.]),* and **Slate Islands Impact Crater, Lake Superior** *(this 30-km-diameter crater is 450 million years old. It is one of the easiest to detect from low earth orbit, because it makes up a circular set of islands near the north shore of Lake Superior).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 1:29am EDT [= epoch]):*
Mean altitude -- 337.5 km
Apogee height -- 338.4 km
Perigee height -- 336.7 km
Period -- 91.28 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0001259
Solar Beta Angle -- -24.8 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 180 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53859

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port, 1:03:30am EDT)
04/19/08 -- Soyuz TMA-11/15S landing (4:30am EDT, 11:30am Moscow/DMT, 2:30pm Kazakhstan)
05/07/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)

09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
04/23/09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/16/09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
09/03/09 -- STS-129/ULF3/Discovery - ELC1, ELC2
10/22/09 -- STS-130/20A/Endeavour – Node-3 + Cupola
01/21/10 -- STS-131/19A/Atlantis - MPLM(P)
03/18/10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
04/29/10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/14/08
Date:	Monday, April 14, 2008 4:07:04 PM
Attachments:	

ISS On-Orbit Status 04/14/08

All ISS systems continue to function nominally, except those noted previously or below. *Day 5 of joint E16/E17 operations by CDR-16 Peggy Whitson, FE-1-16 Yuri Malenchenko, FE-2-17 Garrett Reisman, CDR-17 Sergei Volkov, FE-1-17 Oleg Kononenko and SFP/VC14 So-Yeon Yi. Underway: Week 26 of Increment 16.*

The crew's work/sleep cycle again was adjusted slightly, from yesterday's wakeup at 2:10am to 2:15am EDT (sleeptime tonight at 5:45pm). Tomorrow, work period will again be adjusted by 5 min (to 2:20am–5:50pm).

Aboard ISS, the E16/E17 crew rotation/handover period went underway with full activity schedules for all six residents involved. Whitson, Volkov, Malenchenko and Kononenko had several hours crewtime between them for dedicated CDR/CDR & FE/FE handover activities. In addition, there are "generic" handovers where crewmembers are scheduled together to complete various designated standard tasks.

From the US voluntary "job jar" task list, after wakeup and before breakfast, FE-2 Garrett Reisman & SFP (Space Flight Participant) So-Yeon Yi again downloaded the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data from their Actiwatches to the HRF-1 (Human Research Facility 1) laptop. Yi is participating for NASA under a Space Act agreement with South Korea. *[To monitor the crewmember's sleep/wake patterns and light exposure, crewmembers wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

CDR Whitson & FE-2 Reisman wrapped up their second session of the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function) by collecting one final wet saliva sample first thing after

wake-up. *[IMMUNE protocol requires the collection to occur first thing post-sleep, before eating, drinking and brushing teeth, and all samples are stored at ambient temperature. Along with NUTRITION (Nutritional Status Assessment), INTEGRATED IMMUNE samples & analyzes participant's blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The liquid saliva collections require that the crewmembers soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations.]*

After yesterday's unstowing and setting up of the necessary hardware for the ESA/ Russian biomed experiment "IMMUNO", including the KRIOGEM-03M refrigerator, Plasma-03 accessories, CARDIOSCIENCE and SALIVA-IMMUNO kits and wipes, FE-1 Malenchenko today undertook the scheduled session (his last), starting with the first stress test (of two) plus saliva and blood sampling, assisted by CDR-17 Volkov where required for venous blood collection and blood sample processing (smear & in the Plasma-03 centrifuge). Samples were then secured in the MELFI (Minus Eighty Degree Celsius Laboratory Freezer for ISS) in cold packs in their KB-03 container. *[IMMUNO is a 24-hr. test of human immune system changes, with the objective to investigate immune neuro-endocrine reactions in the space environment by studying samples of saliva, blood and urine using collection kits and the biomedical (MBI) protection kit. Also included is a stress-test questionnaire to be filled out by the subject at begin and end of IMMUNO and based on the accompanying MO-3 stress test, performed during the subject's physical exercise regimen.]*

CDR Whitson worked in the JLP (Japanese Experiment Module Experiment Logistics Module Pressurized Section), performing the periodical status and shell temperature check from the MKAM (Minimum Keep-Alive Monitor).

After briefly activating the JLP MKAM fan and moving the JLP's PBA (Portable Breathing Apparatus) from its location COL1PF in the COL (Columbus Orbital Laboratory) to the JLP endcone (JLP1F3), Whitson performed further troubleshooting on the wiring and fixture of the failed JLP GLA (General Luminaire Assembly) P2A, then deactivated the JLP MKAM fan again and returned the PBA to the COL1PF location.

In the COL, Garrett Reisman performed a similar activity, troubleshooting two failed MLU lighting fixtures, MLU1 & MLU7 (which correspond to the USOS GLAs), to determine the possible cause of their failure.

FE-2 Reisman also conducted the periodic inspection of the ELPS (Emergency Lighting & Power Supply) subsystems in Node-2, A/L (US Airlock), COL (Columbus Orbital Laboratory), and Node-1, shown yesterday still as a discretionary activity on the US "job jar" task list.

For their departure on 4/18, Yuri Malenchenko & Peggy Whitson spent an hour in the Soyuz TMA-11/15S Descent Module (SA) supporting a ground-commanded checkout of the Soyuz motion control system (SUD, Mode 2/"Docked") which included pressurization of the Combined Propulsion System (KDU) Section 2 and Tank 2, a test of the pilot's translational hand controller (RUD), and a hot firing of the DPO braking thrusters. KDU maneuver thrusters and DPO lateral thrusters were not fired. The thruster test was nominal, using 15 kg of propellant. *[For the test, station attitude was handed over to Russian thruster control at 8:30am EDT, commanded to free drift at 8:38am, then back to LVLH XVV (Local Vertical Local Horizontal/x-axis in velocity vector) attitude. The one-minute firing started on Daily Orbit 3 at ~8:40am. Attitude control was returned to the U.S. segment (USOS) at 9:27am.]*

Peggy also had another hour set aside for equipment prepacking and transfer to 15S.

Malenchenko, with Kononenko & Volkov observing, conducted his sixth recharging of the Motorola Iridium-9505A satellite phone brought up on Soyuz 15S, a monthly routine job. *[After retrieving it from its location in the TMA-11/15S descent module (BO) at ~6:25am EDT, Yuri initiated the recharging of its lithium-ion battery, monitoring the process every 10-15 minutes as it took place. Upon completion at ~7:45am, the phone was returned inside its SSSP Iridium kit and stowed back in the BO's operational data files (ODF) container. The satphone accompanies returning ISS crews on Soyuz reentry & landing for contingency communications with SAR (Search-and-Rescue) personnel after touchdown (e.g., after an "undershoot" ballistic reentry). The Russian-developed procedure for the monthly recharging has been approved jointly by safety officials. During the procedure, the phone is left in its fire-protective fluoroplastic bag with open flap. The Iridium 9505A satphone uses the Iridium constellation of low-Earth orbit satellites to relay the landed Soyuz capsule's GPS (Global Positioning System) coordinates to helicopter-borne recovery crews. The older Iridium-9505 phones were first put onboard Soyuz in August 2003. The newer 9505A phone, currently in use, delivers 30 hours of standby time and three hours of talk, up from 20 and two hours, respectively, on the older units.]*

In the Lab, after inspecting, activating & configuring the MSG (Microgravity Science Glovebox) facility, Garrett Reisman initiated a new series of vacuum draws on the sample chamber containing an SPU (Sample Processing Unit), by opening the vent

and vacuum valves, for subsequent CSLM-2 (Coarsening in Solid-Liquid Mixtures 2) experiment ops. A second vacuum venting was initiated later in the day. *[CSLM-2 examines the kinetics of competitive particle growth within a liquid matrix. During this process, small particles shrink by losing atoms to larger particles, causing the larger particles to grow (coarsen) within a liquid lead/tin matrix. This study defined the mechanisms and rates of coarsening that govern the manufacture with metals from turbine blades to dental amalgam fillings.]*

Reisman performed maintenance on the MCA (Major Constituents Analyzer), modifying/replacing Mass Spectrometer Assembly ORU connections.

CDR-17 Volkov and FE-1-17Kononenko supported the successful activation of the Elektron oxygen (O_2) generator using the new procedure without the EMI filter on the Elektron's current stabilizer (FPP ST-64) but with ATV "Jules Verne" disconnected from the Service Module (SM) power system. *[Sergei & Oleg first pressurized the BZh Liquid Unit with N_2 (nitrogen) via laptop and later monitored the external temperature of its secondary purification unit (BD) for the first 10 minutes of operations to ensure that there was no overheating.]*

Kononenko also conducted an ISS repressurization test with ATV oxygen by introducing 4.43 mmHg of O_2 in the cabin today from ATV tankage. This was the first use of the ATV-1 GDS (Gas Delivery System).

In addition, the US OGS (Oxygen Generation System) production was increased to 100 % earlier this morning. *[OGS deactivation will occur upon consumption of remaining water in the PWR reservoir, expected later today.]*

The two new Inc17 crewmembers, Sergei & Oleg, prepared for their physical exercise activities by going through an "orientation course" on procedures using the onboard exercise facilities.

Besides his extensive handover activities with Peggy Whitson and the two flight engineers, Volkov assisted SFP Yi in conducting her KAP (Korean Astronaut Program) science experiments, particularly in taking photo/video imagery of the VC14 activities where required.

So-Yeon Yi's busy schedule today included work on –

- *KAP01/Growth &mutation of plant seeds (monitoring, photography, filling out questionnaire),*
- *KAP02/Identification of fruit fly genes responsive to gravity and responsible for aging (monitoring, video recording, later stowing),*

- *KAP03/Development of Bioreactor for use on the ISS,*
- *KAP04/SFP medical monitoring (Holter cardiac recording equipment, experiment setup & start);*
- *KAP05/Study of SFP facial changes using a Moiré screen (preparation, experiment ops session),*
- *KAP06/Study of the possibility of using traditional Korean food in onboard food rations (testing during crew Breakfast, Lunch & Dinner, with video coverage),*
- *KAP07/Growth of Zeolite crystals, super crystals, and crystal layers in microgravity (equipment transfer, assembly, setup in SM, removing samples D,E,F from oven & replacing with G.H; five temperature checks during the day),*
- *KAP08/Synthesis of metal-organic porous materials in microgravity (oven temperature check),*
- *KAP09/High-resolution telescope (ELT) and study of micro-electro-mechanical system (MEMS) for next generation telescopes (equipment deactivation, video recording, filling out questionnaire),*
- *KAP12/Study of molecular memory device characteristics in space habitation environment (preparation, first test);*
- *KAP13/Measurements using the South-Korean developed SMMS (Small Mass Measurement System, calibration, measurements, later termination & cleanup),*
- *KAP15/Recording scenes of daily life & activities of the SFP, using Samsung Gx-10 and Samsung NV11 cameras.*

So-Yeon also had two regular daily tagup with her consultant team at TsUP-Moscow via VHF-1 (~4:05am EDT; ~10:15am) and her second live PAO TV broadcast interview with South Korean 8 O'clock News (~6:55am). *[Anchor: "Korea's first astronaut Yi So-yeon is also an honorary special correspondent from space. Today we will connect with Yi So-yeon, who is in the International Space Station, to hear from her what is going on in the station. Ms. Yi?" Yi: "Yes, I'm here in the International Space Station. Right now, we are orbiting just outside of (name of a place)." Anchor: "I see. Today is your fifth day in the ISS. How are you adapting?" Yi: "(After demonstrating another zero-gravity somersault, which she demonstrated during the first broadcast, she continues with the interview while upside down for about 2 minutes.) "Did I turn better than I did during the first broadcast? My body is gradually adjusting to zero gravity. In space, you quickly learn to move around using your fingers. If you just softly push away from a wall inside the cabin, your body will fly across to the other side. Outside the station, we move around by holding onto a handrail along the cargo bay. There's really no need to use your legs except when you need to support your body." Anchor: "Do astronauts gain weight in zero gravity?" Yi: "Astronauts do not gain a single gram*

of weight even if they eat all they want. Isn't that hard to believe? It's true, though. But it's not necessarily a good thing. Even if your body weight does not increase, body mass does. Mass is unrelated to gravity. So, if you weigh yourself after coming back to Earth, you might find you weigh more than you did before you left. However, most astronauts lose about a kilogram after one week aboard a space flight."…]

Working off the voluntary Russian task list, So-Yeon was to transfer imagery and other data before sleeptime tonight from flash card to her RSK2 laptop HDD (Hard Disk Drive) for return to the ground.

With the temporary increase in crew size from three to six placing more emphasis on ventilation, CDR Whitson conducted the currently daily check of the function of the important IP-1 airflow sensors in the various Russian segment (RS) hatchways. *[The inspection includes the passageways PrK (SM Transfer Compartment)–ATV, PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1.]*

Major science activities in the Russian segment (RS) by Kononenko, with Volkov taking photo/video imagery, today focused on the biotechnological experiments BIOEMULSION (BTKh-14). *[Completing bioreactor thermostatic shell ops & setting up bioreactor in thermostatic chamber, later unplugging thermostat shell (KT) from power outlet, disassembling and stowing.]*

CDR Whitson conducted the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Oleg completed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Sergei set up the Russian KPT-2 "BAR-RM" science payload and prepared it for subsequent operation by initiating battery charging. *[BAR-RM is designed to develop a procedure for detection of air leakage from ISS modules based on environmental data anomalies (temperature, humidity, ultrasound emissions). The payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/thermometer (TTM-2), an ultrasound analyzer (AU-01), and a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station. Measurements are taken in specific zones of ISS modules, both with lights & fans turned on and off.]*

Volkov also conducted his first observation and aerial KPT-3 photography session of environmental conditions for Russia's Environmental Safety Agency (ECON) using the Nikon D2X digital camera with SIGMA 300-800mm telephoto lens, focusing on Dnepr and Volga River contamination.

So-Yeon Yi and the three Russian crewmembers had about two hours set aside for scheduled commemorative (Russian: “symbolic”) activities, a standard tradition for visiting guests and departing expedition crewmembers, today signing and stamping several dozen ISS-16, ISS-17 & VC14 envelopes for Roskosmos, preparing an ISS-16 & ISS-17 flag for Y.A. Gagarin High School No. 66, preparing UN flags and signing ISS-16, ISS-17 & VC14 Certificates, and making a photo/video record of everything.

Volkov, Kononenko and Yi had their standard periodic PMC (Private Medical Conference) via S- & Ku-band audio/video.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (CDR, FE-1/fulltime), and RED resistive exercise device (FE-2).

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Working off the Russian discretionary “time permitting” task list, Malenchenko performed the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder), and

At ~10:40am EDT, Whitson & Reisman participated in a live PAO TV interview with two clients,- FOX News Radio and WOI-TV, Iowa.

Handover Update: Handover activities between E16 & E17 crewmembers are designed to cover a large variety of onboard systems & operations, including Safety, Communications, Video & Audio, Life Support (SOZh), US Segment, TORU/ Teleoperator Control, EVA Tools, ATV Status, Science Hardware, Medical Equipment, Iridium-9505A phone, CISN (Crew Informational Support System), BVS/ Onboard Computer System, etc. FE-1 Malenchenko has 13:15 hrs scheduled for equipment preparation for return & disposal stowage on Soyuz 15S, with 3 hrs of

assistance by Sergei Volkov.

Return Procedures Preps: After the Soyuz TMA-11 descent review on 4/7 and today's test of the Soyuz MCS (Motion Control System (SUD), the standard descent OBT/drill will be conducted tomorrow (4/15).

IMV Update: Peggy's work on the Intermodule Ventilation (IMV) system over the weekend has increased airflow significantly.

Acoustic Dosimetry Update: The acoustic dosimeter worn by FE-1 Malenchenko overnight for 16 hrs with a microphone on the shirt collar has failed, despite a battery change by the crew. No data were acquired for calldown last night.

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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Perigee height -- 336.6 km
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Eccentricity -- 0.0001384
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Orbits per 24-hr. day -- 15.77
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05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking

08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
04/23/09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
07/16/09 -- STS-128/17A/Atlantis – MPLM(P), last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
09/03/09 -- STS-129/ULF3/Discovery - ELC1, ELC2
10/22/09 -- STS-130/20A/Endeavour – Node-3 + Cupola
01/21/10 -- STS-131/19A/Atlantis - MPLM(P)
03/18/10 -- STS-132/ULF4/Discovery – ICC-VLD, MRM1 (contingency)
04/29/10 -- STS-133/ULF5/Endeavour – ELC3, ELC4 (contingency).

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/13/08
Date:	Sunday, April 13, 2008 2:06:35 PM
Attachments:	

ISS On-Orbit Status 04/13/08

All ISS systems continue to function nominally, except those noted previously or below. *Day 4 of joint E16/E17 operations by CDR-16 Peggy Whitson, FE-1-16 Yuri Malenchenko, FE-2-17 Garrett Reisman, CDR-17 Sergei Volkov, FE-1-17 Oleg Kononenko and SFP/VC14 So-Yeon Yi. Sunday. Ahead: Week 26 of Increment 16.*

The crew's work/sleep cycle again was adjusted slightly, from yesterday's wakeup at 2:20am to 2:10am EDT (sleeptime tonight at 5:40pm). Tomorrow, work period will be adjusted by 5 min (to 2:15am–5:45pm).

Aboard ISS, the E16/E17 crew rotation/handover period went underway with full activity schedules for all six residents involved. Whitson, Volkov, Malenchenko and Kononenko had several hours crewtime between them for dedicated CDR/CDR & FE/FE handover activities. In addition, there are "generic" handovers where crewmembers are scheduled together to complete various designated standard tasks.

From the US voluntary "job jar" task list, after wakeup and before breakfast, FE-2 Reisman & SFP (Space Flight Participant) So-Yeon Yi again downloaded the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data from their Actiwatches to the HRF-1 (Human Research Facility 1) laptop. Yi is participating for NASA under a Space Act agreement with South Korea. *[To monitor the crewmember's sleep/wake patterns and light exposure, crewmembers wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

With the CDRA (Carbon Dioxide Removal Assembly) operating, Whitson terminated

the regeneration of METOX (Metal Oxide) CO_2 absorption canisters #0012 & #0013 in the US Airlock (A/L) oven. *[Next on schedule for CDRA: a fan speed test tomorrow.]*

Peggy also unstowed and deployed an acoustic dosimeter, to be worn by FE-1 Malenchenko for the next 16 hrs with a microphone on the shirt collar. Tonight (~5:20pm) the CDR will call down the data from Yuri's dosimeter and restow the instrument.

Today was the periodical water sample collection & processing day for the crew. CDR Whitson started with a procedures review after unstowing two newly arrived sampling kits. With the first kit, Whitson then collected water samples from the ATV (Automated Transfer Vehicle) "Jules Verne" (which took longer than expected due to initially confusing water tank labeling), the other was used by FE-2 Reisman for the nominal sampling in the SM (Service Module). *[Garrett took potable water samples for microbial in-flight analysis at the SRV-K Hot port, SRV-K Warm port & SVO-ZV taps, plus two chemical/archival post-flight samples from SRV-K Warm & SVO-ZV, using jointly approved Russian sampling procedures with the U.S. WS&A (Water Sampler & Archiver) kit for collection.]*

Later, Reisman performed the in-flight analysis using the WMK (Water Microbiology Kit) and its MCDs (Microbial Capture Devices) with Coliform Detection Bags. *[Four samples (one ATV, three SM) were processed. Two chemical post-flight samples from SRV-K Warm & SVO-ZV will be returned on the STS-124/1J flight. Note: Flush water is being reclaimed by mopping it up with towels which are then hung up in the Russian segment (RS) for evaporation, collection & condensation in the SKV2 air conditioner, thus reducing the amount of water to be transferred from the Lab CCAA (Common Cabin Air Assembly) condensate tank to the RS for "Elektron" processing (demineralizing). Also: there is no cold water tap on ISS, but water can be cooled by placing it at certain naturally cold locations.]*

In preparation for his return to gravity, Yuri also undertook his fourth preliminary session of the Russian MO-5 MedOps protocol of cardiovascular evaluation in the "Chibis" below-the-waist reduced-pressure suit (ODNT, US: LBNP) on the VELO ergometer, assisted by Whitson as CMO (Crew Medical Officer). *[The 60-min assessment, supported by ground specialist tagup (VHF) and telemetry monitoring from Russian ground sites (at 8:16am EDT), uses the Gamma-1 ECG equipment with biomed harness, skin electrodes and a blood pressure and rheoplethysmograph cuff wired to the cycle ergometer's instrumentation panels. The Chibis ODNT provides gravity-simulating stress to the body's cardiovascular/ circulatory system for evaluation of Malenchenko's orthostatic tolerance (e.g., the Gauer-Henry reflex) after several weeks in zero-G. The preparatory training*

generally consists of first imbibing 150-200 milliliters of water or juice, followed by a sequence of progressive regimes of reduced ("negative") pressure, set at -25, -30, -35 and -40 mmHg (Torr) for five minutes each while shifting from foot to foot at 10-12 steps per minute, while wearing a sphygmomanometer to measure blood pressure. The body's circulatory system interprets the pressure differential between upper and lower body as a gravity-like force pulling the blood (and other liquids) down. Chibis data and biomed cardiovascular readings are recorded. The Chibis suit (not to be confused with the Russian "Pinguin" suit for spring-loaded body compression, or the "Kentavr" anti-g suit worn during reentry) is similar to the U.S. LBNP facility (not a suit) used for the first time on Skylab in 1973/74, although it appears to accomplish its purpose more quickly.]

Continuing the extended leak checking of the spare BZh Liquid Unit (#056) for the Elektron O_2 generator, Malenchenko, with Volkov & Kononenko observing, charged the unit once again with pressurized N_2 from the BPA Nitrogen Purge Unit (#23) to 1 atm (1 kg/cm^2). The last test pressurization was on 3/14. *[During Elektron operation, the inert gas locked up in the BZh has the purpose to prevent dangerous O_2/H_2 mixing. A leaking BZh cannot be used.]*

Working on the TVIS (Treadmill with Vibration Isolation & Stabilization), Peggy Whitson prepared the new PCMCIA memory/storage cards for CDR-17 Sergei Volkov and FE-1-17 Oleg Kononenko with their physical exercise protocol.

Peggy also unstowed a spare A31p laptop (#1096) plus 60GB HDD (Hard Disk Drive, #1188) and prepared the computer with BIOS settings updated for use as a Russian C&C SSC (Command & Control/Station Support Computer) anywhere in the SSC power chain.

In preparation for his final session of the ESA/Russian biomed experiment "IMMUNO", Yuri Malenchenko set up the IMMUNO urine collection hardware and took air samples with the IPD-NH_3 Draeger tubes sampler (Tube #6), testing for ammonia (NH_3) in the SM. [*IMMUNO is a 24-hr. test of human immune system changes, with the objective to investigate immune neuro-endocrine reactions in the space environment by studying samples of saliva, blood and urine using collection kits and the biomedical (MBI) protection kit. Samples are secured in the MELFI (Minus-Eighty Laboratory Freezer for ISS). Also included are entries in a fluid/ medications intact log, and a stress-test questionnaire to be filled out by the subject at begin and end. Urine is collected during a 24-hour period, conventionally divided into two twelve-hour phases: morning-evening and evening-morning.]*

The FE-1 also closed out the BIO-5 Rasteniya-2 ("Plants-2") experiment, securing

the grown beans from the plants in a bag, retrieving the dry plants and pre-packing the payload equipment for return on Soyuz TMA-12. *[Rasteniya-2 researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}.]*

Besides his extensive handover activities with Oleg Kononenko, FE-1 Malenchenko assisted SFP Yi in conducting her KAP (Korean Astronaut Program) science experiments, switching the KRIOGEM-03 refrigerator to -22 degC and installing Yi's cold packs from KB-03, also taking photo/video imagery of the VC14 activities where required, particularly for KAP15.

So-Yeon Yi's busy schedule today included work on –

- *KAP01/Growth &mutation of plant seeds (monitoring, photography, filling out questionnaire),*
- *KAP02/Identification of fruit fly genes responsive to gravity and responsible for aging (monitoring, video recording, later stowing),*
- *KAP06/Study of the possibility of using traditional Korean food in onboard food rations (testing during crew Breakfast, Lunch & Dinner, with video coverage),*
- *KAP07/Growth of Zeolite crystals, super crystals, and crystal layers in microgravity (equipment transfer, assembly, setup in SM, removing samples A,B,C from oven & replacing with D,E,F; five temperature checks),*
- *KAP08/Synthesis of metal-organic porous materials in microgravity (hardware transfer, assembly and setup, installation of first sample, oven activation, and temperature check, sample retrieval & new setup in oven),*
- *KAP09/High-resolution telescope (ELT) and study of micro-electro-mechanical system (MEMS) for next generation telescopes (re-mounting equipment at SM window 9, activation, video recording, filling out questionnaire),*
- *KAP12/Study of molecular memory device characteristics in space habitation environment (preparation, first test);*
- *KAP14/Educational experiment (three demos: "Space Pen", "Newton's Laws", Momentum, Acceleration & Gravitation"),*
- *KAP15/Recording scenes of daily life & activities of the SFP, using Samsung Gx-10 and Samsung NV11 cameras.*

So-Yeon also had a regular daily tagup with her consultant team at TsUP-Moscow via VHF-1 (~11:25am), a telephone conversation via VHF-1 with a Korean radio station (~5:15am), and a VC14 ham radio session (~6:50am).

With the temporary increase in crew size from three to six placing more emphasis on ventilation, CDR Whitson was scheduled to check on the function of the

important IP-1 airflow sensors in the various Russian segment (RS) hatchways. *[The inspection includes the passageways PrK (SM Transfer Compartment)–ATV, PrK–RO (SM Working Compartment), PkhO (SM Transfer Tunnel)–RO, PkhO–DC1, PkhO–FGB PGO, FGB PGO–FGB GA, FGB GA–Node-1.]*

Major science activities in the Russian segment (RS) by Kononenko, with Volkov taking photo/video imagery, today focused on the biotechnological experiments KONYUGATSIYA (BTKh-10) and BIOEMULSION (BTKh-14). *[KONYUGATSIYA and BIOEMULSION (#02): transfer samples from KRIOGEM-03 to KRIOGEM-03M and setting -03 to -22 degC. For BTKh-14, placing ICEPACs in -03 and activating mixing mode for other samples.]*

CDR-17 Volkov dismantled the ATV control panel in the SM and stowed it for future use.

Oleg Kononenko deinstalled the BUAP Antenna Switch Controller for the ATV approach & docking procedures, photographed the equipment and also put it away in stowage, supported by ground specialist tagup.

Sergei Volkov then worked in the Soyuz TMA-12/16S Descent Module, dismantling the two "Klest" (KL-152) TV cameras and their light units for return to the ground on 15S, temporarily stowing them in the SM.

CDR Whitson conducted the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables and the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV at the SKV-2 air conditioner for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Peggy also gathered weekly data on total operating time & “On” durations of the Russian POTOK-150MK (150 micron) air filter unit of the SM’s SOGS air revitalization subsystem for reporting to TsUP.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (CDR, FE-1/fulltime), and RED resistive exercise device (FE-2).

Working off the Russian discretionary “time permitting” task list, Malenchenko

performed the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder), and

Suggested on the US "job jar" task list for Garrett Reisman's discretionary performance was the periodic inspection of the ELPS (Emergency Lighting & Power Supply) subsystems in Node-2, A/L (US Airlock), COL (Columbus Orbital Laboratory), and Node-1.

Handover Update: Handover activities between E16 & E17 crewmembers are designed to cover a large variety of onboard systems & operations, including Safety, Communications, Video & Audio, Life Support (SOZh), US Segment, TORU/ Teleoperator Control, EVA Tools, ATV Status, Science Hardware, Medical Equipment, Iridium-9505A phone, CISN (Crew Informational Support System), BVS/ Onboard Computer System, etc. FE-1 Malenchenko has 13:15 hrs scheduled for equipment preparation for return & disposal stowage on Soyuz 15S, with 3 hrs of assistance by Sergei Volkov.

Return Procedures Preps: After the Soyuz TMA-11 descent review on 4/7, a test of the Soyuz MCS (Motion Control System (SUD) is scheduled for 4/14, followed on 4/15 by the standard descent OBT/drill.

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 6:31am EDT [= epoch]):*
Mean altitude -- 337.6 km
Apogee height -- 338.3 km
Perigee height -- 337.0 km
Period -- 91.29 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0000975
Solar Beta Angle -- -17.3 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 115 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53831

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
04/18/08 -- Soyuz TMA-11/15S undocking (FGB nadir port, 11:34pm EDT)

04/19/08 -- Soyuz TMA-11/15S landing (2:52am EDT, 9:52am Moscow/DMT, 12:52pm Kazakhstan)
05/07/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/12/08
Date:	Saturday, April 12, 2008 3:51:59 PM
Attachments:	

ISS On-Orbit Status 04/12/08

All ISS systems continue to function nominally, except those noted previously or below. *Day 3 of joint E16/E17 operations by CDR-16 Peggy Whitson, FE-1-16 Yuri Malenchenko, FE-2-17 Garrett Reisman, CDR-17 Sergei Volkov, FE-1-17 Oleg Kononenko and SFP/VC14 So-Yeon Yi.*

Today Russia observes **Denj Kosmonavtov** (Cosmonauts Day) and the world Yuri's Night -- celebrating Yuri Alexeyevich Gagarin's pioneering flight into space 47 years ago. And NASA is observing the 27th anniversary of STS-1, the first Space Shuttle mission to orbit. *[Yuri was accepted into the cosmonaut unit in 1960, at age 26. After his historic 108-min. flight around the Earth in "Vostok 1", which ended with a parachute ejection at 7 km altitude over a farm field near the city of Engels in Saratov Oblast (province), he was promoted to unit leader. Seven years later, on March 27, 1968, Yuri died with a flight instructor in a fighter jet crash. Chief Designer of the thusly inaugurated Soviet human space program was Sergey Pavlovich Korolev. Exactly 20 years later, John Young and Bob Crippen took the Columbia into space for a test mission lasting 2 days 6 hours 20 minutes 52 seconds.]*

The crew's work/sleep cycle shifted again, from yesterday's wakeup at 6:20am to 2:20am EDT (sleeptime tonight at 5:50pm). Tomorrow, work period will shift by 10 min (to 2:10am–5:40pm).

Aboard ISS, the E16/E17 crew rotation/handover period went underway with full activity schedules for all six residents involved. Whitson, Volkov, Malenchenko and Kononenko had several hours crewtime between them for dedicated CDR/CDR & FE/FE handover activities. In addition, there are "generic" handovers where crewmembers are scheduled together to complete various designated standard tasks.

From the US voluntary “job jar” task list, after wakeup and before breakfast, FE-2 Reisman & SFP (Space Flight Participant) So-Yeon Yi downloaded the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data from their Actiwatches to the HRF-1 (Human Research Facility 1) laptop. Yi is participating for NASA under a Space Act agreement with South Korea. *[To monitor the crewmember’s sleep/wake patterns and light exposure, crewmembers wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

Today was the second session for CDR Whitson & FE-2 Reisman with the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function) for collecting wet saliva samples first thing in post-sleep. *[IMMUNE protocol requires the collection to occur first thing post-sleep, before eating, drinking and brushing teeth, and all samples are stored at ambient temperature. Along with NUTRITION (Nutritional Status Assessment), INTEGRATED IMMUNE samples & analyzes participant’s blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The liquid saliva collections require that the crewmembers soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations.]*

Later, Whitson & Reisman conducted the BRASLET SDTO *(Station Development Test Objective)* protocol for Garrett’s first scan session. *[For the SDTO session, the FE-2 had to abstain from caffeine 12 hrs prior to the scan session, heavy meals 4 hrs before and any food at all 2 hrs prior to the scan, plus no exercise 2 hours before and no liquids 30 mins before. SDTO-17011 “Validation of On-Orbit Methodology for the Assessment of Cardiac Function and Changes in the Circulating Volume Using Ultrasound and Braslet-M Occlusion Cuffs (Braslet)” is a collaborative effort between NASA and the Russian FSA (Federal Space Agency), with the goal to establish a valid ultrasound methodology for assessing a number of aspects of central and peripheral hemodynamics and cardiovascular function, specifically in rapid changes in intravascular circulating volume. BRASLET uses Braslet-M occlusion cuffs, i.e., the Russian-made operational countermeasure already pre-calibrated and available onboard for each ISS crewmember. BRASLET employs multiple modes of ultrasound imaging and measurements, in combination with short-term application of Braslet-M occlusive cuffs and cardiopulmonary maneuvers (Valsalva, Mueller) to demonstrate and to evaluate the degree of changes in the circulating volume on orbit. This will be accomplished by*

performing echocardiographic examinations in multiple modes (including Tissue Doppler mode), ultrasound measurements of lower extremity venous and arterial vascular responses to Braslet-M device under nominal conditions and also during cardiopulmonary Mueller and Valsalva maneuvers. Identical measurements will be repeated without Braslet-M, with Braslet-M applied, and immediately after releasing the occlusion device.]

With the CDRA (Carbon Dioxide Removal Assembly) operating, Whitson terminated the regeneration of METOX (Metal Oxide) CO_2 absorption canisters #0017 & #0019 in the US Airlock (A/L) oven, then started the bake-out process on canisters #0012 & #0013.

Peggy also performed the periodic service of the prime CSA-CP (Compound Specific Analyzer-Combustion Products) instrument, replacing its battery with a fresh one (#1182).

Garrett continued his support of the Japanese CW/RW (Cell Wall/Resist Wall) experiment in the MSG EMCS (Microgravity Science Glovebox/European Modular Cultivation System), swapping the ECs (Experiment Containers) on rotor A in order to save as much science as possible for CW/RW - which has been having problems with the hydration. *[CW/RW operates in the EMCS facility in eight special ECs (Experiment Containers) which Garrett recently (3/30) installed on the centrifuges of the facility. The EMCS rack contains two rotating centrifuges, Rotor A & Rotor B, that can support a wide range of small plant & animal experiments under partial gravity conditions.]*

The FE-2 also serviced the U.S. OGS (Oxygen Generation System) which has been producing O_2 in the last few days, removing the PWR (Payload Water Reservoir after verifying that it was empty and replacing it with a full PWR, then reactivating the OPS WDS (Water Delivery System). *[The ground monitored the activity via S-band and returned the unit to "Process" after R&R completion. Like the Elektron, OGS produces O_2 from water by electrolysis, dumping the also generated H_2 (hydrogen) through venting.]*

As standard documentation for each Increment, Garrett took POSSUM (Payload On-orbit Still Shots for Utilization and Maintenance) digital photography of all payload racks that have undergone recent changes, including ER3 (EXPRESS Rack 3) & MSG in COL (Columbus Orbital Laboratory) and ER2, ER5 & HRF1 (Human Research Facility 1) in the Lab. *[POSSUM is a regular payload photo activity that obtains formal electronic situational still shots of any subrack & locker payload that has been moved or reconfigured.]*

Besides his extensive handover activities with Oleg Kononenko, FE-1 Malenchenko assisted SFP Yi in conducting her KAP (Korean Astronaut Program) science experiments, taking photo/video imagery of the VC14 activities where required, particularly for KAP15.

So-Yeon Yi's busy schedule today included work on -

- *KAP02/Identification of fruit fly genes responsive to gravity and responsible for aging (monitoring, video recording, later stowing),*
- *KAP04/SFP medical monitoring (taking four measurements of ocular pressure during the day);*
- *KAP06/Study of the possibility of using traditional Korean food in onboard food rations (testing during crew Breakfast & Dinner),*
- *KAP07/Growth of Zeolite crystals, super crystals, and crystal layers in microgravity (equipment transfer, assembly, setup in SM, activating oven with samples A,B,C, several temperature checks),*
- *KAP08/Synthesis of metal-organic porous materials in microgravity (hardware transfer, assembly and setup, installation of first sample, oven activation, and temperature check),*
- *KAP09/High-resolution telescope (ELT) and study of micro-electro-mechanical system (MEMS) for next generation telescopes (mounting equipment at SM window 9, activation, video recording, filling out questionnaire, deactivation, gear removal from window),*
- *KAP13/Measurements using the South-Korean developed SMMS (Small Mass Measurement System, later termination & cleanup),*
- *KAP15/Recording scenes of daily life & activities of the SFP, using Samsung Gx-10 and Samsung NV11 cameras.*

So-Yeon also had two regular daily tagups with her consultant team at TsUP-Moscow via VHF, and two PAO TV downlinks with VIP personnel at TsUP-Moscow –

- one (~4:50am EDT) with Anatoly N. Perminov, Head of Roskosmos, on the occasion of today's Cosmonautic Day,
- the other (~6:20am) with President Lee Myung-bak of South Korea. *[President Lee: "I can't believe you are actually in space". Yi: "Yes, Then let me show you something (does a somersault). How's that?"… Lee: "I guess all the people feel my feeling in this nation and my heart is filled with unspeakable joy from living in this beautiful place." Yi: "Though it has only been a few days, I can say that this is a wonderful opportunity for me that I will never forget for the rest of my life. It is regrettable that I am enjoying this wonderful experience alone. I believe it was the strength of science that allowed me to enjoy this opportunity. I hope that the Government has more interest so that more people can enjoy this kind of precious opportunity."*

Lee: "Yes, I myself thought more of the space industry while witnessing the process of putting the first Korean in outer space. I realized that the citizens of Korea are interested in space development—more than I thought they were. The space industry is an important factor that determines a nation's competitiveness in the 21st Century. As such, I will provide as much support as possible. I will make efforts so that we will send the second and third Koreans to space in the near future."]

Whitson retrieved a PMIC (Portable Microphone) with bad performance from the Lab forward cone and cleaned its internal relay contacts in an attempt to improve voice transmission.

Peggy also continued troubleshooting IMV (Intermodule Ventilation), cleaning the Node-1 aft IMV fan inlet and taking airflow measurements on the THC (Temperature & Humidity Control) IMV from the A/L to Node-1 at the NOD1O2-35 lower (deck) slots.

With the increase in crew size from three to six placing more emphasis on ventilation, Sergei Volkov was scheduled to check on the function of the important IP-1 airflow sensors in the various Russian segment (RS) hatchways, including the SM-to-DC1 tunnel, and the FGB-to-Node & FGB-to-Soyuz passageways.

Garrett Reisman set up the ARISS (Amateur Radio on ISS) ham radio equipment in the SM and checked out SFP Yi in using the amateur radio equipment. The ham station will remain powered on for the duration of the VC14 mission.

Major science activities in the Russian segment (RS) by Kononenko, with Volkov taking photo/video imagery, today focused on the biotechnological experiments BIOEMULSION and PLAZMIDA. *[BIOEMULSION (BTKh-14): setting up incubator in Bioreactor, activation of mixing mode for culturing. PLAZMIDA (BIO-8): Removing Recomb-K hardware from KRIOGEM-3 at +37degC, activating mobilization and setting up in KRIOGEM-3M thermostat at +4degC, supported by ground specialist tagup.]*

Kononenko transferred a new kit for the "Matryoshka-R" (RBO-3-2) radiation payload suite from Soyuz TMA-12 to the ISS for installation in the RS. *[The complex Matryoshka payload suite is designed for sophisticated radiation studies. Three detectors now in use are positioned in spherical "Phantom" containers in the DC1, four in the stbd crew cabin, under the work table, and behind a panel (#327).]*

Reisman took the CHeCS emergency medical operations OBT (On-Board Training) drill, a 30-min. exercise to refresh his Crew Medical Officer (CMO)'s acuity in applying ACLS (advanced cardio life support) in an emergency. *[The HMS (Health*

Maintenance Systems) hardware, including ACLS equipment, may be used in contingency situations where crew life is at risk. To maintain proficiency, crewmembers spend one hour per month reviewing HMS and ACLS equipment and procedures via the HMS and ACLS CBT (computer-based training). The training drill, each crewmember for him/herself, refreshes their memory of the on-orbit stowage and deployment locations, equipment etc. and procedures.]

Garrett also had another 60 minutes for himself for general orientation (station familiarization & acclimatization) as is standard daily rule for the first two weeks after starting station residency.

At ~4:35am, the crew engaged in a PAO TV exchange with VIP guests at TsUP/ Moscow, headed by Roskosmos Director General Anatoly Perminov, for Cosmonautics Day today, the 47th Anniversary of Yuri Gagarin's launch in Vostok-1.

At ~6:10am, the crew also supported the exchange of greetings and messages between SFP So-Yeon Yi and South-Korean President Myung-bak Lee (see above).

The FE-2 performed the routine daily maintenance of the SOZh (Environment Control & Life Support System, ECLSS) system in the SM, including the ASU toilet facilities systems/replaceables.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (CDR, FE-1/fulltime), and RED resistive exercise device (FE-2).

Afterwards, Yuri was to download the crew's exercise data file to the MEC for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Working off the discretionary "time permitting" task list, Malenchenko performed the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder), and

Handover Update: Handover activities between E16 & E17 crewmembers are designed to cover a large variety of onboard systems & operations, including Safety, Communications, Video & Audio, Life Support (SOZh), US Segment, TORU/ Teleoperator Control, EVA Tools, ATV Status, Science Hardware, Medical Equipment, Iridium-9505A phone, CISN (Crew Informational Support System), BVS/ Onboard Computer System, etc. FE-1 Malenchenko has 13:15 hrs scheduled for

equipment preparation for return & disposal stowage on Soyuz 15S, with 3 hrs of assistance by Sergei Volkov.

Return Procedures Preps: After the Soyuz TMA-11 descent review on 4/7, a test of the Soyuz MCS (Motion Control System (SUD) is scheduled for 4/14, followed on 4/15 by the standard descent OBT/drill.

Weekly Science Update (Expedition Sixteen -- Week 25)

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Completed. Instrument was relocated to FGB for Inc17 measurements (as Russian experiment) and ALTCRISS was re-activated on 4/8.

ANITA: Completed.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System) : The CW/RW Experiment Containers located in EMCS EC position A1, A2, B1 and B2 could not be hydrated due to EMCS Water Supply Subsystem problems. Troubleshooting is ongoing.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): In progress.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Last session (4th) was successfully performed on 4/6.

EuTEF (European Technology Exposure Facility): EuTEF platform is nominal. **DEBIE-2**: Link error still under investigation; **DOSTEL**: On-going science acquisition; **EuTEMP**: Currently inactive as planned; **EVC**: so far further troubleshooting could not be performed due to too low EVC temperature; **EXPOSE**: On-going science acquisition; **FIPEX**: 6-day measurements period with sensors RAM1, RAM4 and ZENITH8 started on 4/8. On 4/10, the sensors turned off suddenly. Under further investigation; **MEDET**: On-going science acquisition; **PLEGPAY**: on 4/10, experiment 1 run was nominally performed; **TRIBOLAB**: on 4/10 the instrument was commanded in Thermal Stabilisation mode in preparation of the first experiment run. On 4/11, the first TRIBOLAB Pin On Disk (POD1) has been started and will run until Soyuz undock.

Fluid Science Laboratory (FSL): The FSL Facility awaits further troubleshooting after 1J/A departure.

GEOFLOW: Deferred. Start of GEOFLOW is pending further FSL troubleshooting/ commissioning activities but is not expected in Inc16 anymore.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Second session has currently started, to run from 4/12 through 4/15.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: "Peggy, thank you for unstowing Garrett's saliva kit and having it ready for him to begin his collections. Garrett, we appreciate your efforts during your early increment Integrated Immune session."

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Complete.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 "Pirs".

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION/REPOSITORY: "Peggy, the Nutrition/Repository PI teams want to say thank you for your fantastic support throughout all five sessions and for the addition of the extra tube during this last activity!"

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Last crew sampling session for Inc16 FE-1 Malenchenko was successfully performed on 4/7. Samples were inserted in MELFI Dewar 4.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): "Peggy, thanks for downloading 1 J/A FE2 and your Actiwatches, as well as initializing the KARI SFP Actiwatch. You also completed your last targeted week of sleep logging. Your only remaining scheduled activity is downloading all three Actiwatches and doffing your and KARI SFP Actiwatches. Thanks for all your additional sleep logging. The PI greatly appreciates it." "Garrett, you have competed your first two Sleep activities (Actiwatch Don and 1st download), and are in-process of completing your first week of sleep logging. Thanks for completing these activities. Any additional sleep logging is above and beyond, and the PI will greatly appreciate it."

SOLAR (Solar Monitoring Observatory): On 4/4, SOLAR was commanded to SIMUL-PM (Pointing Mode (SIMUL-PM) using Station Ancillary data to find the Sun to allow science data acquisition. Sun tracking precision has been estimated to be sufficient to perform science measurements. Problems with ancillary data were observed on 4/9. The anomaly is under investigation. **SOVIM**: Science data acquisition on-going nominally since 4/4; **SOLSPEC**: To allow for sun tracking precision assessment, sun observations were performed on 4/5 after start of SIMUL-PM mode. Commissioning of instrument has been successfully completed on 4/8 and 4/9. SOLSPEC measurements are planned on 4/14-15 in order to cross-compare with Sun instrument on NASA Sounding Rocket launched on 4/14 (12:58pm EDT); **SOLACES**: Commissioning completion planned for 4/11. SOLACES measurements are planned on 4/13-14 in order to cross-compare with Sun instrument on NASA Sounding Rocket on 4/17 (12:58pm).

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): Planned.

CEO (Crew Earth Observation): Through 4/8 the ground has received a total of 17,604 ISS CEO images for review and cataloging. Late this week imagery received included sessions with camera times corresponding to the following daily target requests: Teide Volcano, Canary Islands; Volcan Colima, Mexico; Afar Rift Zone, Ethiopia; Calcutta India; and East Haruj Megafans, Libya. The ground specialists will provide feedback on these acquisitions as they work through them in the coming week. "Feedback on last week's acquisitions includes: Lake Eyre, Australia – excellent coverage, best in many months, suggests moist conditions are returning; Somalia Coast – excellent mapping pass – dry conditions persist as expected – all requirement for this target have been met; Central Arizona-Phoenix – well-focused imagery of much of this target was acquired, but more nadir-looking views will be requested in the future; and the Madrean Sky Islands, northern Mexico – we will continue to work with you to help recognize and acquire imagery of these features. Your recent image of the bizarre landscape of the western Saudi Arabian lava field know as the Harrat Khaybar will be published on NASA/GSFC's Earth Observatory site this weekend. Your photo highlights the spectacular landforms, diverse mineralogy, and climate of this volcanic region. Good eye! Thanks for your good imagery response to our target requests. Any additional feedback you find time to provide on this activity would be most welcome!"

CEO photo targets uplinked for today were **Eastern Tien Shan Mts., China** *(regional contextual images of the eastern half of the range were requested. These will assist in gaining more detailed views of permanent ice caps on this range that are being studied for the effects of climate change),* **South Tibesti Megafans** *(an extensive network of dry, non-functioning stream channels occupies a large area south of the Tibesti Mts [probably dating from the last wet period in the Sahara Desert ~10, 000 years ago]. These channel networks appear to be good analogs for river-like lines on Mars. Overlapping images right of track on the nearer of two megafans were requested),* **Sky Islands, northern Mexico/SW USA** *(the crew was to shoot a mapping swath right of track. "Sky Islands" are the higher elevations of mountains in Mexico's Sierra Madre ranges and the US Southwest which are cool and moist enough for dense forests to flourish. The forested peaks appear as green "islands" in the deserts, mainly of northern Mexico, but also in the US Southwest. The sky islands boast some of the richest biodiversity anywhere in North America. To start this round of change documentation the ground requested*

broad views looking right of track), and **Sevilleta Wildlife Area, New Mexico** *(the Sevilleta LTER [Long Term Ecological Research] Project is located about 80 kilometers south of Albuquerque, New Mexico. The crew was to shoot a mapping swath just right of track, immediately after the Sky Islands target. The Refuge is of great interest because it falls at the geographic intersection of several major biotic zones: Chihuahuan Desert grassland and shrubland to the south, Great Plains grassland to the north, Piñon-Juniper woodland on the neighboring mountains, Colorado Plateau shrub-steppe to the west, and riverbank vegetation along the middle Rio Grande Valley)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:43am EDT [= epoch]):*
Mean altitude -- 337.7 km
Apogee height -- 338.4 km
Perigee height -- 337.1 km
Period -- 91.29 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0000945
Solar Beta Angle -- -13.3 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 154 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53816

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
04/12/08 -- **Cosmonautics Day**, with **Yuri's Night** (check out http://www.yurisnight.net/2008/)
04/18/08 -- Soyuz TMA-11/15S undocking (FGB nadir port, 11:34pm EDT)
04/19/08 -- Soyuz TMA-11/15S landing (2:52am EDT, 9:52am Moscow/DMT, 12:52pm Kazakhstan)
05/07/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)

08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/11/08
Date:	Friday, April 11, 2008 12:50:01 PM
Attachments:	

ISS On-Orbit Status 04/11/08

All ISS systems continue to function nominally, except those noted previously or below. *Day 2 of joint E16/E17 operations.*

The crew's work/sleep cycle shifted again, from yesterday's wakeup at 5:00am to 6:20am EDT (sleeptime tonight at 5:50pm, from 9:30pm). Work period will shift again tomorrow (to 2:20am–5:50pm).

Aboard ISS, the E16/E17 crew rotation/handover period went underway with full activity schedules for all six residents involved.

CDR-17 Sergei Volkov and FE-1-16 Yuri Malenchenko conducted a communications test between the two docked Soyuz vehicles (15S/16S), checking out comm systems both via hard-line mode (MBS) and S-band, and VHF mode on two channels, including the ground (TsUP-Moscow). *[The test was also intended to provide multi-segment comm procedure training. Systems were reconfigured to nominal mode afterwards.]*

In the Soyuz TMA-12/16S Orbital Module, Volkov installed the LKT local temperature sensor switch (TA251M1B) of the BITS2-12 onboard telemetry system and its ROM/read-only memory unit (PZU TA765B), both kept in storage from an earlier Soyuz.

Additionally, Volkov performed the routine task of taking two photos of the internal part of the DC1 port's docking cone, used for yesterday's 16S linkup. These images are used to refine current understanding of docking conditions. The pictures were then transferred to OCA for subsequent downlinking. *[The objective is to take photo imagery of the scratch or scuff mark left by the head of the active docking probe on the internal surface of the passive drogue (docking cone) ring, now rotated out of the passageway. As other crewmembers before him, the CDR-17 used the Nikon D1X digital still camera to take two pictures each with the hatch*

closed down.]

Later today, as part of crew handovers, FE-1-17 Oleg Kononenko is scheduled for the monthly maintenance on the deactivated Russian IK0501 GA (Gas Analyzer) of the SOGS (Pressure Control & Atmospheric Monitoring System) by replacing its CO_2 filter assembly (BF) with a new unit from FGB stowage (done last: 2/29), then reactivating the unit. With Peggy Whitson, the new crewmembers were also to conduct the periodic IK0501 sensor adjustment for O_2 readings. *[IK0501 is an automated system for measuring CO_2, O_2, and H_2O in the air as well as the flow rate of the gas being analyzed].*

After his second session with the ELITE-S2 (Elaboratore Immagini Televisive - Space 2) experiment yesterday, FE-2 Garrett Reisman powered up the payload's IMU (Interface Management Unit) to allow the ground to downlink the data from the session by remote command. Afterwards, Garrett turned the unit off. *[The Italian (ASI) experiment ELITE-S2 is a human motion analysis facility for technological characterization and potential application for multifactorial movement analysis, to study the connection between brain, visualization and motion in micro-G.]*

Major science activities in the Russian segment (RS) by Kononenko today focused on the biotechnological experiment CONJUGATION (Pairing), BIOEMULSION, and PLAZMIDA. *[CONJUGATION: removal of the Recomb-K hybridization experiment from the KRIOGEM-03M thermostat/cooler, process activation at ambient temperature, photography of Recomb-K hardware, completing activation and returning to KRIOGEM at +4 degC. BIOEMULSION (BTKh-14): setting up incubator in Bioreactor, activation of mixing mode for culturing. PLAZMIDA (BIO-8): Removing Recomb-K hardware from KRIOGEM-03M, activating mobilization and setting up in KRIOGEM thermostat at +37degC.]*

SFP So-Yeon Yi worked on her KAP (Korean Astronaut Program) science experiments. *[Today's VC-14 schedule included activities on –*

- *KAP01/Growth &mutation of plant seeds (monitoring, photography, filling out questionnaire),*
- *KAP02/Identification of fruit fly genes responsive to gravity and responsible for aging (monitoring, video recording, later stowing),*
- *KAP05/Study of SFP facial changes using a Moiré screen (preparation, experiment ops session 1),*
- *KAP06/Study of the possibility of using traditional Korean food in onboard food rations (testing during crew Dinner time at ~3:50pm EDT),*
- *KAP07/Growth of Zeolite crystals, super crystals, and crystal layers in microgravity (equipment transfer, assembly, setup in SM),*

- *KAP08/Synthesis of metal-organic porous materials in microgravity (hardware transfer, assembly and setup, installation of first sample, oven activation, and temperature check), and*
- *KAP09/High-resolution telescope (ELT) and study of micro-electro-mechanical system (MEMS) for next generation telescopes (mounting equipment at SM window 9, activation, video recording, filling out questionnaire).]*

The SFP also had a routine PMC (Private Medical Conference) via VHF, the regular daily tagup with her consultant team at TsUP-Moscow via VHF, and a telephone conversation at ~10:50am EDT (23:50 Korean Standard Time) with two listeners (one teen, one adult) from a Korean radio station, chosen from among listeners submitting "Reasons why I want to talk to an astronaut".

Working off a voluntary Russian task list, So-Yeon was to transfer imagery and other data from flash card to her RSK2 laptop HDD (Hard Disk Drive) for return to the ground.

As is standard procedure for newly arrived station residents, Sergei Volkov and Oleg Kononenko had their PMCs (Private Medical Conferences) via S-band.

FE-1 Malenchenko closed out the ESA/RSC-Energia experiment ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS) with its AST Spectrometer and ALC equipment on FGB panel 420. *[Yuri removed PCMCIA card #941 from the AST slot, checked it out on the RSK1 laptop for data quantity and total size of files, and stowed it with nine other memory cards for return to Earth on TMA-11.]*

FE-2 Reisman filled out the regular FFQ (Food Frequency Questionnaire), his fourth, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA/ESA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

In the US Airlock (A/L), CDR Peggy Whitson terminated the regeneration of METOX (Metal Oxide) CO_2 absorption canisters #0020 & #0021 in the A/L's oven, then started the bake-out process on canisters #0017 & #0019.

Whitson & Reisman conducted the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week. The current cue card (16-0018Y), to be updated today, lists 37 CWCs (~1483.4 L total) for the four types of water identified on board: technical water (800.4 L, for Elektron, flushing, hygiene), potable water (647.2 L), condensate water (32.3 L), waste/EMU dump and other (3.7 L). Of the 37 containers, 13 CWCs with technical water (569.4 L) cannot be used until cleared for* Wautersia *bacteria, and 4 CWCs with potable water (176.3 L) are not cleared for use pending analysis of samples returned on 1J/A.]*

The CDR also deactivated and tore down the IWIS (Internal Wireless Instrumentation System) setup used yesterday for measuring structural dynamics data during Soyuz docking.

Yuri Malenchenko performed the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various station hatchways, including the FGB-to-Soyuz tunnel, DC1-to-Soyuz vestibule and FGB-to-Node1 passageway.

For Reisman's first session with the BRASLET experiment, scheduled tomorrow, Peggy and Garrett gathered the necessary equipment, particularly Garrett's cuffs. *[For the SDTO (Station Development Test Objective) scan session, the FE-2 has to abstain from caffeine 12 hrs prior to the scan session, heavy meals 4 hrs before and any food at all 2 hrs prior to the scan, plus no exercise 2 hours before and no liquids 30 mins before. SDTO-17011 "Validation of On-Orbit Methodology for the Assessment of Cardiac Function and Changes in the Circulating Volume Using Ultrasound and Braslet-M Occlusion Cuffs (Braslet)" is a collaborative effort between NASA and the Russian FSA (Federal Space Agency), with the goal to establish a valid ultrasound methodology for assessing a number of aspects of central and peripheral hemodynamics and cardiovascular function, specifically in rapid changes in intravascular circulating volume. Braslet uses Braslet-M occlusion cuffs, i.e., the Russian-made operational countermeasure already pre-calibrated and available onboard for each ISS crewmember. Braslet employs multiple modes of ultrasound imaging and measurements, in combination with short-term application of Braslet-M occlusive cuffs and cardiopulmonary maneuvers (Valsalva, Mueller) to demonstrate and to evaluate the degree of changes in the circulating volume on orbit. This will be accomplished by performing echocardiographic examinations in multiple modes (including Tissue Doppler mode), ultrasound measurements of lower extremity venous and arterial vascular responses to Braslet-M device under nominal conditions and also during cardiopulmonary Mueller and Valsalva maneuvers. Identical measurements will be repeated without Braslet-M, with Braslet-M applied, and immediately after releasing the occlusion device.]*

Sergei gathered measurements for the regular atmospheric status check for ppCO_2 (pp Carbon Dioxide) in the Lab, SM (at panel 449) and COL (Columbus Orbital Laboratory), using the hand-held CDMK (CO_2 Monitoring Kit, #1002). Batteries were to be replaced if necessary.

At ~4:05pm, Reisman is to set up and activate the VDS MPC (Video Distribution System/Multi-Purpose Converter) with its four downlinks to allow the ground to "pull down" accumulated HDTV (high-definition TV) footage of yesterday's arrival of Soyuz 16S. Later (~5:15pm), the MPC will be powered off again.

Malenchenko and Kononenko relocated the three Emergency SODF (Station Operations Data Files) books from Soyuz 16S into the 15S vehicle and updated the ISS EMER-1 SODF with new pages delivered on 16S. *[TMA-12 delivered two new ODF books (VC-14, RPS ISS16/17 Handover) and nine packages of updates to existing books (Med Ops, Med Equipment, Tech Exps, PHOTO, Science Exps, ODF ROMs, Laptop Connectivity Recovery).]*

Volkov performed the routine daily maintenance of the SOZh (Environment Control & Life Support System, ECLSS) system in the SM, including the ASU toilet facilities systems/replaceables.

Later today, Sergei will work on the IMS (Inventory Management System), updating/ editing its standard "delta file", including locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Reisman had another 60 minutes for himself for general orientation (station familiarization & acclimatization) as is standard daily rule for the first two weeks after starting station residency.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (CDR, FE-1/fulltime, FE-2), and RED resistive exercise device (FE-2).

Afterwards, Garrett was to download the crew's exercise data file to the MEC for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Working off the discretionary "time permitting" task list, Yuri Malenchenko –

- performed the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator,

maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder), and

- serviced the BIO-5 Rasteniya-2 ("Plants-2") experiment, which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}), by monitoring the greenhouse, taking pictures and downloading them to the ground.

At ~1:00pm EDT, Peggy Whitson & Garrett Reisman engaged in three interactive PAO TV interviews with U.S. media clients,- WCBS News (Steve Scott), CBS Newspath (Gerry Mazza) and WHO-TV (Patrick Dix).

Handover Update: Handover activities between E16 & E17 crewmembers are designed to cover a large variety of onboard systems & operations, including Safety, Communications, Video & Audio, Life Support (SOZh), US Segment, TORU/ Teleoperator Control, EVA Tools, ATV Status, Science Hardware, Medical Equipment, Iridium-9505A phone, CISN (Crew Informational Support System), BVS/ Onboard Computer System, etc. FE-1 Malenchenko has 13:15 hrs scheduled for equipment preparation for return & disposal stowage on Soyuz 15S, with 3 hrs of assistance by Sergei Volkov.

Return Procedures Preps: After the Soyuz TMA-11 descent review on 4/7, a test of the Soyuz MCS (Motion Control System (SUD) is scheduled for 4/14, followed on 4/15 by the standard descent OBT/drill.

CEO photo targets uplinked for today were **Luquillo Forest, Puerto Rico** *(good near-nadir pass. A swath of overlapping images was requested),* **Santa Maria Volcano, Guatemala** *(looking right, between ISS track and the prominent Lake Atitlan. Santa María volcano had been inactive for at least 500 to several thousand years. But on October 25, 1902 it erupted violently following a series of earthquakes--as one of the largest eruptions of the twentieth century. Skies were darkened over Guatemala for days, with ash detected as far away as northern California. The eruption tore a gaping hole in the south flank of the cone—which is still visible as a vegetationless zone [due to intense rainfall erosion]. A massive new lava dome known as Santiaguito has been growing within the crater since the eruption. Dome growth has been accompanied by almost continuous minor explosions, with periodic lava extrusion, larger explosions, pyroclastic flows, and mud flows),* and **Santa Barbara Coast, California** *(the main objective is to document land cover and the rapid land use change on a seasonal basis. Shooting a mapping swath left and right of track along the coastline, noting any features in the near offshore)*.

CEO photography can be studied at this “Gateway” website:

http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:19am EDT [= epoch]):*
Mean altitude -- 337.9 km
Apogee height -- 338.6 km
Perigee height -- 337.2 km
Period -- 91.29 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0001073
Solar Beta Angle -- -9.1 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 112 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53799

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
04/12/08 -- **Cosmonautics Day**, with **Yuri's Night** (check out http://www.yurisnight.net/2008/)
04/18/08 -- Soyuz TMA-11/15S undocking (FGB nadir port, 11:34pm EDT)
04/19/08 -- Soyuz TMA-11/15S landing (2:52am EDT, 9:52am Moscow/DMT, 12:52pm Kazakhstan)
05/07/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:01pm EDT)
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08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
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09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)

11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/10/08
Date:	Thursday, April 10, 2008 2:56:01 PM
Attachments:	

ISS On-Orbit Status 04/10/08

All ISS systems continue to function nominally, except those noted previously or below.

The ISS crew's work/sleep cycle shifted this morning, from wakeup at 2:00am to 5:00am EDT (sleeptime tonight at 9:30pm, from 5:30pm). Work period will shift again tomorrow (6:20am–5:50pm) and on 4/12 (2:10am–5:40pm).

Yest kasaniya! **Soyuz TMA-12/16S docked smoothly** at the DC1 port at 8:57am EDT, five minutes ahead of time, with Expedition 17 crewmembers CDR Sergei Volkov and FE-1 Oleg Kononenko, plus Korean SFP (Spaceflight Participant) So-Yeon Yi, 14th Visiting Crewmember (VC). After about 1.5 hrs spent in Soyuz on pre-transfer activities, the crew opened hatches, followed by crew transfer, the traditional joyful welcome event and the installation of the BZV QD (quick disconnect) clamps by Volkov and Kononenko at ~12:10pm. *[After successful "kasaniya" (contact), automatic "sborka" (closing of Soyuz & DC1 port hooks & latches) took place shortly thereafter (~9:07am) while ISS was in free drift. Attitude control authority had been handed over to the Russian MCS (Motion Control System) at ~5:25am and was returned to US CMG control at ~10:05am. For the 16S docking, Russian thrusters were disabled during Soyuz volume pressurization and clamp installation; they were afterwards returned to active attitude control (~12:30pm). Before hatch opening, the crew performed leak checks of the Soyuz modules and the Soyuz/ISS interface vestibule. They then doffed their Sokol suits and set them up for drying (~1:05pm), deactivated the Atmosphere Purification Unit (BOA) in the Descent Module (SA), replaced the Soyuz ECLSS LiOH cartridges, equalized Soyuz/ISS pressures, and put the spacecraft into conservation mode on ISS integrated power.]*

Before the docking, CDR Whitson prepared for the arrival by activating the video system with the Japanese SONY HDV camera (backed up by the U.S. SONY PD100 camcorder) in the RS (Russian Segment) for transmitting over the MPEG-2

(Moving Pictures Expert Group 2) encoder from DC1 & SM to downlink via U.S. OpsLAN and Ku-band in “streaming video” packets. *[Later in the day, Peggy deactivated the equipment again and disassembled it, including the hook-up of the UOP DCP (utility outlet panel/display & control panel) power bypass cable at the CUP RWS (Cupola Robotic Work Station).]*

FE-2 Reisman set up the IWIS (Internal Wireless Instrumentation System), verifying proper function of the RSUs (Remote Sensor Units) and NCU (Network Control Unit) for recording structural dynamics (vibrational) data during the docking. Later in the day, Peggy Whitson downloaded the accumulated data to an SSC (Station Support Computer) for subsequent dump to the ground.

FE-1 Malenchenko activated the KRIOGEM-03M refrigerator in the SM to +4 degC for time-critical payload hardware arriving on Soyuz (e.g., BIOEMULSIYA bioreactor, KONYUGATSIYA, BIO-8 PLAZMIDA/Recomb-K).

The FE-1 also configured station comm (STTS) for the docking and later reconfigured it for post-docking nominal hardline mode (MBS).

The CDR also prepared for the arrival by connecting the regular ITCS LTL (Internal Thermal Control System/Low Temperature Loop) coolant jumper connection to the LAB1D6 rack in support of the ground-commanded activation of the U.S. CDRA (Carbon Dioxide Removal Assembly), and Houston lowered the temperature setpoint to the regular 9.4 degC. *[CDRA activation took place at 10:01am-11:01am.]*

Later tonight, with the CDRA running, Whitson is scheduled to start the regeneration of two METOX (Metal Oxide) CO2 absorption canisters in the Airlock’s bake-out oven (#0020, #0021).

Upon docking, on TsUP Go, Malenchenko switched hatch KVDs (Pressure Equalization Valves) between DC1 and Soyuz to electric control mode.

After the arrival, hatch opening, and crew welcome, CDR-17 Sergei Volkov immediately began with payload transfers (e.g., Recomb-K) from Soyuz to ISS and setups.

As part of Soyuz deactivation after the docking, Volkov installed the intermodular air exchange ducting between the Soyuz (through both Orbital & Descent Modules) and the DC1 Docking Compartment. *[The two optional modes for the ducting configuration are with & without air heating.]*

Later, Volkov and FE-1-17 Oleg Kononenko went through the procedures of setting

up and drying out the Sokol spacesuits and gloves worn by the Soyuz travelers.

High-priority payload transfers to the Service Module (SM) for the E-16/E-17 crew rotation period involve

- BIOEMULSIYA bioreactor (set up in the KRIOGEM-03M cooler, with photography); *[BTKh-14 investigates the design and improvement of a closed-type autonomous (thermostat-controlled) bioreactor for obtaining biomass of organisms and bioactive substances (BAV) without additional ingredients input or removal of metabolism products, for bacterial, enzymatic, and pharmaceutical preparations;]*
- KONYUGATSIYA (BTKh-10) in its Biokont-T container (also in KRIOGEM); *[BTKh-10 deals with the processes of genetic material transmission using bacterial conjugation, in the Biokont-T container and Rekomb-K hardware in the KRIOGEM-03M;]*
- ASTROVACCINE (BTKh-27);
- ANTIGEN (set up in Bioecology container #13);
- LAKTOLEN & ARIL (in Bioecology containers #6-1 & #18); *[BTKh-5, ARIL studies the effects of space flight on cultures of Lactolen- and Interleukin ARIL producing cells.]*

The three new arrivals received the obligatory standard Safety Briefing by CDR Whitson to familiarize them with procedures and escape routes in case of an emergency. *[The Briefing included pointing out the location of the "Emergency Response/Visiting Crew" books, showed how to move about the station without getting hurt or accidentally disturbing air flow meters/sensors (PP IP-1) and familiarized the Korean with her switch to a different Soyuz for return.]*

Yuri Malenchenko also took So-Yeon Yi on a one-hour guided tour of the ISS. *[The tour was to acquaint the SFP with both station segments, her living quarters in the RS, her work station in the DC1 Docking Compartment, other work locations, the sites for her scheduled twice-a-day VHF conferences with her Korean advisory group and her ham radio sessions, location of her RSK2 laptop (delivered on TMA-12), stowage of her KAP (Korean Astronaut Program) experiments, uplink printouts and camera equipment for her use, email ops, and PFC (Private Family Conference) using the IP (Internet Protocol) phone.]*

Assisted by Yuri, SFP Yi later transferred and photographed her experiments KAP01 (Growth and mutation of plant seeds), KAP02 (Identification of Drosophila genes responsive to gravity and responsible for aging); and KAP03 (Development of Bioreactor for use on the ISS), checked out the installed removable HDD (Hard Disk Drive) on her RSK2 A31p laptop in the DC1, and donned the Actiwatch for the U.S. SLEEP experiment (in which she participates pursuant to a Space Act agreement with NASA).

FE-2 Garrett Reisman conducted his second session with the ELITE-S2 (Elaboratore Immagini Televisive - Space 2) payload, assisted by Whitson, first detaching the CEVIS (Cycle Ergometer with Vibration Isolation) from the ER3 (EXPRESS Rack 3) and moving it out of the field of view of the cameras crucial to of the experiment, which he set up for capturing his movement protocol. After powering up the IMU (Interface Management Unit) and calibrating the work area for the cameras (half of the work area facing one way, the other half facing the other way), the FE-2 had ~1.5 hrs to perform the test operations, with Whitson taking documentary photographs. Peggy later stowed the test camera and re-installed the CEVIS, while Garrett turned off the IMU. *[The Italian (ASI) experiment ELITE-S2 is a human motion analysis facility for technological characterization and potential application for multifactorial movement analysis, to study the connection between brain, visualization and motion in micro-G. By recording and analyzing the three-dimensional motion of astronauts, this study should help engineers apply ergonomics into future spacecraft designs and determine the effects of weightlessness on breathing mechanisms for long-duration missions. For each of three protocols (e.g., MOVE, IMAGINE), a set of body landmarks are identified and reflective markers are applied on the subject who then performs prescheduled movements with the index finger tips then returns to the initial position (for example, the subject has to reach and brush, without exerting forces). The video cameras trace the trajectories of the body parts of the astronaut catching the light reflected by the markers, thus recording the kinetic and trajectory data of the movement.]*

Peggy Whitson worked on the IMV (Intermodule Ventilation) system between Lab and Node-2, cleaning the duct and diffuser grille and troubleshooting the airflow by checking out the downstream side of the silencer for possible caked FOD (Foreign Object/Debris).

Later today, the CDR will take airflow measurements on the THC (Temperature & Humidity Control) IMV from the Airlock to Node-1 at the IMV fan location, using the Velocicalc instrument.

With the increase in crew size from three to six placing more emphasis on ventilation, Peggy is also scheduled to check on the function of the important IP-1 airflow sensors in the various Russian segment hatchways, including the SM-to-DC1 tunnel, and the FGB-to-Node & FGB-to-Soyuz passageways.

At ~4:40pm EDT, Volkov and Malenchenko will swap out Yi's and Reisman's IELK (Individual Equipment & Liner Kit, Russian: USIL) between the two Soyuz vehicles, TMA-11/15S & TMA-12/16S, including their tailored Sokol spacesuits. The IELKs of Volkov & Kononenko are already in the 16S spacecraft that has now become the

Expedition 17 CRV (Crew Return Vehicle), good for a maximum of 200 days in space, while Whitson's and Malenchenko's IELKs remain in 15S for the return on 4/19. *[A crewmember is not considered transferred until her/his IELK, AMP (Ambulatory Medical Pack) and ALSP (Advanced Life Support Pack) drug kit are transferred. After today's installation of the VC14 IELK, Yi is now considered a 15S crewmember, and* ***Expedition 17 has technically begun its residence*** *aboard ISS, with Peggy Whitson passing her CDR-baton to Sergei Volkov. TMA-11 has been docked at ISS since 10/12/07. By the time of its return on 4/19, the spacecraft will have spent 192 days in space, 8 days short of its "warranty" life.]*

The CDR is scheduled to conduct the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV at the SKV-2 air conditioner for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

On the IMS (Inventory Management System), Yuri will update/edit its standard "delta file", including locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Working off the discretionary "time permitting" task list, Malenchenko performed the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder).

The crewmembers are scheduled for their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Peggy is to download the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

CEO photo targets uplinked for today were **South Tibesti Megafans, Chad** *(relict channels of an extensive megafan river system occupy a large area, probably dating from the last wet period in the Sahara Desert [~10,000 years ago]. These channel networks appear to be good analogs for river-like lines on Mars. Overlapping images immediately right of track were requested: the relict stream beds are located on the light-toned flats* <u>*below*</u> *the dark volcano slopes of the*

Tibesti Mts. [the black volcano slopes are visual cue for the ISS crew], **Lima, Peru** *(Nadir pass),* **London, England, Great Britain** *(looking left of track. The River Thames is the visual cue for the ISS crew),* and **Moorea Coral Reef, Tahiti** *(looking right of track for this coral reef. The Moorea Coral Reef LTER is located 15 km northwest of the main island of Tahiti. Moorea is a high, 1.2 million-year-old volcanic island surrounded by a well developed coral reef and lagoon system).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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07/10/08 -- Russian EVA-20 (7/10-11)
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08/14/08 -- Progress M-65/30P docking (SM aft port)
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1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
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4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/09/08
Date:	Wednesday, April 09, 2008 1:44:09 PM
Attachments:	image001.jpg

ISS On-Orbit Status 04/09/08

All ISS systems continue to function nominally, except those noted previously or below.

Soyuz TMA-12/16S, with Expedition 17 crewmembers CDR Sergei Alexandrovich Volkov (CDR) and Oleg Dmitrievich Kononenko (FE-1), plus Korean SFP (Spaceflight Participant) So-Yeon Yi, 14th Visiting Crewmember (VC) to spend time on the station, continues to catch up with the ISS for the **docking tomorrow morning at ~9:02am EDT.** *(See launch picture below).* *[FD1 activities yesterday included the first two maneuver burns, DV1 (10:57am) & DV2 (11:50am), both with the SKD main engine. FD2 activities, started yesterday afternoon with Soyuz crew wakeup at ~4:05pm on Orbit 12, include systems & crew health status reports to TsUP, preparation of the Soyuz Habitation Module (SA) workspace, building attitude for and executing the DV3 burn, placing Soyuz back in its sun-spinning "barbecue" mode (ISK), and swapping CO_2 absorption cartridges (LiOH) in the BO. Afterwards, the crewmembers will put on their Sokol suits and PKO biomed harnesses, transfer to the SA, activate its air purification system (SOA) and close the hatch to the Descent Module (BO). After activation of the active Kurs-A system on Soyuz and of the passive Kurs-P on the Service Module (SM), with a short Kurs-A/P test and several additional adjustment burns during automated rendezvous, station fly-around to align with the DC1 Docking Compartment will begin tomorrow at ~8:37am at ~400m range, followed by station keeping at ~160m (~8:46am) and docking at the DC1 port at ~9:02am. Volkov & Kononenko will replace Expedition 16 CDR Whitson & FE-1 Malenchenko. FE-2 Dr. Garrett Reisman remains on the station, joining Expedition 17 until early June when he is replaced by U.S. Astronaut Gregory E. Chamitoff on STS-124/1J. So-Yeon Yi, the 30-year old biotechnologist student from KAIST (Korea Advanced Institute of Science & Technology) and South Korea's first astronaut, will return with Peggy & Yuri on 4/19 in Soyuz TMA-11/15S.]*

In preparation for his return to gravity, Yuri also undertook his third preliminary

session of the Russian MO-5 MedOps protocol of cardiovascular evaluation in the "Chibis" below-the-waist reduced-pressure suit (ODNT, US: LBNP) on the VELO ergometer, assisted by Whitson as CMO (Crew Medical Officer). *[The 60-min assessment, supported by ground specialist tagup (VHF) and telemetry monitoring from Russian ground sites (at 5:20am EDT), uses the Gamma-1 ECG equipment with biomed harness, skin electrodes and a blood pressure and rheoplethysmograph cuff wired to the cycle ergometer's instrumentation panels. The Chibis ODNT provides gravity-simulating stress to the body's cardiovascular/ circulatory system for evaluation of Malenchenko's orthostatic tolerance (e.g., the Gauer-Henry reflex) after several weeks in zero-G. The preparatory training generally consists of first imbibing 150-200 milliliters of water or juice, followed by a sequence of progressive regimes of reduced ("negative") pressure, set at -25, -30, -35 and -40 mmHg (Torr) for five minutes each while shifting from foot to foot at 10-12 steps per minute, while wearing a sphygmomanometer to measure blood pressure. The body's circulatory system interprets the pressure differential between upper and lower body as a gravity-like force pulling the blood (and other liquids) down. Chibis data and biomed cardiovascular readings are recorded. The Chibis suit (not to be confused with the Russian "Pinguin" suit for spring-loaded body compression, or the "Kentavr" anti-g suit worn during reentry) is similar to the U.S. LBNP facility (not a suit) used for the first time on Skylab in 1973/74, although it appears to accomplish its purpose more quickly.]*

FE-2 Reisman continued his preparations of the MELFI (Minus Eighty Degree Laboratory Freezer for the ISS) for upcoming sample stowage by swapping trays between Dewars 1 & 3 and retrieving more -32deg ICEPAC belts from stowage for insertion in Dewar 1.

After temporarily deactivating the Russian SKV-2 air conditioner, the FE-1 collected another set of condensate water (KAV) samples from the Condensate Water Recovery System (SRV-K2M), upstream of its Gas-Liquid Mixture Filter (FGS), in empty drink bags for return to Earth on Soyuz 15S.

Malenchenko conducted the periodic time synchronization between the RSS1 and the BSPN payload server, after testing functionality by checking data comm between the two computers and synching RSS1 to station time, in support of payload data transfers from the BSPN for subsequent downlink on OCA comm (via the Russian RSS1 laptop to a PCMCIA flash card). *[Before RSS1/BSPN synchronization, the RSS1 is updated with the exact time as per the station clock (which in turn is synchronized daily from RGS/Russian Ground Site). Experiment control application is a payload file transfer program called ShellForKE.];*

In the DC1 Docking Compartment, the FE-1 reconnected a cable to the comm panel to enable "air-to-air" communications from the approaching Soyuz TMA-12.

As a test of the ground-controlled Russian onboard command sequencer (SPP) for the Korean VC14, Malenchenko conducted a PAO TV broadcast, downlinking messages of greetings for Cosmonautics Day (4/12) to the residents & municipal area of the city of Engels as well as to the students & faculty of the MAI (Moscow Aviation Institute) Aerospace Department. *[At Engels, Yuri Gagarin learned to fly and, with other cosmonauts, practiced parachute jumping. It is also the location where he landed after his historic space flight on April 12, 1961.]*

Later, after Reisman configured the designated A31p laptop in the FGB for converting analog-to-digital video, he and Malenchenko set up the system for a video transmission test from the RS (Russian Segment) over the MPEG-2 (Moving Pictures Expert Group 2) encoder to downlink via U.S. OpsLAN and Ku-band in "streaming video" packets. Afterwards, Garrett deactivated the A31p again.

Garrett performed the periodic offloading of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1062) with the collected water slated for processing. No samples were required this time. *[Estimated offload time before reaching the tank's neutral point (leaving ~6 kg in the tank): ~30 min.]*

The FE-1 completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV at the SKV-2 air conditioner for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Working off the discretionary "time permitting" task list, Malenchenko performed the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder).

A second suggested task for Yuri was the daily monitoring, picture-taking and downloading on the BIO-5 Rasteniya-2 ("Plants-2") experiment. *[Rasteniya-2 researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. During the duration of the BIO-5 experiment, students of the Moscow City Palace for Youth Creativity of the Meshchansky inter-regional center #15 in Moscow and the Prince*

of Oldenburg Lyceum in St. Petersburg are cultivating plants in parallel on the ground and conducting comparative observation of plant growth and development under gravity and zero-gravity conditions. They are receiving the photo images taken by Yuri.]

The crewmembers performed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Peggy downloaded the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~4:10pm, Garrett is scheduled for his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-9 laptop).

OGS Update: In line with the Program decision to keep the Elektron oxygen generator deactivated for power reasons while the ATV vehicle is docked to the ISS, the US OGS (Oxygen Generation System) continues to operate. This morning the OGS production rate has been increased from in 25% to 50% (with day/night cycling enabled). This equates to ~6 lbm/day of O_2 produced. Currently, the corrected ppO_2 (Oxygen partial pressure) is 165.6 mmHg (21.7% max).

Columbus Update: Ground-controlled thermal checkout continues on the COL Air Loop, with air loop temperature control disabled for the duration of the ground commanding. The testing will continue through tomorrow. The crew was informed to minimize their time in Columbus during the testing since the module could have higher than expected temperatures.

CEO photo targets uplinked for today were **Irrawaddy River Delta, Burma** *(continued mapping of the mouths of the Irrawaddy was requested. Many changes in vegetation and stream locations have been noted in this densely farmed zone),* **Chongqing, China** *(this is the biggest city in the western parts of China, with 4.1 million people. Looking a touch right. The city lies on the Chang [Yangtze] River, which is the visual cue from ISS),* **Toshka Lakes, Egypt** *(after many years of rising water levels, the Toshka lakes appear to be experiencing an extended decline. The last imagery was taken six months ago, so new detailed documentation is needed. Looking at nadir and a touch right. Dry lake floors are beginning to appear as water levels decline),* and **Luquillo Forest, Puerto Rico** *(the Luquillo Experimental*

Forest [LEF] on the northeast tip of Puerto Rico, has been a center of tropical forestry research for nearly a century. In addition, the LEF is a recreation site for over half a million people per year, a water supply for approximately 20% of Puerto Rico's population, and a refuge of Caribbean biodiversity. Good 400mm imagery was recently acquired, and 800-mm images are now requested. Looking right on the tip of the island).

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:10am EDT [= epoch]):*
Mean altitude -- 338.2 km
Apogee height -- 338.6 km
Perigee height -- 337.7 km
Period -- 91.30 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0000704
Solar Beta Angle -- -0.3 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 186 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53768

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~9:02am
04/12/08 -- **Cosmonautics Day**, with **Yuri's Night** (check out http://www.yurisnight.net/2008/)
04/18/08 -- Soyuz TMA-11/15S undocking (FGB nadir port, 11:34pm EDT)
04/19/08 -- Soyuz TMA-11/15S landing (2:52am EDT, 9:52am Moscow/DMT, 12:52pm Kazakhstan)
05/06/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)

09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

Launch of Soyuz TMA-12/16S – April 8, 2008

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/08/08
Date:	Tuesday, April 08, 2008 2:43:13 PM
Attachments:	

ISS On-Orbit Status 04/08/08

All ISS systems continue to function nominally, except those noted previously or below.

Our good partners did it again: **Soyuz TMA-12 (16S) launched flawlessly** this morning on time at 7:16:39am EDT *(see Flight Plan at bottom)*. Separations from second & third stage were nominal. Orbit was attained at L+ 8:45 min at an altitude of ~202 km (perigee ~189.6 km/apogee ~230.1 km, downrange ~520 km, velocity ~7.50 km/s). Antennas and solar arrays deployed nominally at orbit insertion. 16S has a planned two-day rendezvous profile, to aim for docking on Thursday, 4/10. *[At orbit insertion, Soyuz unfolded two solar arrays, four Kurs antennas, one TORU/ Rassvet-M antenna and one telemetry antenna. Later, the crew activated antenna heaters, set the maneuver mode, turned on the RKO orbit radio tracking system, started leak checks, etc. Two orbit adjustment burns of ~5 min duration each were executed this morning, DV1 (~25.55 m/s) at ~10:57am, DV2 (~14.27 m/s) at ~11:50am, both with the SKD main engine. After the two-day "chase", supported by several more midcourse burns, 16S will dock at the DC1 Docking Compartment on 4/10 at ~9:02am EDT.]*

The ISS crew had 90 min. reserved for an in-depth review of the on-board VC14 (Visiting Cosmonaut 14) program/timeline, to be executed by SFP (Spaceflight Participant) So-yeon Yi from South Korea during the Soyuz ascent flight and after her arrival in 16S. Duration of the VC14 program is 11 days (from 4/8 to 4/19), with nine days (4/10-4/19) aboard the ISS Russian Segment (RS). *[VC14 comprises 15 experiments plus some additional events, viz.: KA **P01**- Growth and mutation of plant seeds; **KAP02** - Identification of Drosophila genes responsive to gravity and responsible for aging; **KAP03** - Development of Bioreactor for use on the ISS; **KAP04** - SFP medical monitoring project; **KAP05** - Study of SFP facial changes on the ISS using a Moiré screen; **KAP06** - Study of the possibility of using traditional Korean food in onboard food rations; **KAP07** - Growth of Zeolite crystals, super*

crystals, and crystal layers in microgravity; ***KAP08 -*** *Synthesis of metal-organic porous materials in microgravity;* ***KAP09*** *- High-resolution telescope (ELT) and study of micro-electro-mechanical system (MEMS) for next generation telescopes;* ***KAP10 -*** *Earth observations;* ***KAP11*** *- Noise level reduction onboard the ISS RS;* ***KAP12*** *- Study of molecular memory device characteristics in space habitation environment;* ***KAP13*** *- Experiment involving measurements using small mass measurement system (SMMS);* ***KAP14*** *- Educational experiment;* ***KAP15 -*** *Daily life and activities of SFP, using Samsung Gx-10 and Samsung NV11 cameras. Also: Four video conferences between ISS RS & TsUP-Moscow in real-time; two ham radio sessions; internal photo & video imagery on the ISS RS; activity with commemorative items; tagups with Korean cosmonaut advisory group (via Russian comm assets) – twice daily in the mornings and evenings; and Experiment ops with the US SLEEP/Actiwatch program.]*

Afterwards, at ~6:50am EDT, the crew tagged up with ground specialists to discuss the VC14 program.

FE-1 Malenchenko later set up the RS work area for the SFP. *[Preparations for So-yeon Yi included transferring the KUBIK-3 cooler/container from the Soyuz BO (Orbital Module) to the FGB, relocating the ALTCRISS ATS spectrometer from the DC1 to the FGB & photographing the setup, configuring BIOEMULSION experiment hardware in the SM, transferring the KRIOGEM-03 refrigerator to the SM & conducting a temperature test, monitoring MATRYOSHKA LIULIN-5 hardware readings & turning it off (except for its electronics), and preparing a location in the SM for a second KRIOGEM-03 thermostat to be delivered on Soyuz 16S.]*

Malenchenko also collected samples of condensate water (KAV) upstream of the FGS (Gas-Liquid Mixture Filter) of the SRV-K2M (Condensate Water Recovery System) in empty drink bags for return to Earth in 15S.

Afterwards, Yuri conducted a continuity and functions test of the SRV-K2M control panel (PU) of the condensate transfer pump (BPK) and then an activation test of the BPK itself, supported by ground specialist tagup.

FE-2 Reisman conducted the periodic checkup on active U.S. payloads, i.e., cleaning the ANITA (Analyzing Interferometer for Ambient Air) inlet plus inspecting and filter cleaning of the CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) incubator payload. *[The CGBA incubator is controlled from the ground, with automatic video downlinked to Earth. ANITA continues to collect data every six seconds and downlinks the data daily to the ground team. ANITA monitors low levels of potential gaseous contaminants in the ISS cabin atmosphere with a capability of simultaneously monitoring 32 gaseous contaminants. The experiment is testing the accuracy and reliability of this technology as a potential next-*

generation atmosphere trace-gas monitoring system for ISS and future spacecraft. This is a cooperative investigation with ESA.]

The FE-2 also prepared the MELFI (Minus Eighty Degree Laboratory Freezer for the ISS) for upcoming sample stowage by retrieving two -32deg ICEPAC belts from stowage and inserting them in Sections 2 & 3 of Tray C in Dewar 1.

CDR Whitson retrieved and stowed the four passive FMK (Formaldehyde Monitoring Kit) sampling assemblies deployed by her on 4/6 in the Lab (at P3, below CEVIS) and SM (at the most forward handrail, on panel 307), to catch any atmospheric formaldehyde on a collector substrate for subsequent analysis on the ground. *[Two monitors each are usually attached side by side, preferably in an orientation with their faces perpendicular to the direction of air flow.]*

Later, the CDR performed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV at the SKV-2 air conditioner for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Peggy & Yuri spent another hour each on end-of-increment cleanup and departure preparations. *[Instructions on packing of return items and a keep vs. trash list were uplinked for assisting Yuri and Peggy in their preparing for their return in the severely downmass-limited Soyuz Descent Module. Trashed items were stowed in the Orbital Module (BO), to be separated along with the Instrumentation/Propulsion Module prior to atmospheric entry.]*

In the US Airlock, Garrett Reisman, as per ground instruction, opened the PBA (Portable Breathing Apparatus) bottle #1014 to discharge any remaining oxygen. *[Earlier (3/31), during the periodic PEP (Portable Emergency Provisions) inspection, the bottle was reported to show its pressure gauge in the red zone, i.e., low on pressure and unusable. A replacement is being manifested on the ground.]*

The crewmembers performed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1/fulltime), and RED resistive exercise device (CDR, FE-2).

Afterwards, Garrett downloaded the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM

storage medium (done six times a week).

Whitson & Malenchenko held their standard periodic PMC (Private Medical Conference) via S- & Ku-band audio/video.

Reisman had another 60 minutes for himself for general orientation (station familiarization & acclimatization) as is standard daily rule for the first two weeks after starting station residency.

Working off the discretionary "time permitting" task list, Yuri –

- conducted the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur), and
- performed the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder).

At ~4:40am EDT, the crew joined in downlinking two PAO TV messages of greetings on the occasion of the upcoming Cosmonautics Day (4/12), one to the winners of a Children's Art Contest, the other to the Moscow Aviation Institute (MAI) Aerospace Department. *[The "Space and I" Child Art Contest prize award ceremony will take place in Novosibirsk on April 13, while on April 18 prizes will be awarded to the winners of the Space Race Child Art Contest in Star City: "….Dear young friends! We congratulate you on the conclusion of this art contest for kids. We wish you to be full of new bold ideas, bright fantasies, and creative energy, but – most important – to be good people! For this, study well, try to be a bit like the first planet's cosmonaut Yuri Alexeyevich Gagarin, space rocket chief designer Sergey Pavlovich Korolev, and many others.)". MAI Aerospace Dept. students & faculty will gather on Cosmonautics Day in the MAI Cultural Center "to sing, to dance, and to just have fun": "….We wish we were there and we wish you success in your studies and hope you have a good time! To steal a line from a song – We see it all from high above! And we clearly see from here the best students of the 6th Department – Freshman Igor Avdeyenko, Sophomore Sergey Shadsky, Junior Elvira Meipariani, Senior Sergey Chulkov, and Graduate Year student Nina Botvina! Guys, please accept our admiration and thanks from distant space!")]*

At ~1:15pm, Peggy & Garrett held a crew discretionary teleconference via Ku- & S-band.

Soyuz 16S (Expedition 17+1) flight plan for CDR Sergei Alexandrovich Volkov, FE-1 Oleg Dmitrievich Kononenko,and SFP So-Yeon Yi (South Korea):

<u>Flight Day 1</u> (all times EDT):

- 4/8: 7:16am: Launch (L), when ISS was at 164 deg phase angle
- L+1min52sec: Escape rocket jettison (~46 km altitude)
- L+1:53: First stage (four strap-on boosters) separation (~49 km altitude)
- L+2:38: Launch shroud jettison (~84 km)
- L+4:45: Second stage (core) separation (~167 km altitude)
- L+4:57: Third stage lower skirt jettison
- L+8:45: Third stage shutdown (orbital insertion, ~202 km altitude, 7.5 km/s velocity)
- L+8:48: Third stage separation (~202 km) = S
- 7:33:27 At S+8 sec: deployment of 2 solar arrays, 4 Kurs-A antennas, 1 radio antenna (Rassvet-M VHF-2), 1 telemetry antenna (onboard measurement syst.)
- 8:33am: Orbit 2 began (ascending node)
- 9:24am: TsUP issues Soyuz flight vector (position, velocity data)
- 10:02am: Orbit 3 began
- 10:57am: First maneuver burn (DV1) by main propulsion engine
- 11:42am: Orbit 4 began
- 11:50am: Second maneuver burn (DV2) by main propulsion engine
- 1:01pm: Orbit 5 began
- 2:00pm: Crew doffed/stowed Sokol suits
- 2:31am: Orbit 6 began
- 2:31pm: Crew sleep began
- 4:05pm: Crew sleep ends.

***Ahead*:**

- Start ISS Flyaround -- 4/10 (Thu), 8:37am; range ~405m;
- Start Stationkeeping -- 8:46am; range ~160m, below;
- Final Approach -- 8:53am;
- Docking -- 9:02am.

OGS Update: In line with a Program decision to keep the Elektron oxygen generator deactivated for power reasons while the ATV vehicle is docked to the ISS, the US OGS (Oxygen Generation System) was activated yesterday and subsequently started operating in 25% production mode with day/night cycling enabled (i.e., producing about 3 lb/day of O_2). The mode will be increased when more power becomes available.

Columbus Update: This morning ground engineers performed Run 1 of a planned COL Air Loop Thermal Checkout. During the checkout, the Columbus temperature was expected to increase somewhat, and the crew was advised to minimize their time in the module.

ATV Update: The scheduled ATV1 thruster test was successfully conducted on 4/5 (Saturday). After the handover to USOS CMG momentum management at the completion of the test, the vehicle momentum peaked at approximately 97% (of full capability) during SARJ (Solar Alpha Rotary Joint) and BGA (Beta Gimbal Angle) rotations. This is an expected occurrence due to the increased mass and inertia of the vehicle. Mitigating procedures have been instituted to minimize the momentum during these operations. Following yesterday's undocking of Progress 28P, and after the ATV transitioned to Standard Mode 2, the ATV solar arrays went prematurely into Autotrack. TsUP confirmed that neither they nor the crew had sent commands to "Jules Verne" that would have caused the arrays to switch to Autotrack. Ground teams are analyzing.

CEO photo targets uplinked for today were **Calcutta, India** *(looking right on the Hooghly River, one of the distributaries of the Ganges Delta, for this urban area of ~14 million people, focusing on city margins),* **East Haruj Megafans, Libya** *(a detailed swath of overlapping images looking just right of track was requested: remote sensing is a powerful way to collect data on these remote features. Understanding the way recently recognized extensive networks of desert streams are functioning [where there are no hillsides to channel them] is a new branch of research. This research has special application to ongoing research on Mars [e.g. for understanding the enigmatic flat plains in the Meridian region where the rover Opportunity still functions]),* **Pilcomayo River dynamics, N Argentina** *(the Pilcomayo River has built the largest inland delta [megafan] on Earth. It is also unusual because at present it stops flowing not far from the Andes Mt front—i.e. water and sediment fail to reach the sea, even though this is a major regional river. The cause may be tectonic subsidence. The crew was asked to shoot detailed images as far out onto the plains as the river stretches),* **Lima, Peru** *(looking a touch right for the capital city Lima [a short distance inland] and its port Callao, with a combined population of 7.5 million. Images of the margins of the cities were requested), East Venezuela land use (a swath of overlapping images close to nadir was to document new farming expansions in a part of the world which has been untouched until recently),* **Mississippi Delta Region** *(a mapping swath along track was to document ecological changes since Hurricane Katrina's passage in August 2005),* and **Sky Island Forests, Sierra Madre, Mexico/SW USA** *(the higher elevations of mountains in Mexico's Sierra Madre ranges and the US Southwest are cool and moist enough for thick pine-oak forest to flourish. The forested peaks appear as green "islands" in the deserts mainly of northern Mexico, but also in the US Southwest. The sky islands boast some of the richest biodiversity anywhere in North America. To start this round of change documentation researchers requested broad views looking right of track).*

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the

Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:51am EDT [= epoch]):*
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Perigee height -- 337.9 km
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Eccentricity -- 0.0000609
Solar Beta Angle -- 4.2 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 263 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53752

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~9:02am
04/12/08 -- **Cosmonautics Day**, with **Yuri's Night** (check out http://www.yurisnight.net/2008/)
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4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/07/08
Date:	Monday, April 07, 2008 3:05:59 PM
Attachments:	

ISS On-Orbit Status 04/07/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 25 of Increment 16.*

This morning at 4:49am EDT, Progress M-63/28P successfully undocked from the ISS. All separation burns went off nominally, and the deorbit burn followed at 7:50am for destructive reentry over the Pacific Ocean. This freed the DC1 Docking Compartment port for Soyuz TMA-12/16S docking on 4/10 at ~9:02am. *[For the undocking, ISS attitude control was handed over to Russian MCS (Motion Control System) at ~2:55am and returned to U.S. momentum management at ~5:45am, still in earth-fixed LVLH (local vertical/local horizontal). During the undocking, the station was in free drift for ~9 min. Structural response data were taken by MAMS (Microgravity Acceleration Measuring System) and the external truss-mounted SDMS (Structural Dynamic Measurement System). The undocking was preceded at ~4:15am by a temporary shutdown of the amateur radio equipment in the FGB (Ericsson) & SM (Kenwood) to prevent radiofrequency interference with the departing Progress vehicle.]*

After the separation, FE-1 Malenchenko took the usual NIKON D2X w/80-400mm lens photographs of the receding cargo ship's docking assembly (from ~8-40 m distance) to verify that no rubber seals are missing on the DC1 docking interface and to assess seal integrity.

Malenchenko and CDR Whitson worked their way through the Soyuz descent drill, a standard preparatory training for every crew returning on a Soyuz. For the exercise, Yuri and Peggy spent two hours in the SM, tagging up with an instructor at TsUP-Moscow to discuss procedures. *[The session included a review of the pertinent RODFs (Russian Ops Data Files), specifically the books on Soyuz Ascent & Descent Procedures, Emergency Descents, and Off-Nominal Situations, crew responsibilities when executing the flight program, visual crew recognition of SUS (Entry Control System) failures, contingency transition to manual entry control*

(RUS), etc. The training uses a Descent Simulator application on the RSK1 laptop. During the actual descent, Malenchenko as Soyuz CDR will occupy the middle couch, with So-yeon Yi in the right seat and Whitson in the Descent Module's left Kazbek couch. Pending the final State Commission decision at about 3.5h before undocking, 16S return is expected for 4/19, with undocking at 11:34pm EDT on 4/18 and landing near Arkalyk/Kazakhstan at ~2:52am EDT (12:52pm Kazakhstan time) on 4/19.]

Afterwards, the CDR and FE-1 tried on their KENTAVR suits for a fit check, supported by tagup with specialists (S-band). *[The Kentavr ("Centaur") garment is a protective anti-g suit ensemble to facilitate the return of a long-duration crewmember into the Earth gravity. Consisting of shorts, gaiters, underpants, jersey and socks, it acts as countermeasure for circulatory disturbance, prevents crewmember from overloading during descent and increases orthostatic tolerance during post-flight adaptation. Russian crewmembers are also advised to ingest fluid-electrolyte additives, viz., three sodium chloride tablets during breakfast and after the midday meal, each time with 300 ml of fluid, and two pills during the meal aboard Soyuz before deorbit.]*

Whitson & Malenchenko also took their pre-descent PMC (Private Medical Conference) via S- & Ku-band audio/video.

As Yuri conferred via S-band with ground specialists regarding Soyuz TMA-11/15S loading with return cargo, Reisman & Whitson made preparations for upcoming cargo transfer operations from the newly arrived ATV1 "Jules Verne". *[Preparations inside the ATV included installation of a TSR (Temporary Stowage Rack) at loc. ATV1D1, building a "bungee jail" holding place for cargo, relocating stowage bags and adapter plates from rack fronts to the "jail", and installing handrails.]*

Later, Malenchenko closed the DC1-to-Soyuz PEV (Pressure Equalization Valve; Russian: KVD) and uninstalled good lighting fixtures from the Soyuz Orbital Module (BO) to be kept as spares for the SM. *[The BO will be separated and discarded along with the Instrumentation/Propulsion Module prior to atmospheric entry.]*

The FE-1 also transferred a second set of Russian hand controllers, one for rotation (RUO), the other for translation (RUD), from the Soyuz to the FGB for stowage in the PILOT experiment container.

In the JLP (Japanese Experiment Module Experiment Logistics Module Pressurized Section), Garrett Reisman performed the periodic checkup on JLP status and shell temperatures by using the MKAM (Minimum Keep Alive Monitor).

After activating the MSG (Microgravity Science Glovebox) facility, the FE-2 continued troubleshooting the EMCS (European Modular Cultivation System) and succeeded in clearing up the problem by determining that the EMCS main door was obstructed by an EMCS laptop cable. Garrett also straightened out a crimped water line. EMCS was activated, and hydration of the Japanese CW/RW (Cell Wall/Resist Wall) experiment began. *[CW/RW operates in the EMCS facility in eight special ECs (Experiment Containers) which Garrett recently (3/30) installed on the centrifuges of the facility. The EMCS rack contains two rotating centrifuges that can support a wide range of small plant & animal experiments under partial gravity conditions. On Rotor A, the new ECs for CW/RW are EC92 in position A1, EC95 at A2, EC94 at A3, EC96 at A4, on Rotor B - EC97 in position B1, EC99 at B2, EC98 at B3, and EC100 at B4.]*

In the Lab, Reisman performed IFM (Inflight Maintenance) on the OGS (Oxygen Generation System). *[Garrett accessed it in its rack, replaced its H_2 (hydrogen) sensor with a new sensor, mated its electrical connections and hooked up the QD (Quick Disconnect) between the O_2 outlet hose and the N_2 (nitrogen) purge unit. Then, after the OGS was powered for 20 min, the FE-2 reconnected the H_2 sensor hose QDs, closed the rack door afterwards and turned on the WDS (Water Delivery System). Like the Russian Elektron, OGS produces O_2 from water by electrolysis, dumping the also generated H_2 through venting.]*

Whitson conducted the periodic atmospheric sampling in the center of the Lab, SM and JLP with the GSC (Grab Sample Container), while Malenchenko used the AK-1M adsorber to collect cabin air samples in the SM and FGB.

Later, Yuri prepared the IPD Draeger tube kits with their accumulated air samples for stowage on Soyuz 15S and return to Earth.

Malenchenko also conducted the periodic (monthly) functional closure test of the Vozdukh CO_2 removal system's spare emergency vacuum valves (AVK), in the spare parts kit. *[The AVKs are critical because they close the Vozdukh's vacuum access lines in the event of a malfunction in the regular vacuum valves (BVK) or a depressurization in the Vozdukh valve panel (BOA). Access to vacuum is required to vent CO_2 during the regeneration of the absorbent cartridges (PP). During nominal operation, the AVK valves remain open.]*

Reisman downloaded the structural dynamics data collected this morning during Progress undocking by the IWIS (Internal Wireless Integrated System) from the

RSUs (Remote Sensor Units) and NCU (Network Control Unit) to the SSC (Station Support Computer) laptop for subsequent downlink to the ground.

Yuri collected microbial samples of himself for the ESA/Russian experiment SAMPLE (Study of Microbial Communities Exposed to Weightlessness) with objectives similar to the US SWAB experiment. The samples were inserted in the MELFI (Minus-Eighty Laboratory Freezer for ISS), Dewar 4, Tray B/Section 3. *[Sampling will also include key areas of the ISS (switches, keyboards, personal hygiene equipment, etc) which will help determine what types of microbial species are present on ISS and how they adapt or mutate in space.]*

Peggy & Yuri spent about an hour each on end-of-increment cleanup and departure preparations. *[Instructions on packing of return items and a keep vs. trash list were uplinked for assisting Yuri and Peggy in their preparing for their return in the severely downmass-limited Soyuz Descent Module. Trashed items are being stowed in the Orbital Module (BO), to be separated along with the Instrumentation/ Propulsion Module prior to atmospheric entry.]*

Garrett Reisman had another 60 minutes for himself for general orientation (station familiarization & acclimatization) as is standard daily rule for the first two weeks after starting station residency.

The FE-2 performed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV at the SKV-2 air conditioner for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Working off the discretionary “time permitting” task list, Yuri –

- conducted the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur),
- performed the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder), and
- serviced the BIO-5 Rasteniya-2 ("Plants-2") experiment, which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}), by monitoring the greenhouse, taking pictures and downloading them to

the ground.

The crewmembers performed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1/fulltime), and RED resistive exercise device (CDR, FE-2).

Afterwards, Whitson downloaded the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~10:45am EDT, FE-2 Reisman powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, and power supply) and at 10:50am conducted a ham radio exchange with students at Osnovna škola (Elementary School) in Pazin, Croatia. *[Elementary school Vladimir Nazor of Pazin is a school with more than hundred year's tradition, founded in 1890. It is one of the highest rated schools in this part of the country, with more than 1500 pupils. Robotics, electronics and ham radio activities are more popular every day, with pupils achieving awards in national competitions. Astronomy is one of the latest after-school activities, which combined with existing ham radio activities resulted in applying for the ISS school contact. Questions to Garrett were uplinked beforehand. "When you were in space for the first time, how old were you?"; "How long does it take from Earth to ISS?"; "Were you afraid of going to ISS?"; "What is the most frightening in space?"; "Is it boring in space sometimes?"; "How do you shower?"]*

Elektron Update: RSC-Energia has completed the final procedures for activating the Elektron without the ATV power/noise (EMI) filter and has delivered it to ESA for review.

Columbus Update: A replacement delta-P sensor for redundancy in the COL water loops will be manifested soon. Troubleshooting of the COL condensate water separator blockage is in work with NASA. An open loop command was sent to the SOLAR payload which is a major step in recovering the payload; the system can now operate on a fixed position to track the sun. BLB (Biolab) troubleshooting will require removal & replacement of the locking pin; the pin is requested to be manifested on Flight 1J. ESA is completing procedures for the FSL (Fluid Science Laboratory) laser switch checkout; planners will work on when to schedule the activity.

No CEO (Crew Earth Observation) photo targets uplinked for today..

CEO photography can be studied at this “Gateway” website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this noon, 12:23pm EDT [= epoch]):*
Mean altitude -- 338.6 km
Apogee height -- 339.1 km
Perigee height -- 338.0 km
Period -- 91.31 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0000831
Solar Beta Angle -- 8.7 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 115 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53740

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
04/08/08 -- Soyuz TMA-12/16S launch - 7:16am EDT *(CDR Sergei Volkov, FE Oleg Kononenko, SFP Yi So-yeon)*
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~9:02am
04/12/08 -- **Cosmonautics Day**, with **Yuri’s Night** (check out http://www.yurisnight.net/2008/)
04/18/08 -- Soyuz TMA-11/15S undocking (FGB nadir port, 11:34pm EDT)
04/19/08 -- Soyuz TMA-11/15S landing (2:52am EDT, 9:52am Moscow/DMT, 12:52pm Kazakhstan)
05/06/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch

10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/06/08
Date:	Sunday, April 06, 2008 5:08:20 PM
Attachments:	

ISS On-Orbit Status 04/06/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday -- off-duty day for CDR Whitson, FE-1 Malenchenko & FE-2 Reisman except for housekeeping and voluntary work. Ahead: Week 25 of Increment 16.*

Having passed Day 180 of her flight, Dr. Peggy Whitson ended her fourth session with the NASA/JSC experiment NUTRITION w/Repository by collecting a final urine sample upon wakeup for storage in the MELFI (Minus-Eighty Laboratory Freezer for ISS). The sampling kit was then stowed away. *[The current NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R +30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

Today FE-1 Malenchenko was the subject for the BRASLET experiment (SDTO/ Station Development Test Objective), holding still for his first ultrasound scanning session by Peggy as operator (for which Yuri had to abstain from caffeine 12 hrs prior to the scan session, heavy meals 4 hrs before and any food at all 2 hrs prior to the scan, plus no exercise 2 hours before and no liquids 30 mins before). Afterwards, Peggy powered down the HRF USN (Human Research Facility) Ultrasound, closed the Image Collector Software on the HRF PC, stowed the hardware and transferred still images from the still camera to the OpsLAN. *[The SDTO-17011 "Validation of On-Orbit Methodology for the Assessment of Cardiac Function and Changes in the Circulating Volume Using Ultrasound and Braslet-M Occlusion Cuffs (Braslet)" is a collaborative effort between NASA and the Russian FSA (Federal Space Agency), with the goal to establish a valid ultrasound*

methodology for assessing a number of aspects of central and peripheral hemodynamics and cardiovascular function, specifically in rapid changes in intravascular circulating volume. Braslet uses Braslet-M occlusion cuffs, i.e., the Russian-made operational countermeasure already pre-calibrated and available onboard for each ISS crewmember. Braslet employs multiple modes of ultrasound imaging and measurements, in combination with short-term application of Braslet-M occlusive cuffs and cardiopulmonary maneuvers (Valsalva, Mueller) to demonstrate and to evaluate the degree of changes in the circulating volume on orbit. This will be accomplished by performing echocardiographic examinations in multiple modes (including Tissue Doppler mode), ultrasound measurements of lower extremity venous and arterial vascular responses to Braslet-M device under nominal conditions and also during cardiopulmonary Mueller and Valsalva maneuvers. Identical measurements will be repeated without Braslet-M, with Braslet-M applied, and immediately after releasing the occlusion device.]

Afterwards, CDR Whitson retrieved USN error logs off the laptop, winding up troubleshooting of her earlier VolSci Ultrasound activities. The USN now is back in commission.

The crew conducted the regular weekly three-hour task of thorough house cleaning. *["Uborka", normally done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the Service Module (SM) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab. Additionally, as part of the weekly cleaning, Malenchenko performs an inspection of structural elements, cables and instruments behind SM panels for moisture.]*

As part of today's *uborka*, the crew replaced the four dust filters (PF1-4) in the SM, two dust filters (PS1, PS2) in the *Funktsionalnyi-Grusovoi Blok* (FGB) and cleaned the mesh screens of the FGB's central ventilation fans (TsV1 & TsV2), with the fans running.

Malenchenko performed the monthly 20-min. maintenance/servicing of the toilet facility (ASU), changing out replaceable ASU parts with new components, i.e., the urine receptacle (MP) and a filter insert (F-V). The old parts were discarded as trash.

The FE-1 conducted the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables and the weekly collection of the toilet flush (SP) counter and

water supply (SVO) readings for calldown to TsUP. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV at the SKV-2 air conditioner for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Yuri also gathered weekly data on total operating time & “On” durations of the Russian POTOK-150MK (150 micron) air filter unit of the SM’s SOGS air revitalization subsystem for reporting to TsUP.

CDR Whitson completed the periodic deployment of four passive FMK (Formaldehyde Monitoring Kit) sampling assemblies in the Lab (at P3, below CEVIS) and SM (at the most forward handrail, on panel 307) for two days, to catch any atmospheric formaldehyde on a collector substrate for subsequent analysis on the ground. *[Two monitors each are usually attached side by side, preferably in an orientation with their faces perpendicular to the direction of air flow.]*

At ~8:25am EDT, the crewmembers held their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP/Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

Whitson & Reisman had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-9 laptop), Peggy at 10:45am, Garrett at 12:25pm.

Working off the discretionary “time permitting” task list, Yuri conducted his second session of the ETD (Eye Tracking Device) experiment, which studies the coordination of eye and head movements in zero-G, i.e. the adaptation of the human vestibular (balance) system, and takes place in the DC-1’s central sphere. *[After its initial calibration with the calibrating unit, the experiment investigates horizontal eye and head movement coordination, measures Listing's plane, and determines the orientation of the vestibulo-ocular coordinate system, using five target marks on a visual target board on the EV-2 hatch on the horizontal plane. For the experiment, Yuri first had to check the setup of the left and right video cameras, then establish his most comfortable and stable body position relative to the visual target (60 cm for the first part of the experiment, 100 to 150 cm in parts two & three). Each step requires another prior calibration run, using visual target cues or the calibration unit.]*

Also from the task list, the FE-1 performed the regular daily checkup on the

Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder).

A third task list item for Malenchenko today was to service the BIO-5 Rasteniya-2 ("Plants-2") experiment, which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}), by monitoring the greenhouse, taking pictures and downloading them to the ground.

The crewmembers performed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

Before sleeptime, the CDR closed the protective shutters of the Lab science window in preparation for tomorrow morning's **undocking of Progress M-63/28P**. Separation of the cargo drone-turned-trash cash can from DC1 nadir port will take place at 4:50am EDT.

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:42am EDT [= epoch]):*
Mean altitude -- 338.7 km
Apogee height -- 339.5 km
Perigee height -- 337.8 km
Period -- 91.31 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0001252
Solar Beta Angle -- 13.2 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 120 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53721

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
04/07/08 -- Progress M-63/28P undocking (DC1), 4:50am
04/08/08 -- Soyuz TMA-12/16S launch - 7:16am EDT *(CDR Sergei Volkov, FE Oleg Kononenko, SFP Yi So-yeon)*

04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~9:02am
04/12/08 -- **Cosmonautics Day**, with **Yuri's Night** (check out http://www.yurisnight.net/2008/)
04/18/08 -- Soyuz TMA-11/15S undocking (FGB nadir port, 11:34pm EDT)
04/19/08 -- Soyuz TMA-11/15S landing (2:52am EDT, 9:52am Moscow/DMT, 12:52pm Kazakhstan)
05/06/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/05/08
Date:	Saturday, April 05, 2008 10:26:43 PM
Attachments:	

ISS On-Orbit Status 04/05/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – half-day off for CDR Whitson, FE-1 Malenchenko & FE-2 Reisman.*

Having passed Day 180 of her flight, Dr. Peggy Whitson began her fourth session with the NASA/JSC experiment NUTRITION w/Repository, for which she had to forego exercising and food intake for eight hours. Today's protocol consisted of two blood draws (for Serum & Heparin). Later, the CDR set up the equipment for the 24-hour urine collections which start with the first void early tomorrow morning and continue through Sunday morning. *[Acting as operator, CMO (Crew Medical Officer)Garrett Reisman performed phlebotomy on Peggy Whitson, i.e., drawing blood samples (from an arm vein) which was first allowed to coagulate in the Repository for 20-30 minutes, then spun in the HRF RC (Human Research Facility/ Refrigerated Centrifuge) and finally placed in MELFI (Minus-Eighty Laboratory Freezer for ISS). The RC was later powered off after a temperature reset to limit wear on the compressor, and cleaned. Background: NUTRITION is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight; this includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes. The Clinical Nutritional Assessment profile currently required on all U.S. Astronauts collects blood and urine samples preflight and postflight. NUTRITION expands this protocol by also capturing inflight samples and an additional postflight sample. Furthermore, additional measurements are included for samples from all sessions, including additional markers of bone metabolism, vitamin status, and hormone and oxidative stressor tests. The results will be used to better understand the impact of countermeasures (exercise and pharmaceuticals) on nutritional status and nutrient requirements. The Clinical Nutritional Assessment profile (MR016L), first started on two Mir crewmembers and then on all ISS US crews, nominally consists of two pre-flight and one post-flight analysis of nutritional status, as well as an in-flight assessment of dietary intake using the FFQ (Food Frequency Questionnaire). The*

current NUTRITION project expands MR016L testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]

To cover their subsequent ingress in the ATV1 "Jules Verne", CDR Whitson activated the VDS MPC (Video Distribution System/Multi-Purpose Converter) with its four downlinks to allow the ground to conduct HDTV (high-definition TV) playback and downlink operations. After the ATV activities the MPC was powered off again.

After opening the SM PrK (Service Module Transfer Compartment)-to-ATV vestibule hatches, Malenchenko and Whitson performed first "real" ingress in the European cargo module, which had its atmosphere "scrubbed" overnight since yesterday's partial ingress. *[Message from Flight Control: "ESA congratulates Peggy and Yuri for the ATV hatch opening today and thanks you for the very good news from your first ingress in ATV."]*

FE-2 Reisman prepared for the subsequent ATV1 thruster test by verifying that the protective shutters of the Lab science window were closed and setting up/ programming the IWIS (Internal Wireless Instrumentation System) with its NCUs (Network Control Units) and RSUs (Remote Sensor Units) for acquiring structural dynamics data during the thruster firing. Also activated during the thruster test was the externally mounted SDMS (Structural Dynamics Measuring System).

For the ATV thruster test, ISS attitude control authority was handed over to the Russian MCS (Motion Control System) at ~9:30am EDT. After the firing (~9:40am), attitude control was returned to US momentum management at ~10:20am.

FE-1 Malenchenko performed a final repress of the ISS cabin atmosphere with air from Progress 28P to adjust total pressure.

Russian thrusters were again disabled at ~10:55am for the removal & inspection of quick-disconnect screw clamps in the DC1-to-Progress 28P docking vestibule and closing of hatches in preparation for 28P undocking on 4/7 (4:49am).

These activities were performed by Yuri and Garrett in the usual sequence:

- Transferring remaining trash and discarded equipment for stowage in Progress,
- Reporting completion of trash loading to the ground for the final Go from TsUP/Moscow,
- Activating the cargo ship,
- Tearing down the ventilation air duct,

- Removing the threaded BZV QDs (quick disconnect screw clamps) of the SSVP docking & internal transfer system,
- Closing hatches between 28P and the transfer tunnel (PrK) to the DC1 after taking video of the mating surfaces/seals
- Conducting the one-hour vestibule leak check and
- Downlinking the video imagery of the SM/Progress hatch interface.

FE-2 Reisman worked on the EMCS (European Modular Cultivation System) to check out the various connections associated with the facility's water flow system. The Japanese CW/RW (Cell Wall/Resist Wall) experiment is not working as planned, and troubleshooting will hopefully find the root cause of this problem and get the plants watered and growing. *[CW/RW operates in the EMCS facility in eight special ECs (Experiment Containers) which Garrett recently (3/30) installed on the centrifuges of the facility. The EMCS rack contains two rotating centrifuges that can support a wide range of small plant & animal experiments under partial gravity conditions. On Rotor A, the new ECs for CW/RW are EC92 in position A1, EC95 at A2, EC94 at A3, EC96 at A4, on Rotor B - EC97 in position B1, EC99 at B2, EC98 at B3, and EC100 at B4. The removed ECs were stowed.]*

In preparation for his return to gravity, Yuri also undertook his second preliminary session of the Russian MO-5 MedOps protocol of cardiovascular evaluation in the "Chibis" below-the-waist reduced-pressure suit (ODNT, US: LBNP) on the VELO ergometer, assisted by Whitson as CMO (Crew Medical Officer). *[The 45-min assessment, supported by ground specialist tagup (VHF) and telemetry monitoring from Russian ground sites (at 7:03am EDT), uses the Gamma-1 ECG equipment with biomed harness, skin electrodes and a blood pressure and rheoplethysmograph cuff wired to the cycle ergometer's instrumentation panels. The Chibis ODNT provides gravity-simulating stress to the body's cardiovascular/ circulatory system for evaluation of Malenchenko's orthostatic tolerance (e.g., the Gauer-Henry reflex) after several weeks in zero-G. The preparatory training generally consists of first imbibing 150-200 milliliters of water or juice, followed by a sequence of progressive regimes of reduced ("negative") pressure, set at -20, -25, -30, and -35 mmHg (Torr) for five minutes each while shifting from foot to foot at 10-12 steps per minute, while wearing a sphygmomanometer to measure blood pressure. The body's circulatory system interprets the pressure differential between upper and lower body as a gravity-like force pulling the blood (and other liquids) down. Chibis data and biomed cardiovascular readings are recorded. The Chibis suit (not to be confused with the Russian "Pinguin" suit for spring-loaded body compression, or the "Kentavr" anti-g suit worn during reentry) is similar to the U.S. LBNP facility (not a suit) used for the first time on Skylab in 1973/74, although it appears to accomplish its purpose more quickly.]*

At ~7:35am, Yuri Malenchenko had his weekly PFC (Private Family Conference) via

S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-9 laptop).

The FE-1 also performed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV at the SKV-2 air conditioner for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

The crewmembers performed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-2, FE-1), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Peggy downloaded the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Columbus Update: All Columbus systems are running nominally. The WPA1 (Water Pump Assembly 1) to WPA2 switch-over conducted yesterday afternoon was successful. Columbus TCS (Thermal Control System) is now running on WPA2.

SLEEP Update: Peggy and Garrett were thanked for finishing off all the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment downloads for both. The Actiwatch was not stowed, leaving it for the upcoming South Korean (KARI) SFP.

Weekly Science Update (Expedition Sixteen -- Week 24)

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Radiation measurements continue to be performed in the DC1/PIRS module. Card replacement performed on 3/31. Photos were taken by the crew of potential ALTCRISS FGB location for Inc17.

ANITA: Completed.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): In progress.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Last session (4th) is currently planned just before Soyuz docked Ops.

EuTEF (European Technology Exposure Facility): In progress.

Fluid Science Laboratory (FSL): The FSL Facility is awaiting further troubleshooting after 1J/A departure.

GEOFLOW: Planned.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Second session is currently planned for 4/12 through 4/15.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: "Peggy, thank you for unstowing Garrett's saliva kit and having it ready for him to begin his collections. Garrett, we appreciate your efforts during your early increment Integrated Immune session."

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Complete.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION/REPOSITORY: “Garrett, thank you for your attention to detail in completing your FD15 Nutrition/Repository session within timeline constraints! We appreciate your efforts and participation.”

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SAMPLE: Last crew sampling session is currently planned for 4/7.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): “Peggy, thanks for downloading 1 J/A FE2 and your Actiwatches, as well as initializing the KARI SFP Actiwatch. You also completed your last targeted week of sleep logging. Your only remaining scheduled activity is downloading all three Actiwatches and doffing your and KARI SFP Actiwatches. Thanks for all your additional sleep logging. The PI greatly appreciates it.” “Garrett, you have competed your first two Sleep activities (Actiwatch Don and 1st download), and are in-process of completing your first week of sleep logging. Thanks for completing these activities. Any additional sleep logging is above and beyond, and the PI will greatly appreciate it.”

SOLAR (Solar Monitoring Observatory): Planned.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: “Peggy, thank you for moving and checking out the Ultrasound –

we were VERY excited to see if functioning nominally!"

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): Planned.

CEO (Crew Earth Observation): Through 4/1, the ground has received a total of 17,049 ISS CEO images for review and cataloging. Late this week imagery received included sessions with camera times corresponding to the following daily target requests: Lake Eyre, Australia; Patagonian Glaciers; Somalia Coast; Florida Coastal Everglades; Central Arizona-Phoenix; and Madrean Sky Islands, North America. We will be providing feedback on these acquisitions as we work through them in the coming week. This weekend your striking, oblique view of the rugged escarpments, ravines, and peaks of the Semien Mountains of northern Ethiopia will be published on NASA/GSFC's Earth Observatory site. Your perspective and illumination provides an excellent contextual view of this World Heritage Site."

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 11:43am EDT [= epoch]):*
Mean altitude -- 338.8 km
Apogee height -- 339.5 km
Perigee height -- 338.1 km
Period -- 91.31 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0000977
Solar Beta Angle -- 17.7 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 141 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53708

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
04/07/08 -- Progress M-63/28P undocking (DC1), 4:49am
04/08/08 -- Soyuz TMA-12/16S launch - 7:16am EDT *(CDR Sergei Volkov, FE Oleg Kononenko, SFP Yi So-yeon)*
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~9:02am
04/12/08 -- **Cosmonautics Day**, with **Yuri's Night** (check out http://www.yurisnight.net/2008/)
04/18/08 -- Soyuz TMA-11/15S undocking (FGB nadir port, 11:34pm EDT)

04/19/08 -- Soyuz TMA-11/15S landing (2:52am EDT, 9:52am Moscow/DMT, 12:52pm Kazakhstan)
05/06/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
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11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/04/08
Date:	Friday, April 04, 2008 8:40:57 PM
Attachments:	

ISS On-Orbit Status 04/04/08

All ISS systems continue to function nominally, except those noted previously or below.

After yesterday's successful ATV1 docking, CDR Whitson and FE-1 Malenchenko today performed first ingress of the European cargo carrier by executing a number of prescribed steps, viz.:

- Conducting a 30-min OBT (Onboard Training) procedures review for Docked ATV Operations,
- Completing a one-hour leak check of the SM PrK (Service Module Transfer Compartment)/ATV vestibule interface,
- Preparing the necessary equipment for the first ingress *[including GSC (Grab Sample Container), IPD-CO air sampler for CO (Carbon Monoxide), AK-1M air sampler, a manual sampling pump, goggles, a dusk mask, an A-2 air scrubber filter, etc.]*
- Donning the PPE (Personal Protective Equipment) i.e.,safety goggles, dust mask) *[keeping PPE on until after ATV closeout operations and egress]*,
- Opening the hatches for partial ingress (~6:20am EDT),
- Installing the QD BZV (quick disconnect screw clamps) of the SSVP docking & internal transfer mechanism to rigidize the coupling,
- Taking copious air samples from the ATV interior, and
- Starting the air scrubber, equipped with an FPP electronic/EMI interference filter, to run for about 8h 20m with hatches closed.

For the second ingress, scheduled tomorrow (Saturday, 4/5, at ~4:00am EDT), the air scrubbing in the ATV will make the PPE unnecessary. ATV1 will then be readily accessible to the crew for nominal operations. Also scheduled for tomorrow is an ATV thruster test.

FE-2 Reisman meanwhile set up the CSLM-2 (Coarsening in Solid-Liquid Mixtures-2) experiment in the MSG (Microgravity Science Glovebox), installing the ECU (Electronics Control Unit), first SPU (Sample Processing Unit) and SAMS RSU

(Space Acceleration Measurement System/Remote Sensor Unit) hardware in the MSG WV (work volume) and connecting CSLM-2 power & data cables to the MSG A31p laptop. The MSG Facility and the A31p were then powered down again. *[The CSLM-2 experiment will begin in approximately ten days.]*

In the US Lab, Peggy Whitson set up the hardware associated with urine and blood collections for her fourth & final session of NASA's NUTRITION w/Repository experiment, scheduled on his timeline tomorrow, requiring Peggy to start her mandatory 8-hr fasting tonight for the blood draw. *[The 24-hr urine sampling begins with the first void tomorrow morning and continues through the first void on Sunday morning. The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

In the COL (Columbus Orbital Laboratory), Garrett worked on the two VCAs (Video Camera Assemblies) to perform an adjustment on the VCA lens flange back. *[To verify the quality of the video image, the FE-2 used the VMN video monitors.].*

Reisman also performed troubleshooting on the COL delta-pressure sensor/Block 2 Columbus Delta Pressure Sensor Block 2, coordinate with COL-CC.

The FE-2 filled out the regular FFQ (Food Frequency Questionnaire), his third, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA/ESA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

To prepare for next week's (4/7) undocking of Progress M-63/28P, FE-1 Malenchenko dismantled and removed electronic equipment from the cargo ship, to be recycled. Removed were the US-21 matching unit, the cargo ship's LKT local temperature sensor commutator (TA251MB) of the BITS2-12 and its PZU-1M ROM (read-only memory) unit. *[When a Progress is undocked and jettisoned, the valuable electronics are retained, to be recycled on a future vehicle.]*

Completing preparations for Progress 28P undocking, FE-2 Reisman & CDR Whitson installed the StM Docking Mechanism between Progress and the DC1. *[StM is the "classic" probe-and-cone type, consisting of an active docking assembly (ASA) with a probe (SSh), which fits into the cone (SK) on the passive docking assembly (PSA) for initial soft dock and subsequent retraction to hard dock. The ASA is mounted on the Progress' cargo module (GrO), while the PSA sits on the docking ports of the SM, FGB and DC1.]*

Peggy Whitson conducted another CO_2 survey, using the CDMK (Carbon Dioxide Monitor Kit) to take CO_2 data. *[ppCO$_2$ measurements were 0.47 in COL, 0.47 in the Lab, and 0.47 in the SM. Purpose of the 15-min activity is to trend with MCA (Major Constituents Analyzer), i.e., to correlate the hand-held readings with MCA measurements.]*

Garrett worked in the Airlock, terminating the EMU battery discharge process on the second batch of two EMU batteries, #2066 & #2071. *[Discharging the second batch of 16V-batteries took about 27-30 hours. The full maintenance discharge, done manually in the early days of ISS ops, is handled automatically by an SSC laptop equipped with a special DOS application.]*

The FE-2 had another 60 minutes for himself for general orientation (station familiarization & acclimatization), as is standard daily rule for the first two weeks after starting station residency.

Peggy Whitson spent about an hour on end-of-increment cleanup and departure preparations. *[Instructions on packing of return items and a keep vs. trash list were uplinked for assisting Yuri and Peggy in their preparing for their return in the severely downmass-limited Soyuz Descent Module. Trashed items will be stowed in the Orbital Module, to be separated along with the Instrumentation/Propulsion Module prior to atmospheric entry.]*

Yuri performed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/ replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV at the SKV-2 air conditioner for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

The crewmembers performed their regular 2.5-hr. physical workout program (about

half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), and TVIS treadmill (CDR, FE-1/full time), RED resistive exercise device (CDR, FE-2).

Afterwards, Reisman downloaded the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~7:00am EDT, the FE-1 linked up with TsUP-Moscow stowage specialists via S-band to conduct the weekly IMS tagup, discussing stowage issues and equipment locations.

At ~7:15am, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~7:45am, the crewmembers will convene for their standard bi-weekly teleconference with the JSC Astronaut Office (Steve Lindsey), via S-band S/G-2 audio & phone patch.

SPDM Update: Robotics ground controllers powered up the RWS (Robotics Workstation) and SPDM (Special Purpose Dexterous Manipulator) to check out the body roll polarity software patch uplinked earlier this week. All operations were nominal and the patch successfully corrected the SPDM body roll polarity (+/-) issues raised during Flight 1J/A.

COL Update: Today COL ground teams performed a standard maintenance activity including a switchover from WPA1 (Water Pump Assembly 1) to WPA2. Since this was the first WPA switchover on orbit, there was a slight possibility for the water transfer to affect COL accumulator quantities and trigger a false ammonia (NH_3) leak alarm. For this reason, COL NH_3 leak monitoring was disabled during the switchover and the crew was prepared for NH_3 leak detection in the COL. All switchover operations were nominal.

CEO photo targets (for discretionary picture taking) uplinked for today were **Tigris-Euphrates Delta** *(a broad image was requested to show the context of the numerous, detailed images already acquired of offshore sand bars and islands),* **Galapagos Islands, E. Pacific** *(Dynamic event. Looking right of track for this archipelago of desertic islands. In the present weak La Niña phase, rainfall is*

depressed even below that of the normally dry climate. The crew was to document the islands for vegetation status [generalized color of the volcano flanks]), and **Volcán Colima, Mexico** *(although CEO researchers have good 400-mm images, no 800-mm shots of Colima's summit exist. The Colima volcanic complex consists of two volcanoes, the 3850-m-high historically active Volcán de Colima at the south, the volcano of interest; and Nevado de Colima, the 4320-m high point of the complex, in the north. Volcán de Colima is a youthful stratovolcano constructed within a 5-km-wide caldera. Occasional major explosive eruptions [most recently in 1913] have destroyed the summit and left a deep, steep-sided crater—subsequently slowly refilled and then overtopped by the growth of a lava dome)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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Perigee height -- 338.4 km
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Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0000782
Solar Beta Angle -- 22.2 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 121 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53692

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04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~9:02am
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05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)

05/31/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
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05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

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http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/03/08
Date:	Thursday, April 03, 2008 4:15:21 PM
Attachments:	

ISS On-Orbit Status 04/03/08

All ISS systems continue to function nominally, except those noted previously or below.

ATV1 "Jules Verne" docked successfully at the SM (Service Module) aft port at 10:45am EDT. SM hooks were closed at 10:56am. The docking was essentially a repeat of Demo Day 2 except for the final approach from S41 (~12m) to Contact and Hooks Closed. *[The 19-ton unmanned ATV maneuvered from a holding position 39 km behind the ISS and conducted a 4-hour staged approach with several stops at reference points for checks. It autonomously computed its own position through relative GPS (Global Positioning System) data, comparing with GPS data received from ISS, and in close range it used VDM (Videometer) lasers pointed at LRRs (Laser Retroreflektors) on the SM for distance & orientation determination relative to its target. Final approach was at a relative velocity of 7 cm/s and with an accuracy of better than 10 cm. The cargo transport, which remains docked for the next four months, is delivering 1,150 kg of dry cargo, including food, clothes and equipment as well as two original manuscripts handwritten by Jules Verne and a 19th Century illustrated edition of his novel "From the Earth to the Moon". The cargo also includes 856 kg of propellant, 270 kg of drinking water and 21 kg of oxygen, to be transferred to the SM.]*

From the US voluntary "job jar" task list, after wakeup and before breakfast, CDR Whitson & FE-2 Reisman downloaded the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data from their Actiwatches to the HRF-1 (Human Research Facility 1) laptop. Yi So-yeon, the South Korean SFP (Space Flight Participant), will participate in the experiment. *[To monitor the crewmember's sleep/wake patterns and light exposure, crewmembers wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

In preparation for the automatic ATV docking the crew went about repeating the steps executed for Demo Day 2, plus standing by for the final linkup, controlled from TsUP-Moscow:

- Verification of the powerdown of onboard ham radio equipment (Kenwood in SM & Ericsson in FGB) to prevent RF interference with the ATV,
- Closing of the protective Lab science window shutter (to be reopened at or about 3:15pm),
- Setting up the KL-154 “Klest” television equipment in the SM with the ATV TV control console (BRTK-PU),
- configuring the designated A31p laptop in the FGB for transmitting analog & digital video of the activities from the RS (Russian Segment) from the MPEG-2 (Moving Pictures Expert Group 2) encoder, downlinked via U.S. OpsLAN and Ku-band in “streaming video” packets,
- Activating and testing the SM’s MBRL/PCE (Proximity Communications Equipment) Space-to-Space Radio hardware of the ASN-M satellite navigation system, then
- Monitoring the approach, station-keeping and subsequent closing-in maneuver of the automated ATV1 to hard dock.

Structural dynamics data of the docking event were taken with the external SMDS (Structural Dynamics Measurement System) and the IWIS (Internal Wireless Instrumentation System), with RSUs (Remote Sensing Units) deployed in SM (#1027), FGB (#1035), Lab, Node-1, and Node-2.

Later, the IWIS data were downloaded to SSC (Station Support Computer), to be downlinked to the ground.

Whitson also deactivated the A31p and the MPEG-2 streaming video setup via OpsLAN.

The CDR & FE-1 had half an hour each for their end-of-increment cleanup and departure preparations. *[Instructions on packing of return items and a keep vs. trash list were uplinked for assisting Yuri and Peggy in their preparing for their return in the severely downmass-limited Soyuz Descent Module. Trashed items will be stowed in the Orbital Module, to be separated along with the Instrumentation/ Propulsion Module prior to atmospheric entry.]*

FE-2 Reisman conducted the periodic (every two weeks) inspection of the RED (Resistive Exercise Device) canister bolts for re-tightening if required. Garrett then performed major IFM (In-flight Maintenance) on the RED, by replacing canister pulley cables (done after every 53,515 cycles, based on life cycle testing results & safety controls), afterwards concluding with the standard Flexpac canister load calibration as required after cable replacements. (Last time done: 12/26/07).

[Cables are replaced periodically after ground analysis shows cable life has expired. Garrett's on-orbit calibration of the Schwinn RED cans re-established the relationship of specific load settings with a specific number of pulls per setting, followed by recording of the load values measured with a calibration tool and steel handles from the on-orbit calibration kit.]

The CDR conducted the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week.]*

To familiarize himself with upcoming CSLM (Coarsening in Solid-Liquid Mixtures), Reisman reviewed crew procedures and training materials for the CSLM-2 experiment.

The FE-2 also continued EMU battery maintenance in the US Airlock, terminating the discharge process on the first batch of two EMU batteries, #2070 & #2065, and initiating it on the second set, #2066 & #2071. *[Discharging the second batch of 16V-batteries takes about 27-30 hours. The full maintenance discharge, done manually in the early days of ISS ops, is handled automatically by an SSC laptop equipped with a special DOS application.]*

Yuri Malenchenko worked with the ground on activating of the Elektron oxygen generator at 32 amps, first pressurizing the BZh Liquid Unit with N_2 (nitrogen) via laptop and later monitoring the external temperature of its secondary purification unit (BD) for the first 10 minutes of operations to ensure that there was no overheating. The Elektron had been turned off by the ground for the ATV docking (for onboard power balance). *[During nominal operations a gas analyzer is utilized to detect hydrogen (H_2) in the O_2 line (which could cause overheating) but is not included in the control algorithm until 10 minutes after Elektron startup. A new EMI filter, installed on 2/9 on the Elektron's current stabilizer (FPP ST-64), was to prevent RFI (radio frequency interference) with the ATV, but when Yuri reported it to be unusually hot to the touch after yesterday's Elektron activation, he was asked to remove it and turn Elektron back on. It worked nominally. Since there are no spare FPP filters on orbit, the ground opted for turning Elektron off for the docking.]*

The FE-2 had another 60 minutes for himself for general orientation (station familiarization & acclimatization), as is standard daily rule for the first two weeks after starting station residency.

The crewmembers performed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS

cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Reisman downloaded the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Yuri performed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/ replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV at the SKV-2 air conditioner for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

ATV Update (Flight Day 26): For today's successful rendezvous & docking, the ATV performed the following 13 maneuvers, all of which were reported to be nominal:

- TV1: 10:47:27pm EDT on 4/2; delta-V: 2.56 m/s
- TV2: 11:32:36pm on 4/2; delta-V: 2.64 m/s
- IF1: 4:52:57am on 4/3; delta-V: 0.39 m/s
- IF2: 5:38:49am; delta-V: 0.03 m/s
- IF3: 6:22:57am; delta-V: 1.54 m/s
- HM1: 7:18:25am; delta-V: 1.61 m/s
- HM2: 7:33:54am; delta-V: 0.32 m/s
- HM3: 7:49:24am; delta-V: 0.41 m/s
- HM4: 7:54:54am; delta-V: 2.135 m/s
- CM1: 8:36:05am; delta-V: 1.46 m/s
- CM2: 8:49:05am; delta-V: 0.36 m/s
- CM3: 9:02:05am; delta-V: 0.32 m/s
- CM4: 9:09:25am;

The ATV performed a nominal automated rendezvous and docking. Contact and capture to the SM aft port occurred at 10:45:21am and 10:45:22am, respectively. ATV hooks were closed at 10:52:41am. SM hooks were reported to be closed at 10:56.

CEO photo targets (for discretionary picture taking) uplinked for today were **Betsiboka River delta, Madagascar** *(Dynamic event. This long term monitoring site is usually cloud covered. As ISS tracked along the coast of Madagascar, the crew was to look right for one of the largest estuaries. Thirty-five of the 55-km length of the estuary has been filled with sediment since World War II--due to very widespread deforestation and consequent soil erosion inland. New islands*

continue to form in the estuary. Handheld imagery has shown that all downstream islands have grown seaward since the first Space Shuttle flight), **Teide Volcano, Canary Islands** *(looking left of track for detailed images of this complex volcano, which makes the island of Tenerife, the largest island looking left of track [the track passed over two other islands in the chain]. Detailed images from different angles allow scientists to collect new data on the morphology of the crater and its lava flows. Looking for dust in the area. Two minutes later the crew had a nadir view of the Strait of Gibraltar, where internal waves could have been visible),* and **Panama Canal** *(Dynamic Event. Clear weather in one of the cloudiest parts of the world may have allowed views of the Canal Zone, notable as a swath of country which retains some original stands of natural rain forest. The decrease in the size of the forest is the main point of interest in this long term monitoring site).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 11:33am EDT [= epoch]):*
Mean altitude -- 339.1 km
Apogee height -- 339.7 km
Perigee height -- 338.4 km
Period -- 91.32 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0000917
Solar Beta Angle -- 26.6 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 135 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53676

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
04/07/08 -- Progress M-63/28P undocking (DC1), 4:49am
04/08/08 -- Soyuz TMA-12/16S launch - 7:16am EDT *(CDR Sergei Volkov, FE Oleg Kononenko, SFP Yi So-yeon)*
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~9:02am
04/12/08 -- **Cosmonautics Day**, with **Yuri's Night** (check out http://www.yurisnight.net/2008/)
04/18/08 -- Soyuz TMA-11/15S undocking (FGB nadir port, 11:34pm EDT)
04/19/08 -- Soyuz TMA-11/15S landing (2:52am EDT, 9:52am Moscow/DMT, 12:52pm Kazakhstan)
05/06/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)

05/31/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/02/08
Date:	Wednesday, April 02, 2008 1:31:34 PM
Attachments:	

ISS On-Orbit Status 04/02/08

All ISS systems continue to function nominally, except those noted previously or below.

From the US voluntary "job jar" task list, after wakeup and before breakfast, CDR Whitson & FE-2 Reisman downloaded the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data from their Actiwatches to the HRF-1 (Human Research Facility 1) laptop. Yi So-yeon, the South Korean SFP (Space Flight Participant), will participate in the experiment. *[To monitor the crewmember's sleep/wake patterns and light exposure, crewmembers wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

Also upon wake-up, CDR Whitson started Part 2 (of 5) of the periodic acoustic measurement protocol by recording post-sleep data of the crew-worn acoustic dosimeters, later deploying the dosimeters statically in Node-2, COL (Columbus Orbital Laboratory), and SM (Service Module) near the Central Post for the duration of the day. *[Acoustic data must be taken twice per Increment, each time for the duration of the 16-hour crew workday.]*

FE-1 Malenchenko collected surface samples for microbial analysis from numerous locations in the FGB module. The test tubes were then stowed in Kit #297 for return on Soyuz TMA-11/15S. *[The FGB hygiene station is currently suspected as the source of water contamination with Wautersia bacteria.]*

Yuri also broke out the Biosamples Kit A2 of the Russian BTKh-11 Biodegradation ("Biodegradatsiya") experiment and conducted the periodic collecting of surface samples from specific equipment and structures in the station, for subsequent stowage in the Soyuz 15S Descent Module for microbial analysis on Earth. The activity was documented with the Nikon D1X digital camera with SB 28DX flash attachment.

FE-2 Reisman checked out the U.S. SLM (Sound Level Meter) instrument and then used it to conduct the periodic noise level measurements program in the station interior for a 2-hr acoustic survey, including transfer of the recorded data to the MEC (Medical Equipment Computer). *[A total of 39 acoustic measurements were obtained at 13 locations in the Lab, six locations in Node-2, 11 locations in the SM, and seven locations in the COL (Columbus Orbital Laboratory). The survey also includes two crew preference locations taken at their perceived loudest locations in the station. The SLM gives instantaneous noise levels and their frequency spectra, which are transferred to the MEC laptop via an RS232 cable and later downlinked with regular CHeCS (Crew Health Care Systems) data dump or via OCA.]*

In the SM, Malenchenko took the periodic readings of potentially harmful atmospheric contaminants with the CMS (Countermeasure System) part of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, which uses preprogrammed microchips to measure H_2CO (Formaldehyde, methanal), CO (Carbon Monoxide) and NH_3 (Ammonia), taking one measurement per microchip.

Afterwards, Yuri Ivanovich also completed the 2.5-hr Part 2 of his second onboard "Profilaktika" (MBI-8, "Countermeasures") series of preventive health maintenance fitness testing, including ECG (Electrocardiogram), blood test and subjective rating. *[Today's fitness test was performed on the TVIS treadmill in unmotorized (idle) mode, with free choice of speeds within the range permitted. The test investigates the action mechanism and efficiency of various countermeasures (currently VELO and TVIS) aimed at preventing locomotor system disorders in weightlessness. The test differs from the normal TVIS session by the use of the TEEM-100 gas analyzer (via a mask equipped with a pneumotachometer sensor), measurement of blood lactate level and subjective evaluation of physical exertion levels during the test. The lactate blood samples were taken twice at the end of the session, using the ACCUSPORT analyzer and REFLOTRON-4 accessories. Results were entered on a log sheet. TEEM and ECG (electrocardiograph) data were transferred to the RSE-Med laptop, also on a tape cassette (Cardiocassette-2000), and prepared for later downlink via Regul-Packet comm. The TEEM-100M kit was packed for stowage for use by Expedition 17, and the Profilaktika data kit was stowed in Soyuz 15S for return.]*

At ~7:00am EDT, CDR Whitson closed the Lab science window shutter as protection from thruster effluents, before TsUP/Moscow commanded the propellant line purge of Progress M-63/28P at the DC1 in preparation for its undocking next Monday (4/7; 4:49am). The shutter was reopened after ~12:55pm, i.e., several orbits later to let the vent cloud disperse in the space vacuum. *[ISS attitude control authority was handed over to Russian MCS (Motion Control System) thrusters at*

7:25am to keep the attitude stable during the venting, and was returned to US momentum management at ~9:50am.]

The CDR worked in the COL, completing the checkout of the MSG (Microgravity Science Glovebox) which was relocated from the US Lab to COL (loc. COL1F2) on 3/22, followed on 3/23 by having its power, data & fluid connectors mated and the rack activated. *[Later, the MSG ground team afterwards started sending extensive commanding during a period of two to three hours in order to verify video & data connections. Afterwards, Peggy was to power down the MSG facility.]*

In the Lab, Whitson cleared stowed equipment from the front of portside racks to allow rotation of the LAB1S6 rack for a subsequent IFM (Inflight Maintenance) on the MTL (Moderate Temperature Loop) RFCA (Rack Flow Control Assembly) of Node-1, which is located in the Lab. After the RFCAs were swapped, both were powered nominally with no RPC (Remote Power Controller) trips. Subsequently, the racks were to be rotated back and the equipment restowed in front of them. *[Peggy replaced the RFCA with the LTL (Low Temperature Loop) RFCA from Node-2, a two-hour activity. Swapping the RFCAs should help determine whether there is a problem with the MTL RFCA itself, which had suffered an RPC overcurrent trip on 2/24.]*

FE-1 Malenchenko unstowed a Progress M-61 (26P)-delivered (EDV-OR container with disinfectant, set up the pumping equipment and initiated (later closed out) the transfer of all of the disinfectant solution to the SM's Rodnik BV1 tank.

The FE-1 and CDR again had an hour each for their end-of-increment cleanup and departure preparations. *[Instructions on packing of return items and a keep vs. trash list were uplinked for assisting Yuri and Peggy in their preparing for their return in the severely downmass-limited Soyuz Descent Module. Trashed items will be stowed in the Orbital Module, to be separated along with the Instrumentation/ Propulsion Module prior to atmospheric entry.]*

For the benefit of the new US flight engineer, CDR Whitson & FE-2 Reisman, with Malenchenko assisting part-time, went through the mandatory 60-min Emergency Event OBT (Onboard Training) drill for new crewmembers, for the case of rapid cabin depressurization or fire. Russian and US experts stood by at both control centers for consultation. The rule is that the Russian-led emergency exercise should be performed by every new station crewmember once within seven days after departure of the previous crew. *[Background: Purpose of the drill for new station residents is to (a) familiarize them with the location of hardware and the positions of valves used in emergency situations, (b) familiarize them with the translation routes to the Soyuz vehicle, (c) work through the Russian Segment (RS) hardware deactivation procedures, (d) familiarize them with the particulars of the*

scenario and the results of the previous US Segment (USOS) fire drill, and (d) practice crew interactions in emergency situations. Referring to EMER book crew procedures, first Peggy and Garrett translated along the emergency egress path to the FGB nadir port (where Soyuz TMA-11 is currently docked), checking hardware such as the Sokol suits, cable cutters, fire extinguisher (OKR), gas masks (IPK), emergency procedures books, valve settings, hatch rubber seal & restraint integrity, etc. In the USOS the inspection focused on fireports in the Lab, Node and Airlock, readiness of CSA-CP (Compound Specific Analyzer-Combustion Products), ISS leak kit, PBAs (portable breathing assemblies) and PFEs (portable fire extinguishers), emergency procedures books, valve settings, integrity of hatch rubber seals, presence of hatch handrails, etc. The exercise was topped off by a thorough debrief with the ground via S-band. During the session, the crew simulated executing the planned emergency procedures while moving about the station. For the case of an onboard fire and for emergency descent, there are other mandatory emergency drill OBTs.]

The FE-2 performed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV at the SKV-2 air conditioner for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Afterwards, Reisman performed the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various station hatchways, including the FGB-to-Soyuz tunnel, and the FGB-to-Node1 passageway.

The FE-2 also continued EMU battery maintenance in the US Airlock, starting the discharge process on two EMU batteries, #2070 & #2065. *[Discharging the 16V-batteries takes about 12-15 hours. The full maintenance discharge, done manually in the early days of ISS ops, is handled automatically by an SSC laptop equipped with a special DOS application.]*

Peggy conducted the periodic checkup on active U.S. payloads, i.e., cleaning the ANITA (Analyzing Interferometer for Ambient Air) inlet plus inspecting and filter cleaning of the CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) incubator payload. *[The CGBA incubator is controlled from the ground, with automatic video downlinked to Earth. ANITA continues to collect data every six seconds and downlinks the data daily to the ground team. ANITA monitors low levels of potential gaseous contaminants in the ISS cabin atmosphere with a capability of simultaneously monitoring 32 gaseous contaminants. The experiment is testing the accuracy and reliability of this technology as a potential next-*

generation atmosphere trace-gas monitoring system for ISS and future spacecraft. This is a cooperative investigation with ESA.]

Working off the discretionary "time permitting" task list, Yuri –

- conducted the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur),
- performed the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder), and
- serviced the BIO-5 Rasteniya-2 ("Plants-2") experiment, which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}), by monitoring the greenhouse, taking pictures and downloading them to the ground.

The crewmembers performed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Garrett downloaded the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

The FE-2 had another 60 minutes for himself for general orientation (station familiarization & acclimatization), as is standard daily rule for the first two weeks after starting station residency.

At ~10:30am EDT, Yuri Malenchenko supported a PAO TV "Telebridge" event, during which he participated in the taping of a TV show called "I Trust, I Love, I Hope" for Cosmonautics Day (4/12) at the House of Officers in Moscow (Suvorov Square). *[This is a new monthly show being broadcast on the Zvezda TV Channel, dedicated this year to the family: Year 2008 was declared Family Year in Russia, and show attendance were officers and their families, military "dynasties", and Yuri Malenchenko's spouse, Ekaterina. Some subjects for discussion between "Showmaster" Yulia Menshova, Ekaterina and Yuri: "How is your daughter growing?", "Yuri's Welcome Back party", "Where does Yuri want to go with his family after his return?", "How is work structured on the station? Do you have days off, holidays?"]*

PEP Update: As a result of Reisman's PEP (Portable Emergency Provisions) inspection on 3/31, the crew reported one of the PBA (Portable Breathing Apparatus) bottles (#1014, in the Airlock) showing its pressure gauge in the red zone, i.e., the bottle has become unusable. A replacement is being manifested on the ground.

CDRA Update: The troubleshooting of the Carbon Dioxide Removal Assembly on 3/28 yielded no blockage on the Return duct which could have caused the dP anomaly. More troubleshooting plans are under development.

SSRMS Update: The uploading of the software patch for two SPDM (Special Purpose Dexterous Manipulator) configuration files (to correct the body roll polarity [+/-] reversal issue observed during 1J/A) originally planned for yesterday, was postponed until after the upcoming SSRMS ops.

ATV1 Update (Flight Day 24): Yesterday (4/1), the ATV1 began phasing back (by going higher, i.e., slowing down) to the rendezvous initiation point in preparation for docking. Jules Verne performed the following three maneuvers, all of which were reported to be nominal:

- TA1: 6:20am EDT; delta-V: 1.90 m/s
- TA2: 7:06am; delta-V: 6.82 m/s
- TA3: 7:50am; delta-V: 1.00 m/s.

Prior to the maneuvers, at approx. 12:30am, ATV1 repressurized its propulsion system in preparation for docking. By 8:30am yesterday, ATV1 was 10 km above and 700 km in front of ISS, phasing back at approx. 100 km per rev, crossed directly above ISS at approx. 7:15pm last evening and continued on to about 1200 km behind where it will begin a series of 3 TB maneuvers today at ~2:00pm EDT to set up the rendezvous activities.

CEO photo targets uplinked for today were **Somalia Coast** *(in the past Coastal Somalia has exhibited dramatic changes in vegetation greenness in response to ENSO [El Niño-Southern Oscillation] cycles. The ISS pass in mid-afternoon offered nadir viewing conditions as it paralleled the coast. Using the 180mm lens setting for a mapping strip northeastward from Mogadishu during this La Niña phase of the ENSO),* **East Haruj Megafans, Libya** *(this mid-afternoon pass was just left center of this remote target in the Libyan Desert. A mapping swath taken near nadir was requested. The almost featureless landforms of these "desert flats" have been recently recognized as vast spreads of river sediment [megafans]. The sediment has been transported hundreds of km from mountains far to the south. Now-dry river courses can be traced from the mountains. These rivers undoubtedly flowed during wet climate phases in the past),* and **Tenoumer Impact Crater, Mauritania**

(this young impact site is situated in northern Mauritania north of the large, well-known circular landmark feature known as the Richat Structure. It is small, only 1.9-km in diameter and just 10 thousand years old. The ISS pass approached from the SW in mid-afternoon sun. After noting Richat, the crew was to look left of track, trying to get an 800mm view of this feature).

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:52am EDT [= epoch]):*
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Mean altitude loss in the last 24 hours -- 133 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53658

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
04/03/08 -- ATV1 Docking Day 3; ~10:41am EDT
04/07/08 -- Progress M-63/28P undocking (DC1), 4:49am
04/08/08 -- Soyuz TMA-12/16S launch - 7:16am EDT *(CDR Sergei Volkov, FE Oleg Kononenko, SFP Yi So-yeon)*
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~9:02am
04/12/08 -- **Cosmonautics Day**, with **Yuri's Night** (check out http://www.yurisnight.net/2008/)
04/18/08 -- Soyuz TMA-11/15S undocking (FGB nadir port, 11:34pm EDT)
04/19/08 -- Soyuz TMA-11/15S landing (2:52am EDT, 9:52am Moscow/DMT, 12:52pm Kazakhstan)
05/06/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch

08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 04/01/08
Date:	Tuesday, April 01, 2008 12:47:45 PM
Attachments:	

ISS On-Orbit Status 04/01/08

All ISS systems continue to function nominally, except those noted previously or below.

From the US voluntary "job jar" task list, after wakeup and before breakfast CDR Whitson & FE-2 Reisman downloaded the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data from their Actiwatches to the HRF-1 (Human Research Facility 1) laptop, changed the lithium battery in Peggy's Actiwatch and initialized both their watches. They also changed the battery of SFP (Space Flight Participant) Yi So-yeon's Actiwatch and initialized the unit for her. *[To monitor the crewmember's sleep/wake patterns and light exposure, crewmembers wear a special Actiwatch device which measures the light levels encountered by them as well as their patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

FE-1 Malenchenko began his activities with the routine checkup of DC1 (Docking Compartment) circuit breakers and fuses. *[The monthly checkup in the "Pirs" DC1 looks at AZS circuit breakers on the BVP Amp Switch Panel (they should all be On) and the LEDs (light-emitting diodes) of 14 fuses in Fuse Panels BPP-30 & BPP-36.]*

Malenchenko also completed his first session of the 24-hour of ECG (electrocardiogram) recording under the Russian MedOps MO-2 protocol. *[For the ECG recording, the Russian flight engineer yesterday donned the five-electrode Holter harness which read his dynamic (in motion) heart function from two leads over 24 hours and recorded data on the Kardioregistrator 90205 unit.]*

Afterwards, the FE-1 went on to conduct the first part of the onboard "Profilaktika" (MBI-8, "Countermeasures") preventive health maintenance fitness test on the VELO bicycle ergometer. Part 2, on the TVIS treadmill, is scheduled

tomorrow. *[Test procedure for MBI-8, which requires workouts on the VELO and TVIS, is identical to the Russian MO-5 assessment, but in addition to the nominal procedure it uses the TEEM-100M gas analyzer with breathing mask, a blood lactate test with the ACCUSPORT analyzer and REFLOTRON-4 accessories, and a subjective evaluation of physical exertion levels during the test (using the Borg Perceived Exertion Scale, viz., 10 steps from very light over hard and very hard to maximum). Results are entered on a log sheet. TEEM and ECG (electrocardiograph) data are transferred to the RSE-Med laptop, also on a tape cassette (Cardiocassette-2000), and prepared for later downlink via Regul-Packet comm. Results are also called down to specialists standing by at TsUP. Data from the previous session (1/3) were also to be transferred.]*

In preparation for his return to gravity, Yuri also undertook his first preliminary session of the Russian MO-5 MedOps protocol of cardiovascular evaluation in the "Chibis" below-the-waist reduced-pressure suit (ODNT, US: LBNP) on the VELO ergometer, assisted by Whitson as CMO (Crew Medical Officer). *[The 45-min assessment, supported by ground specialist tagup (VHF) and telemetry monitoring from Russian ground sites (at 8:45am EDT), uses the Gamma-1 ECG equipment with biomed harness, skin electrodes and a blood pressure and rheoplethysmograph cuff wired to the cycle ergometer's instrumentation panels. The Chibis ODNT provides gravity-simulating stress to the body's cardiovascular/ circulatory system for evaluation of Malenchenko's orthostatic tolerance (e.g., the Gauer-Henry reflex) after several weeks in zero-G. The preparatory training generally consists of first imbibing 150-200 milliliters of water or juice, followed by a sequence of progressive regimes of reduced ("negative") pressure, set at -20, -25, -30, and -35 mmHg (Torr) for five minutes each while shifting from foot to foot at 10-12 steps per minute, while wearing a sphygmomanometer to measure blood pressure. The body's circulatory system interprets the pressure differential between upper and lower body as a gravity-like force pulling the blood (and other liquids) down. Chibis data and biomed cardiovascular readings are recorded. The Chibis suit (not to be confused with the Russian "Pinguin" suit for spring-loaded body compression, or the "Kentavr" anti-g suit worn during reentry) is similar to the U.S. LBNP facility (not a suit) used for the first time on Skylab in 1973/74, although it appears to accomplish its purpose more quickly.]*

The CDR set up the camcorder equipment for taking video of Garrett Reisman's first PFE-OUM (Periodic Fitness Evaluation - Oxygen Uptake Measurement session on the CEVIS (Cycle Ergometer with Vibration Isolation), filmed via VTR (Video Tape Recorder) from the ground. *[The footage was downlinked afterwards for biomechanical evaluation of the exercising crewmember and assessment of the on-orbit setup of equipment during data collection and hardware status.]*

Later, Whitson & Reisman configured the PFE-OUM equipment at the HRF-2

(Human Research Facility 2) rack for Garrett's workout on the CEVIS while wearing an HRM (Heart Rate Monitor), with Peggy as operator, obtaining measurements of the subject. *[The equipment includes the HRF PFM/PAM (Pulmonary Function Module/Photoacoustic Analyzer Module), Mixing Bag System and GDS (Gas Delivery System). After calibration of the DPFM (Differential Pressure Flowmeter), Peggy assisted in changing the loads on the ergometer and recording data. Later, the CDR updated the evaluation protocol, deactivated & stowed the gear, and powered down the PFE-OUM laptop. Purpose of PFE-OUM is to measure aerobic capacity during exercise within 14 days after arrival on ISS, and once monthly during routine PFEs. The data allows exercise physiologists & flight doctors to assess the crew's health & fitness and to provide data for modifying & updating crew-specific exercise regimes. PFE-OUM is a collaborative effort between NASA and ESA (European Space Agency).]*

Afterwards, the FE-2 removed the experiment hardware, while the CDR disassembled the video setup and stowed it, then gave the Go for the ground to downlink the VTR tape.

Peggy Whitson performed the periodic calibration of the two CSA-O_2 (Compound Specific Analyzer-Oxygen sensor) instruments #1041 & #1052, using a calibration tank with accurately known pressure (2100 psi). *[Partial Pressure Oxygen (ppO_2) readings were 21.7% before and 21.8% after calibration on #1041, 21.7%/21.8% on #1052.]*

Reisman worked in the US Airlock, connecting EMUs (Extravehicular Mobility Units) #3003 & #3004 to their SCU (Service & Cooling Umbilical) and initiated the standard 1-hr scrubbing process on the spacesuits' cooling water loops, filtering ionic and particulate matter (via a 3-micron filter). The cooling loops were afterwards reconfigured and the EMU water processing kit disassembled and stowed.

In preparation for ATV1 (Automated Transfer Vehicle 1) docking on 4/3, Yuri checked on the ready availability of the necessary hardware (adapters, T-pieces, hoses) for doing leak checks on the SM PrK (Service Module Transfer Tunnel) and ATV hatch interface in the event of a failure of the ATV depress valve's power unit (KSD BP).

Afterwards, Malenchenko performed regular maintenance on the SRVK-2M condensate water recovery system in the SM, replacing its end-of-life filter reactor (F-R).

FE-2 Reisman prepared the MELFI (Minus Eighty Degree Laboratory Freezer for

the ISS) for the next DCB (Double Cold Bag) sample stow activity, retrieving fourteen -32deg ICEPAC belts from stowage and inserting them in the various trays and sections of Dewar 3.

Yuri collected water samples from downstream of the BKO multifiltration unit in a drinking bag (paket dlya napitkov) for return to Earth, to monitor the quality of the water being fed from the KOV EDV container through the BKO to the Elektron-VM oxygen generator at the BKO's end-of-life.

Afterwards, Malenchenko worked with the ground on activating of the Elektron-VM at 32 amps, first pressurizing the BZh Liquid Unit with N_2 (nitrogen) via laptop and later monitoring the external temperature of its secondary purification unit (BD) for the first 10 minutes of operations to ensure that there was no overheating. *[During nominal operations a gas analyzer is utilized to detect hydrogen (H_2) in the O_2 line (which could cause overheating) but is not included in the control algorithm until 10 minutes after Elektron startup. Earlier this year (2/9), an EMI filter was installed on the Elektron's current stabilizer (FPP ST-64) to prevent RFI (radio frequency interference) with the ATV1.]*

Later, Malenchenko transferred CWCs (Contingency Water Containers) #1053 & #1072 with US condensate to the Russian Segment (RS) for the periodic (about twice a month) replenishing of the Elektron's water supply for electrolysis, filling the designated KOV EDV container. Once filled, the EDV was connected to the BPK transfer pump for processing through the BKO. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron shutdown.]*

The FE-1 performed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV at the SKV-2 air conditioner for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Working off the discretionary "time permitting" task list, Yuri conducted the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Also from the task list, the FE-1 performed the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian

TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder).

Later today, before sleep time, Peggy will ready the equipment for the periodic acoustic measurement protocol by deploying crew-worn acoustic dosimeters to the crew, to be carried overnight with a microphone on the shirt collar. (Last time done: 2/8). *[Tomorrow, after about 15 hours of measurements, dosimeter data will be downloaded and the hardware power-cycled for another data take. At that point, the crew will deploy the dosimeters statically in the station for the duration of the day, record measurements tomorrow noon and stow the instruments. Acoustic data must be taken twice per Increment, each time for the duration of the 16-hour crew workday.]*

CDR Whitson performed more fine adjustment on the IMV (Intermodular Ventilation) valve's RMO (Remote Manual Override) actuator at the Lab aft port location (LAB1P7), then reinstalled the closeout panels 02, 03, 04 which she had removed on 3/28.

The crewmembers performed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Peggy downloaded the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~4:00am EDT, FE-2 Reisman powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, and power supply) and at 4:05am conducted a ham radio exchange with students at the Shanghai Youth Centre of Science & Technology Education in Xuhui/Shanghai, China. *[Shanghai Youth Centre of Science & Technology (SYCSTE), an institution directly under the Shanghai Education committee, was founded on June 1, 1957, and is one of the earliest afterschool educational centers for teenagers in China. Questions to Garrett were uplinked beforehand but the time did not suffice for answering all of them. "What does the Moon look like in space?"; "Will humans grow taller and taller in the space station without gravity? If a baby is born there, will it grow taller than Yao Ming?"; "Does your hair grow faster in the space station? Could you get a haircut?"; "Does your biologic time change in space? How to set up your sleeping time?"; "Have you ever seen aliens or UFOs in space?"; "In the space station, what kind of method will you use to participate in the 2008 Beijing Olympics?"]*

At ~11:40am, the crew downlinked three PAO TV messages of greetings to TsUP/ Moscow for Cosmonautics Day on April 14, the Anniversary of Yuri Gagarin's launch in Vostok-1 47 years ago. *[The first message was intended for a special event at the Rossiya State Central Concert Hall in Luzhniki on 4/14, the second for the citizens and guests at the 6th Festival "Honorary Citizens" in St. Petersburg (commemorating movie actor Cyril Yurievich Lavrov, People's Artist of the Soviet Union, who portrayed Sergey Pavlovich Korolev in a highly popular movie), and the third for a special Cosmonautics Day event at the Siberian State Aerospace University in Krasnoyarsk. "…Productive cooperation between Russia, USA, Canada, Japan and European countries in the matter of assembly and operation of the International Space Station in the interests of the entire world community promotes and strengthens trust, good neighborly relationship in space and on the Earth…"]*

SSRMS Update: In the period 11:50am-2:50pm EDT today, the Space Station Remote Manipulator System is being "walked off" by ground operators to the Node-2 PDGF (Power & Data Grapple Fixture), to collect FMS (Force/Moment Sensor) characterization data on its LEE A (Latching End Effector A) tomorrow and configure the SSRMS for the planned 1J pre-launch checkout in May. Engineers are also checking out a software patch for two SPDM (Special Purpose Dexterous Manipulator) configuration files to correct the body roll polarity (+/-) reversal issue observed during 1J/A.

ATV Update (Flight Day 23): For yesterday's successfully completed Demo Day 2 rendezvous and demonstration activities, the ATV performed 13 maneuvers, all of which were reported to be nominal:

- TV1: 12:44:13am EDT on 3/31; delta0-V: 2.65 m/s
- TV2: 1:33:27am; delta-V: 2.67 m/s
- IF1: 6:47:09am; delta-V: delta0-V: 0.33 m/s
- IF2: 7:32:59am; delta-V: 0.02 m/s
- IF3: 8:17:07am; delta-V: 1.49 m/s
- HM1: 9:11:44am; delta-V: 1.56 m/s
- HM2: 9:27:13am; delta-V: 0.33 m/s
- HM3: 9:42:43am; delta-V: 0.34 m/s
- HM4: 9:48:13am; delta-V: 2.20 m/s
- CM1: 10:30:14am; delta-V: 1.46 m/s
- CM2: 10:43:14am; delta-V: 0.41 m/s
- CM3: 10:56:14am; delta-V: 0.34 m/s
- CM4: 11:03:34am; delta-V: 1.48 m/s.

The ATV performed a nominal rendezvous scenario and approached to S41 (12

m). Per the plan, ATV-CC/Toulouse commanded a RETREAT/HOLD/RESUME sequence between 11:52:21am and 11:58:18am, and the crew commanded a RETREAT from S41 to S4 at 12:42:02pm. The demonstration activities completed with a successful crew-commanded ESCAPE maneuver that began at 12:52:21pm, with a delta-V of 4.00 m/s. As of last night 7:00pm EDT, Jules Verne was 7 km below and 275 km in front of ISS. ATV1 continued to phase in front of ISS at a rate of approximately 68 km per rev until this morning at 6:21:37am, when it began a series of maneuvers to bring it back to the ISS for Docking Day 3.
Visual confirmation of displaced MLI (Multi-Layer Insulation) aft of the vehicle's forward cone was obtained via the ISS cameras. This is not expected to impact docking operations on 4/3.
The ATV probe was successfully extended on 3/31 at 11:09:56pm EDT.

CEO photo targets (for discretionary picture taking) uplinked for today were **Afar Rift Zone, Ethiopia** *(a swath of detailed images taken along track at nadir was requested for further analysis of volcanoes and fault lines in this unusual part of the planet. The Afar Rift Zone is one of the few places where "sea-floor spreading" can be seen on land. The zone is located where the Red Sea is opening as part of the process of the African, Arabian and the new East African tectonic plates drifting apart),* **Chad basin dust** *(Dynamic event. Change-of-season dust storms have been detected in the Chad basin, east of Lake Chad. Looking left for the margins of any dust clouds. Dust from this basin, one of the most vigorous dust producers on the planet, reaches the Americas several times per year),* **Patagonian Glaciers** *(shooting pictures near nadir for smaller glacier tongues on the west [Pacific] side of the narrow Andes Mts., a region where we have least imagery coverage. There should have been some viewing between scattered clouds),* and **Saharan dust, E. Atlantic Ocean** *(Dynamic event. A major dust event is taking place with dust blowing into the Atlantic Ocean from the Western Sahara Desert. Looking left for the divide between the hazy dust-laden air mass and the clear oceanic air [with some cloud cover]. The short focal-length lens may have permitted the acquisition of islands in any images as landmarks to assist image cataloging)*.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:30am EDT [= epoch]):*
Mean altitude -- 339.3 km
Apogee height -- 339.9 km
Perigee height -- 338.8 km
Period -- 91.32 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0000752

Solar Beta Angle -- 35.0 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 188 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53642

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3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/31/08
Date:	Monday, March 31, 2008 2:05:00 PM
Attachments:	

ISS On-Orbit Status 03/31/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 24 of Increment 16.*

As suggested on his voluntary "job jar" task list, after wakeup and before breakfast FE-2 Garrett Reisman completed his fourth session with the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop. *[To monitor the crewmember's sleep/wake patterns and light exposure, Garrett wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

Preparatory to today's ATV1 "Jules Verne" Demo Day 2, CDR Whitson closed the Lab science window shutters as protection against Russian thruster contamination, configured the designated A31p laptop in the FGB for transmitting analog & digital video of the RS (Russian Segment) activities from the MPEG-2 (Moving Pictures Expert Group 2) encoder, downlinked via U.S. OpsLAN and Ku-band in "streaming video" packets, and later deactivated the A31p after the rendezvous activities.

FE-1 Malenchenko meanwhile readied the KL-154 "Klest" television equipment from the SM (Service Module)'s ATV TV control console (BRTK-PU).

ISS attitude control authority was handed over to RS MCS (Motion Control System) thrusters at 7:37am EDT for maneuvering the station to ATV1 rendezvous attitude (8:11am). *[Rendezvous attitude: LVLH (Local Vertical Local Horizontal) +XVV (+x-axis in velocity vector), YPR (Yaw, Pitch, Roll) = 0,0,0. Later, after returning to TEA (Torque Equilibrium Attitude) at ~1:25pm, control was returned to U.S. momentum management at 1:55pm.]*

After preparing for the second ATV1 rendezvous demo, Malenchenko & Whitson activated and tested the MBRL/PCE (Proximity Communications Equipment) Space-to-Space Radio hardware of the ASN-M satellite navigation system in the SM, then monitored the approach, station-keeping and subsequent escape maneuver of the automated ATV1, recording times and performance data. All planned maneuvers were completed entirely nominally. *[Demo Day 2 involved Jules Verne closing in on ISS from the S-1/2 waypoint about 40km behind (at 8:26am EDT), arriving via Hohmann transfer at the S2 station-keeping (holding) point at a distance of ~3500m behind ISS (~9:57am) for subsequent testing of HOLD & RETREAT commands through the PCE. Approach continued to the second holdpoint, S3 at ~249 m (~11:10am), then to S4 at ~19m (by 12:13pm), followed by inching closer to S41 (12m) for more HOLD & RETREAT command tests, next retreating to S4 and finally performing the actual ESCAPE maneuver of 4 m/sec delta-V (~12:38pm) to take the vehicle away from the station, closing out Demo Day 2 ops at ~12:45pm.*
Background: Navigation between S-1/2 and S3 is based on GPS (Global Positioning System) data of the ISS which are received by the ATV and compared with ATV GPS data. From S3 to docking, ATV employs two sophisticated measuring systems for range, line-of-sight angles & relative attitude,- the VDM (Videometer) and Telegoniometer (TGM), which use lasers illuminating RVTs (Rendezvous Targets) on the aft end of the SM, installed previously on Russian spacewalks. The ISS crew is prohibited by Flight Rule to view the ATV through cameras or binoculars when inside a range of 5 m, and also not with the naked eye from SM window 26, until VDM & TGM are powered off, to prevent eye damage from non-visible light.]

Afterwards (~1:30pm), Peggy & Yuri were scheduled for a debriefing teleconference with the ground to review the ground/crew communications and determine if anything needs to be changed before Docking Day next Thursday (4/3).

The FE-1 performed the periodic (generally monthly) service of the ESA/RSC-Energia experiment ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS), removing the PCMCIA memory card #945 and replacing it with #941 on the AST spectrometer on DC1 panel 402 to continue operations, then testing #945 on the RSK1 laptop for data quantity and total size of files, before stowing it for later return to Earth. Yuri also photographed the future new location of the AST in the FGB (beginning on 4/8).

Malenchenko also started his first session of the Russian MedOps MO-2 protocol which calls for 24-hour recording of his ECG (electrocardiogram). *[For the ECG recording, Yuri donned the five-electrode Holter harness that read his dynamic (in motion) heart function from two leads over 24 hours and record data on the Kardioregistrator 90205 unit. CDR Whitson assisted her crewmate in the harness donning (and will also do so in tomorrow's doffing).]*

FE-2 Reisman worked in the JLP (Japanese Experiment Module Experiment Logistics Module Pressurized Section), first performing the periodic status and shell temperature check from the MKAM (Minimum Keep-Alive Monitor), then briefly activating the MKAM fan and relocating the module's PBA (Portable Breathing Apparatus) from its location COL1PF in the COL (Columbus Orbital Laboratory) to the JLP endcone. After troubleshooting the wiring and fixture of the failed JLP GLA (General Luminaire Assembly) P2A, Garrett conducted the periodic inspection of the PEP PFE (Portable Emergency Provisions/Portable Fire Extinguisher), then deactivated the JLP fan again and returned the PBA to the COL1PF location.

Reisman also undertook the monthly FDS (Fire Detection & Suppression) PEP safety inspection/audit in the other ISS modules besides JLP. *[The IMS (Inventory Management System)-supported inspection involves verification that PFEs (portable fire extinguishers), PBAs (portable breathing apparatus), QDMAs (quick-don mask assemblies) and EHTKs (extension hose/tee kits) are free of damage to ensure their functionality, and to track shelf life/life cycles on the hardware (QDMA harness inspection was not required this time).]*

Malenchenko had another hour reserved for transferring more discarded cargo to the Progress 28P and stowing it according to detailed plan in the logistics spacecraft-turned-trash can, to be jettisoned next week (4/7).

FE-2 Reisman was scheduled to initiate, later terminate, a total-pressure adjustment of the cabin atmosphere with air from 28P storage.

Garrett also unstowed and set up the PFE-OUM (PFE-Oxygen Uptake Measurement) equipment on the HRF-2 (Human Research Facility 2) rack, including the HRF PFM/PAM (Pulmonary Function Module/Photoacoustic Analyzer Module), Mixing Bag System and GDS (Gas Delivery System), for his first PFE-OUM protocol session tomorrow. *[The Periodic Fitness Evaluation with Oxygen Uptake Measurement experiment, using the CEVIS ergometer for workout, demonstrates the capability of crewmembers to perform periodic fitness evaluations with continuous oxygen consumption measurements within 14 days after arrival on ISS, and once monthly during routine PFEs. Once the capability of the pulmonary function system (PFS) to perform PFEs is verified, crewmembers will be able to integrate their monthly PFE with oxygen consumption measurements to fulfill the requirement for cardiovascular fitness evaluations during long-duration space flight.]*

The FE-1 performed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities

systems/replaceables plus the weekly collection of the toilet flush counter (SPK-U) and water supply (SVO) readings for calldown to TsUP/Moscow. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV at the SKV-2 air conditioner for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

In the Lab, Peggy Whitson worked on the MELFI (Minus-Eighty Laboratory Freezer for ISS) rack, preparing box modules in Dewar 1, Tray C, for easier Double Coldbag packing, by removing obstructing Velcro straps.

The crewmembers performed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1/full time), and RED resistive exercise device (CDR, FE-2).

Afterwards, Garrett downloaded the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Reisman had another 60 minutes for himself for general orientation (station familiarization & acclimatization), as is standard daily rule for the first two weeks after starting station residency.

Peggy Whitson spent about an hour on end-of-increment cleanup and departure preparations. *[Instructions on packing of return items and a keep vs. trash list were uplinked for assisting Yuri and Peggy in their preparing for their return in the severely downmass-limited Soyuz Descent Module. Trashed items will be stowed in the Orbital Module, to be separated along with the Instrumentation/Propulsion Module prior to atmospheric entry.]*

Working off his suggested "time permitting" task list, Yuri Malenchenko completed a series of regular servicing tasks, viz.: -

- Supporting the BIO-5 Rasteniya-2 ("Plants-2") experiment, which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}), by monitoring the greenhouse, taking pictures and downloading them to the ground;
- Performing the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART

(automatic temperature recorder), and

- Conducting the daily IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/ import to its three databases on the ground (Houston, Moscow, Baikonur).

ATV Update (Flight Day 22): In preparation for today's successful Demo Day 2 rendezvous & approach program, the ATV1 yesterday began phasing back to the rendezvous initiation point S1/2 at ~30km behind the ISS, performing the following six maneuvers, all of which were reported to be nominal:

- TA1: 8:22:06pm on 3/29; delta-V: 1.70 m/s
- TA2: 9:08:06pm; delta-V: 7.32 m/s
- TA3: 9:53:54pm; delta-V: 1.23 m/s
- TB1: 4:34:28pm on 3/30; delta-V: 5.18 m/s
- TB2: 5:18:27pm; delta-V: 8.16 m/s
- TB3: 6:08:59pm; delta-V: 2.50 m/s.

The IMMT (ISS Mission Management Team) afterwards gave the GO for Demo Day 2.

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:43am EDT [= epoch]):*
Mean altitude -- 339.5 km
Apogee height -- 340.4 km
Perigee height -- 338.7 km
Period -- 91.32 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0001248
Solar Beta Angle -- 38.9 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 115 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53627

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
04/03/08 -- ATV1 Docking Day 3; ~10:41am EDT
04/07/08 -- Progress M-63/28P undocking (DC1), 4:49am
04/08/08 -- Soyuz TMA-12/16S launch - 7:16am EDT *(CDR Sergei Volkov, FE Oleg Kononenko, SFP Yi So-yeon)*
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~9:02am
04/12/08 -- **Cosmonautics Day**, with **Yuri's Night** (check out http://www.yurisnight.

net/2008/)
04/18/08 -- Soyuz TMA-11/15S undocking (FGB nadir port, 11:34pm EDT)
04/19/08 -- Soyuz TMA-11/15S landing (2:52am EDT, 9:52am Moscow/DMT, 12:52pm Kazakhstan)
05/06/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/31/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS (5:01pm EDT)
06/02/08 -- STS-124/Discovery/1J docking
07/10/08 -- Russian EVA-20 (7/10-11)
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at

http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/30/08
Date:	Sunday, March 30, 2008 1:36:13 PM
Attachments:	

ISS On-Orbit Status 03/30/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday -- off-duty day for CDR Whitson, FE-1 Malenchenko & FE-2 Reisman except for housekeeping and voluntary work. Ahead: Week 24 of Increment 16. Flight Control to Crew: "Everyone at the ATV-CC (as well as MCC-M and MCC-H) could not be more pleased with how Demo Day 1 went!"*

From his voluntary "job jar" task list, after wakeup and before breakfast FE-2 Garrett Reisman completed his third session with the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop. *[To monitor the crewmember's sleep/wake patterns and light exposure, Garrett wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

Also before breakfast, having reached the FD15 (Flight Day 15) mark in his flight, Reisman performed the last sampling of his first session with the NASA/JSC experiment NUTRITION w/Repository, collecting a final urine sample upon wakeup for storage in the MELFI (Minus-Eighty Laboratory Freezer for ISS). The sampling kit was then stowed away. *[The current NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

The crew conducted the regular weekly three-hour task of thorough house cleaning. *["Uborka", normally done on Saturdays, includes removal of food waste products,*

cleaning of compartments with vacuum cleaner, damp cleaning of the Service Module (SM) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab. Additionally, as part of the weekly cleaning, Malenchenko performs an inspection of structural elements, cables and instruments behind SM panels for moisture.]

Later, the FE-1 completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables plus the weekly collection of the toilet flush counter (SPK-U) and water supply (SVO) readings for calldown to TsUP/Moscow. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV at the SKV-2 air conditioner for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Yuri also gathered weekly data on total operating time & “On” durations of the Russian POTOK-150MK (150 micron) air filter unit of the SM’s SOGS air revitalization subsystem for reporting to TsUP.

Whitson & Malenchenko conducted another OBT (Onboard Training) session, Part 2, for ATV1 Approach & Docking Demo Day 2 tomorrow (3/31), reviewing RODF (Russian Operations Data File) material and running a number of scenarios, including malfunctions, on the ATV simulator application, supported by S-band tagup with ground engineers.

In preparation for the upcoming Japanese CW/RW (Cell Wall/Resist Wall) experiment, FE-2 Garrett Reisman
replaced eight ECs Experiment Containers) on the centrifuges of the EMCS (European Modular Cultivation System) facility with different ECs. *[The EMCS rack contains two rotating centrifuges that can support a wide range of small plant & animal experiments under partial gravity conditions. On Rotor A, the new ECs for CW/RW are EC92 in position A1, EC95 at A2, EC94 at A3, EC96 at A4, on Rotor B - EC97 in position B1, EC99 at B2, EC98 at B3, and EC100 at B4. The removed ECs were stowed.]*

With the U.S. CDRA (Carbon Dioxide Removal Assembly) deactivated by the ground early this morning (~3:15am-8:15am EDT) and its cooling no longer required, Whitson demated and took down the ITCS LTL (Internal Thermal Control System/Low Temperature Loop) jumper at the CDRA-supporting LAB1D6 rack.

[After Peggy's troubleshooting on 3/28, CDRA was operated for a day, but ground engineers could not resolve the elevated Precooler differential pressure (dP) offset between half-cycle 1 & half-cycle 2 operations. The anomalous dP signature has not been explained yet, despite several days of troubleshooting. Ground teams are now discussing further troubleshooting options.]

Working off his suggested "time permitting" task list, Yuri Malenchenko completed a series of regular maintenance tasks for today, by -

- Conducting his tenth and final Increment 16 run of the Russian DZZ-2 "Diatomeya" ocean observations program *[using the NIKON F-5 digital still camera with 80-200 mm lens and the SONY PD-150P camcorder at medium zoom, Yuri focused on color bloom patterns, swirls, wakes of subsurface waves, ocean water level drop, smoothing lanes in wave fields, and sudden cloud pattern anomalies in the Atlantic and Indian oceans]*;
- Performing another session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program *[using the NIKON D2X still camera and the Japanese HDV (High Definition) video camera provided by SFP Charles Simonyi to shoot imagery of icebergs in the southern portion of the Atlantic ocean, Patagonian glaciers, coastal & mountain areas of Columbia, and the cities of Palmira, Bogotá and coastal cities on the Atlantic]*;
- Supporting the BIO-5 Rasteniya-2 ("Plants-2") experiment, which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}), by monitoring the greenhouse, taking pictures and downloading them to the ground;
- Performing the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder), and
- Completing the periodic collection & deletion of readings on the MOSFET (metal oxide semiconductor field-effect transistor) radiation sensor reader/ display of the RBO-3-2 Matryoshka-R antroph-amorphous (human torso) "phantoms" located inside the station for sophisticated radiation studies, collecting radiation measurements every 15 minutes around the clock.

The crewmembers performed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1/full time, FE-2), and RED resistive exercise device (CDR, FE-2).

ATV Update (Flight Day 21): After a highly successful Demo Day 1 rendezvous & approach program yesterday, the ATV1 last night was 120 km in front of and 6.5 km below the ISS. Jules Verne continued to phase in front of ISS at a rate of ~60 km

per rev until 8:21pm EDT, when it began coming back for Demo Day 2 tomorrow. The rendezvous consisted of the following ten maneuvers, all of which were reported to be nominal:

- TV1: 2:36:30am EDT; delta-V: 2.74 m/s
- TV2: 5:13:36am; delta-V: 2.34 m/s
- TV3: 6:10:08am; delta-V: 1.53 m/s
- IF1: 8:39:20am; delta-V: 0.58 m/s
- IF2: 9:25:23am; delta-V: 0.12 m/s
- IF3: 10:10:31am; delta-V: 0.55 m/s
- HM1: 11:10:15am; delta-V: 1.53 m/s
- HM2: 11:25:44am; delta-V: 0.17 m/s
- HM3: 11:41:14am; delta-V: 0.27 m/s
- HM4: 11:46:44am; delta-V: 2.05 m/s.

At Hold point S2 (~3500 m behind ISS), the ATV performed stationkeeping from 11:56:45am to 1:30:11pm. During this time, the crew successfully performed the HOLD and RETREAT command path test. In addition, the Kurs system was activated and used to collect data for comparison with the ATV's RGPS system. The rendezvous completed with a successful ESCAPE maneuver that began at 1:30:11pm, with a delta-V of 4.03 m/s. *[Between maneuvers TV1 & TV2, PDE-1 (Propulsion Drive Electronics #1) was disabled by the FDIR (Fault Detection, Isolation & Recovery) system due to a thermal delta temperature threshold violation. ATV-CC/Toulouse attempted to reintegrate the PDE, but during the reintegration the FDIR deactivated the PDE a second time for the same temperature threshold violation. Due to an unrelated concern regarding the procedure for reintegrating PDE-1, ATV-CC decided to wait until after the completion of TV2 & TV3 before reintegrating PDE-1. As a result, TV2 & TV3 were performed in a three-PDE configuration. Following TV3, PDE-1 was successfully reintegrated.]*

No CEO photo targets uplinked for today.

CEO photography can be studied at this “Gateway” website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:21am EDT [= epoch]):*
Mean altitude -- 339.6 km
Apogee height -- 340.0 km
Perigee height – 339.3 km
Period -- 91.33 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0000534
Solar Beta Angle -- 42.5 deg (magnitude decreasing)

Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 297 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53611

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
04/07/08 -- Progress M-63/28P undocking (DC1), 4:49am
04/08/08 -- Soyuz TMA-12/16S launch - 7:16am EDT *(CDR Sergei Volkov, FE Oleg Kononenko, SFP Yi So-yeon)*
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~9:02am
04/12/08 -- **Cosmonautics Day**, with **Yuri's Night** (check out http://www.yurisnight.net/2008/)
04/18/08 -- Soyuz TMA-11/15S undocking (FGB nadir port, 11:34pm EDT)
04/19/08 -- Soyuz TMA-11/15S landing (2:52am EDT, 9:52am Moscow/DMT, 12:52pm Kazakhstan)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking

12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/29/08
Date:	Saturday, March 29, 2008 3:01:23 PM
Attachments:	

ISS On-Orbit Status 03/29/08

All ISS systems continue to function nominally, except those noted previously or below.

Per his voluntary "job jar" task list, after wakeup and before breakfast FE-2 Garrett Reisman completed his second session with the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop. *[To monitor the crewmember's sleep/wake patterns and light exposure, Garrett wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

Also before breakfast, having reached the FD15 (Flight Day 15) mark in his flight, Reisman undertook his first session with the NASA/JSC experiment NUTRITION w/ Repository, collecting blood and urine samples. *[Acting as operator and CMO (Crew Medical Officer), CDR Whitson performed phlebotomy on Garrett, i.e., drew blood samples (from an arm vein) which were first allowed to coagulate in the Repository, then spun in the HRF RC (Human Research Facility/Refrigerated Centrifuge) and finally placed in MELFI (Minus-Eighty Laboratory Freezer for ISS). The RC was later powered off after a temperature reset to limit wear on the compressor, and cleaned. Garrett's urine samples were also placed in the MELFI. Background: NUTRITION is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight; this includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes. The Clinical Nutritional Assessment profile currently required on all U.S. Astronauts collects blood and urine samples preflight and postflight. NUTRITION expands this protocol by also capturing in-flight samples and an additional postflight sample. Furthermore, additional measurements are included for samples from all sessions, including additional markers of bone metabolism, vitamin status, and hormone and oxidative stressor tests. The results*

will be used to better understand the impact of countermeasures (exercise and pharmaceuticals) on nutritional status and nutrient requirements. The Clinical Nutritional Assessment profile (MR016L), first started on two Mir crewmembers and then on all ISS US crews, nominally consists of two pre-flight and one post-flight analysis of nutritional status, as well as an in-flight assessment of dietary intake using the FFQ (Food Frequency Questionnaire). The current NUTRITION project expands MR016L testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]

In preparation for today's ATV1 "Jules Verne" Demo Day 1, Peggy Whitson & Yuri Malenchenko –

- closed the Lab science window shutters as protection against Russian thruster contamination,
- set up the KL-154 "Klest" television equipment in the SM (Service Module) with the ATV TV control console (BRTK-PU),
- configured the designated A31p laptop in the FGB for transmitting analog & digital video of the activities from the RS (Russian Segment) from the MPEG-2 (Moving Pictures Expert Group 2) encoder, downlinked via U.S. OpsLAN and Ku-band in "streaming video" packets, and
- deactivated the A31p after the rendezvous demo activities.

ISS attitude control authority was handed over to RS MCS (Motion Control System) thrusters at 9:30am EDT for maneuvering the station to ATV1 rendezvous attitude at 10:04am. *[Rendezvous attitude: LVLH (Local Vertical Local Horizontal) +XVV (+x-axis in velocity vector), YPR (Yaw, Pitch, Roll) = 0,0,0. Later, after returning to TEA (Torque Equilibrium Attitude) at ~1:37pm, control was handed back to U.S. momentum management at 2:12pm.]*

After preparing for the ATV1 rendezvous demo in the SM, Malenchenko & Whitson activated and checked out the MBRL/PCE (Proximity Communications Equipment) Space-to-Space Radio hardware of the ASN-M satellite navigation system, then monitored approach, station-keeping and subsequent escape maneuvers of the remote-controlled ATV1, recording times and performance data. *[The Demo Day 1 program involved Jules Verne closing in on ISS from ~39km behind (at 10:18am EDT) to 15.5. km (by 11:02am) and arriving at the S2 holding point at a distance of ~3500m behind ISS at ~11:48am for subsequent testing of HOLD, RETREAT, ESCAPE and other critical commands through PCE without actually executing them. Afterwards, the actual Escape maneuver of 4 m/sec delta-V was to take the vehicle away from and below the station at ~1:29pm.]*

Afterwards, Peggy & Yuri were scheduled (~2:30pm) for a debriefing teleconference

with the ground to review the ground/crew communications and determine if anything needs to be changed before Demo Day 2.

FE-2 Reisman meanwhile performed the periodic offloading of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling CWC (Contingency Water Container) #1062 with the collected water slated for processing. No samples required this time. *[Estimated offload time before termination (leaving ~6 kg in the tank): ~35 min.]*

In the COL (Columbus Orbital Laboratory), Garrett also checked out the EMCS (European Modular Cultivation System) applications on the laptop computer (ELC) in the newly relocated US ER3 (EXPRESS Rack 3) which he connected yesterday for ground-commanded power-up. *[The EMCS rack contains a rotating centrifuge that can support a wide range of small plant and animal experiments under partial gravity conditions.]*

Yuri Malenchenko had another hour set aside for his end-of-increment cleanup and departure preparations. *[Instructions on packing of return items and a keep vs. trash list were uplinked for assisting Yuri and Peggy in their preparing for their return in the severely downmass-limited Soyuz Descent Module. Trashed items will be stowed in the Orbital Module, to be separated along with the Instrumentation/ Propulsion Module prior to atmospheric entry.]*

Afterwards, the FE-1 completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Whitson conducted the periodic (monthly) CSA-CP (Compound Specific Analyzer-Combustion Products) maintenance/checkout, today on all four units. *[The CSA-CP is a passive cabin atmosphere monitor that provides quick response capability during a combustion event (fire). Its collected data are stored on a logger. Peggy changed out the battery on the prime unit, then zero-calibrated all instruments (to eliminate drift in the combustion sensors). Following zero calibration, the backup units were stowed in the Node, along with the sampling pump, while the prime unit was deployed at the SM Central Post.]*

Yuri performed another run with the Russian "Uragan" (hurricane) earth-imaging program, using the Nikon D2X digital camera through SM windows 6-9. *[Targets uplinked for today were the country of Columbia (natural environment) and the city*

of Bogotá.]

Working off his “available time” discretionary task list, Malenchenko also performed the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator,

The crewmembers performed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1/full time, FE-2), and RED resistive exercise device (CDR, FE-2).

Afterwards, the CDR transferred the crew’s exercise data file to the MEC (Medical Equipment Computer) laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~8:05am, the crewmembers held their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP/Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

ATV Update (Flight Day 20): Yesterday (3/28), the ATV1 performed the following three maneuvers, all of which were reported to be nominal:

- TB1: start 6:48:53pm EDT, delta-V: 5.976 m/s
- TB2: start 7:38:13pm, delta-V: 6.947 m/s
- TB3: start 8:30:32pm, delta-V: 3.054 m/s.

ATV-CC/Toulouse completed an RDS (Russian Docking System) checkout. The preliminary results were nominal; however a detailed evaluation is being performed by the ATV-CC Engineering Support Team. In addition, the ISS crew completed the third ATV rendezvous on-board training session yesterday. Due to a problem with the simulator software on the crew's laptop, a subset of the session will be repeated on 3/30.

ATV-CC continues to see higher than expected power consumption from the pressurized module shell heaters and preliminary investigations indicate the problem is due to loose or missing thermal blankets. MART (Multi-lateral Anomaly Resolution Team) meetings were held on 3/27 & 3/28 and concluded that there will be no impacts to docking or crew ingress, and no impact to undocking has been identified.

Weekly Science Update (Expedition Sixteen -- Week 23)

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Radiation

measurements continue to be performed in the PIRS module. Radiation measurements continue to be performed in the PIRS module.

ANITA: Completed.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): Two sides of first Silicate Garden complete with students analyzing data in their classrooms currently, and two Petri Dish runs complete but with no results. The Petri Dish installed during 1JA joint ops contains two small tomato plants as seen in the downlinked images with a possible third new one. This Petri Dish will remain in place until 1J when it will be returned for analysis of plant material.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): In progress.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Last session (4th) is currently planned just before Soyuz docked Ops.

EuTEF (European Technology Exposure Facility): The EuTEF platform power feeders have been successfully de-activated/re-activated in conjunction with the EVA-3 and EVA-5 on 3/18 and 3/23, respectively. On 3/24, a graceful shutdown was performed after off-nominal and incoherent telemetry readings. EuTEF is nominal since then. - DEBIE-2: the instrument showed regular link errors. Currently powered off; - DOSTEL: On-going science acquisition; - EuTEMP: Currently inactive as planned; - EVC: after a successful commissioning, we encountered some difficulty to get nominal images acquisition. Under investigation if the problem comes from EVC itself or from the Columbus High Rate Multiplexer; Currently

powered off; - EXPOSE: On-going science acquisition; - FIPEX: FIPEX showed Link Errors and was further troubleshooted this week; tests are on-going and basic science measurements are collected; - MEDET: On-going science acquisition; - PLEGPAY: The first long-duration (100 hrs) experiment has been started on 3/26; Currently powered on; - TRIBOLAB: in Stand-by mode, awaiting to start science acquisition after ATV docking on 4/3; Currently powered on.

Fluid Science Laboratory (FSL): The FSL Facility is awaiting further troubleshooting after 1J/A departure.

GEOFLOW: On 3/25, the FSL VMU (Video Management Unit) Optical Fibre has been tested and is fully functional. The FSL commissioning will continue in the next coming weeks. FSL LAN and MIL bus repair activities have been postponed until after 1J/A mission. Start of GEOFLOW is pending further FSL troubleshooting/ commissioning activities.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Blood and urine samples of first session have been downloaded on STS-123 (1J/A). Second session is currently planned during Soyuz docked Ops.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: "Peggy, thank you for unstowing Garrett's saliva kit and having it ready for him to begin his collections. Garrett, we appreciate your efforts during your early increment Integrated Immune session."

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Complete.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 "Pirs".

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION/REPOSITORY: Planned.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): "Peggy, we have placed on your task list next week the next Sleep download activity. During this activity you will be changing the battery in your Actiwatch as well as downloading and initializing 1J/A FE-2 and your Actiwatches. You will also change the battery and initialize an Actiwatch for the South-Korean SFP (KARI Space Flight Participant). Thanks for your participation."

SOLAR (Solar Monitoring Observatory): Anomaly on platform Sun pointing mode under further investigation: no science acquisition possible so far. However, calibration runs of SOLSPEC spectral lamps have been performed on 3/26 and 3/27. On 3/27, SOLAR went unexpectedly in stand-by mode, but has been fully recovered. The calibration run on 3/27 will have to be repeated.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: "Peggy, thank you for moving and checking out the Ultrasound – we were VERY excited to see if functioning nominally!"

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): The 4 ECs (Experiment Containers) from Rotor A (0-g condition) transfer from BIOLAB TCU#1 (Temperature Control Unit 1) to MERLIN (Microgravity Experiment Research Locker Incubator II) cooler unit has been successfully performed on 3/24. The MERLIN temperature was monitored on a daily basis and was very stable. These 4 ECs have been downloaded on STS-123 (1J/A) and currently shipped to Germany. The 4 ECs of Rotor B are yet to be retrieved by the crew from the blocked Rotor B. BIOLAB anomalies encountered during WAICO-Run#1 imply major impact on science return.

CEO (Crew Earth Observation): Ongoing.

CEO photo targets (for discretionary picture taking) uplinked for today were **Spider Impact Crater, W Australia** *(this 13-km-wide crater is old [>570 million years]. A comprehensive search of the CEO database shows no handheld images),* **Hyderabad, India** *(looking immediately left for this important city of 6.7 million. Visual cue is the dark line of the river that runs through the city. Trying to shoot the diffuse urban boundary),* **Somalia Coast** *(CEO observers are documenting longer term changes of vegetation in this semi desert. Shooting a swath following the coast. Vegetation seems to green and die off in concert with multi-year El Niños),* and **Kwanza Basin, Angola** *(a mapping swath under track was requested to document new economic development as oil wealth streams into Angola. Looking for linear features such as railroads, highways, and power lines)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:00am EDT [= epoch]):*
Mean altitude -- 339.9 km
Apogee height -- 340.6 km
Perigee height – 339.3 km
Period -- 91.33 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0000903
Solar Beta Angle -- 45.8 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 137 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53595

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
04/07/08 -- Progress M-63/28P undocking (DC1), 4:49am
04/08/08 -- Soyuz TMA-12/16S launch - 7:16am EDT *(CDR Sergei Volkov, FE Oleg Kononenko, SFP Yi So-yeon)*
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~9:02am
04/12/08 -- **Cosmonautics Day**, with **Yuri's Night** (check out http://www.yurisnight.net/2008/)
04/18/08 -- Soyuz TMA-11/15S undocking (FGB nadir port, 11:34pm EDT)
04/19/08 -- Soyuz TMA-11/15S landing (2:52am EDT, 9:52am Moscow/DMT, 12:52pm Kazakhstan)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)

05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/28/08
Date:	Friday, March 28, 2008 2:54:00 PM
Attachments:	

ISS On-Orbit Status 03/28/08

All ISS systems continue to function nominally, except those noted previously or below.

As per his voluntary “job jar” task list, after wakeup and before breakfast FE-2 Garrett Reisman completed his first session with the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment software for data logging and filling in questionnaire entries in the experiment’s laptop session file on the HRF-1 laptop. *[To monitor the crewmember’s sleep/wake patterns and light exposure, Garrett wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days.]*

FE-1 Yuri Malenchenko serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out" cycle to vacuum on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process was terminated before sleeptime, at ~4:30pm EDT. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. Filter bed 1 was regenerated yesterday.]*

After reviewing the ATV rendezvous & docking timeline plus uplinked RODF (Russian Operations Data File) crew procedures, CDR Whitson & FE-1 Malenchenko used the onboard ATV Rendezvous, Docking & Undocking simulator software to conduct training runs.

Later, Whitson set up the video gear for Ku-band analog & digital video downlink, in support of engineers testing the ATV docking video transmission to the ground. Afterwards, the CDR deactivated the A31p laptop used for the downlink.

Peggy & Garrett had about half an hour reserved to work on the CMRS (Crew

Medical Restraint System), stowed in the CHeCS (Crew Health Care Systems) rack, performing the periodic checkout and inspection of the system for upcoming standard CMO (Crew Medical Officer) proficiency training. *[The crew inspected the CMRS for cracks in the board and/or metal fastener exposed on top of CMRS (found on the ground units), either of which could provide a high-voltage defibrillation ground path from the patient to ISS structure. The board-like CMRS allows strapping down a patient on the board with a harness for medical attention by the CMO who is also provided with restraints around the device. The device can be secured to the ISS structure within two minutes to provide a patient restraint surface for performing emergency medical procedures, such as during ACLS (Advanced Cardiac Life Support). It can also be used to transport a patient between the station and the Orbiter middeck. It isolates the crew and equipment electrically during defibrillations and pacing electrical discharges, accommodates the patient in the supine zero-G positions, provides cervical spine stabilization and, for a three-person crew, can also restrain two CMOs during their delivery of medical care.]*

Reisman also performed the regular inspection and checkout of the HMS RSP (Health Maintenance System/Respiratory Support Pack).

After setting up the Rodnik “plumbing” gear on 3/22 and testing the Progress 28P’s BV1 tank bladder for leak tightness, Malenchenko today transferred accumulated urine from two EDV containers (#381, #360) to the BV1 water tank. *[Each of the two spherical Rodnik tanks consists of a hard shell with a soft membrane (bladder) composed of elastic fluoroplastic. The bladder is used to expel water from the tank by compressed air pumped into the tank volume surrounding the membrane.]*

With the US ER3 (EXPRESS Rack 3) now located in the COL (Columbus Orbital Laboratory) as of 3/22, Garrett Reisman installed the cables for the rack’s EMCS (European Modular Cultivation System) facility, then configured the EMCS power switch to On and opened the gas valves, preparatory to the EMCS checkout scheduled tomorrow. *[The EMCS rack contains a rotating centrifuge that can support a wide range of small plant and animal experiments under partial gravity conditions. The EMCS gas valves must be opened manually within 24 hours prior to EMCS facility powerup if the power up is performed via ground commanding.]*

In the Lab, Whitson connected the regular ITCS LTL (Internal Thermal Control System/Low Temperature Loop) coolant jumper at the LAB1D6 rack in support of ground-commanded activation of the U.S. CDRA (Carbon Dioxide Removal Assembly) at 12:10pm-12:40pm EDT for troubleshooting the unit. Peggy supported the blower on/off activity by removing (later reinstalling) ducting between ASV (Air Supply Valve) 102 and absorbent bed 2.

Malenchenko conducted the periodic (monthly) functional closure test of the Vozdukh CO2 removal system's spare emergency vacuum valves (AVK), in the spare parts kit. *[The AVKs are critical because they close the Vozdukh's vacuum access lines in the event of a malfunction in the regular vacuum valves (BVK) or a depressurization in the Vozdukh valve panel (BOA). Access to vacuum is required to vent* CO2 *during the regeneration of the absorbent cartridges (PP). During nominal operation, the AVK valves remain open.]*

After preparing the auditory test equipment, Peggy, Yuri & Garrett each took the periodic (monthly) O-OHA (On-Orbit Hearing Assessment) test, a 30-min. NASA environmental health systems examination to assess the efficacy of acoustic countermeasures, using a special MEC (Medical Equipment Computer) laptop application. It was the fourth session for the CDR & FE-1, the first for the FE-2. *[The O-OHA audiography test involves minimum audibility measurements for each ear over a wide range of frequencies (0.25-10 kHz) and sound pressure levels, with the crewmembers using individual-specific Prophonics earphones, Bose ANC headsets and the SLM (sound level meter). To conduct the testing, the experimenter is supported by special EarQ software on the MEC, featuring an up/ down-arrow-operated slider for each test frequency that the crewmember moves to the lowest sound pressure level at which the tone can still be heard. The baseline test is required not later than about Flight Day 14 for each new Expedition and is then generally performed once per month. Note: There have been temporary hearing deficits documented on some U.S. and Russian crewmembers, all of which recovered to pre-mission levels.]*

For the Russian flight engineer, it was time today for his first orthostatic hemodynamic endurance test session with the Russian Chibis suit in preparation for his return to gravity on 4/19, conducting the MedOps MO-4 exercise protocol in the below-the-waist reduced-pressure device (ODNT, US: LBNP/Lower Body Negative Pressure). With Peggy assisting her crewmate as CMO (Crew Medical Officer), the one-hour session was supported by ground specialist tagup via VHF at ~12:01pm EDT on DO1. *[The Chibis provides gravity-simulating stress to the body's cardiovascular/circulatory system for evaluation of Malenchenko's orthostatic tolerance (e.g., the Gauer-Henry reflex) after 200 days in zero-G. Data output include blood pressure readings.]*

In the US Lab, FE-2 Reisman set up the hardware associated with urine and blood collections for his first session of NASA's NUTRITION w/Repository experiment, scheduled on his timeline tomorrow, requiring Garrett to start his mandatory 8-hr fasting tonight for the blood draw. *[The 24-hr urine sampling begins with the first void tomorrow morning and continues through the first void on Sunday morning. The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes*

measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]

CDR Whitson removed closeout panels in the Lab for IFM (Inflight Maintenance) of the port IMV (Intermodular Ventilation) valve of the THC (Temperature & Humidity Control) system, working with the ground to adjust the valve RMO (Remote Manual Override).

Yuri Malenchenko had another hour set aside for his end-of-increment cleanup and departure preparations. *[Instructions on packing of return items and a keep vs. trash list were uplinked for assisting Yuri and Peggy in their preparing for their return in the severely downmass-limited Soyuz Descent Module. Trashed items will be stowed in the Orbital Module, to be separated along with the Instrumentation/ Propulsion Module prior to atmospheric entry.]*

Garrett Reisman spent ~60 minutes for general orientation (station familiarization & acclimatization), as is standard daily rule for the first two weeks after starting station residency

Afterwards, the FE-2 performed the regular monthly & quarterly maintenance of the TVIS (Treadmill with Vibration Isolation & Stabilization), inspecting the condition of harnesses, belt slats, corner bracket ropes, IRBAs (Isolation Restorative Bungee Assemblies) and gyroscope wire ropes for any damage or defects, lubricating as required plus recording time & date values.

Malenchenko completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Later, Yuri conducted the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Working off his “available time” discretionary task list, the FE-1 performed the

regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder).

Also from the voluntary task list, Yuri supported the BIO-5 Rasteniya-2 ("Plants-2") experiment, which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}), by checking status and taking photographs. The crewmembers performed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, the CDR transferred the crew's exercise data file to the MEC laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

After setting up and activating the VDS MPC (Video Distribution System/Multi-Purpose Converter) with its four downlinks to allow the ground to receive HDTV (high-definition TV) downlink, the crew at 11:00am sent down two PAO TV messages for recording and later playback, one for Yuri's Night at NASA ARC (Ames Research Center), the other for the annual "VEISHEA" celebration at Iowa State University (ISU). Later (~11:35am), the MPC was powered off again. *[The annual Yuri's Night Celebration, held around the world on 4/12, commemorates the anniversary of Yuri Gagarin's launch on April 12, 1961 to become the first human in space, and the maiden flight of the Space Shuttle "Columbia" with John Young & Bob Crippen twenty years later – on April 12, 1981. ISU's "VEISHEA" event is an annual celebration held each spring and one of ISU's oldest traditions. The name VEISHEA combines the first letters of the colleges at the origin of VEISHEA in 1922: Veterinary Medicine, Engineering, Industrial Science, Home Economics, Agriculture. ISU also recognized Clay Anderson as a distinguished alumnus.]*

At ~4:20am EDT, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~5:05am, the FE-1 linked up with TsUP-Moscow stowage specialists via S-band to conduct the weekly IMS tagup, discussing stowage issues and equipment locations.

At ~9:00 am, Whitson and Reisman had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which

displays the uplinked ground video on the SSC-10 laptop).
At ~9:50am, the ISS crew held its weekly teleconference with ISS Program Management at JSC/Houston via
Private S/G2, S-band/audio.

At ~4:20pm, the crewmembers will convene for their standard bi-weekly teleconference with the JSC Astronaut Office (Steve Lindsey), via S-band S/G-2 audio & phone patch.

WDS Update: An updated Water Delivery System "cue card" was uplinked for the crew's reference, which includes the five CWCs that were transferred from Endeavour during 1J/A. *[The new card (16-0018Z) lists 39 CWCs (~1551.8 L total) for the four types of water identified on board: technical water (871.5 L, for Elektron, flushing, hygiene), potable water (647.2 L), condensate water (27.3 L), waste/EMU dump and other (5.8 L). Of the 39 containers, 15 CWCs with technical water (640.5 L) cannot be used until cleared for* Wautersia *bacteria, and 4 CWCs with potable water (176.3 L) are not cleared for use pending analysis of samples returned on 1J/A.]*

ATV Update (Flight Day 18): Early yesterday morning, ATV "Jules Verne" departed its parking orbit 2000 km in front of ISS, beginning to phase back to the Rendezvous Initiation point in preparation for ATV Demo Day 1 tomorrow (3/29). The ATV performed the following three maneuvers, all of which were reported to be nominal:

- TA1: start 1:59:37am EDT, delta-V: 1.50 m/s
- TA2: start 2:44:45am, delta-V: 3.24 m/s
- TA3: start 3:28:25am, delta-V: 1.55 m/s.

In addition, the ISS crew completed two of the ATV rendezvous on-board training sessions yesterday and another one today.
The ATV-CC continues to see higher than expected power consumption from the pressurized module shell heaters and is working to identify the reason. The spacecraft is being controlled by ESA's ATV-CC/Toulouse in France, working with TsUP-Moscow and MCC-Houston. On Demo Day 2 (3/31), the ATV begins approaching the ISS from two miles away, maneuvering with a series of engine firings to about 10 m (36 ft) from the station before the ISS crew sends an abort command to move the ATV away from the complex. These maneuvers will test all ATV systems that are required for a safe automated linkup to the ISS three days later (4/3) by means of the ASN PCE (Proximity Communications Equipment) in the SM, or manually as backup.

CEO photo target uplinked for today was Tropical Cyclone Pancho, NW Australia *(DYNAMIC EVENT: Maximum sustained winds predicted to be 65kt, storm tracking*

almost due south. Looking right of track for the eye. Shooting obliques to acquire the very long cloud feeder bands, especially right of track. Short lens settings probably allowed most of the storm to be captured in single views), Patagonian Glaciers *(there was a reasonable chance for clear weather on the dry side [east side] of the Southern Andes Mts. Looking left of track to shoot smaller glacier tongues),* and Pilcomayo River dynamics, N Argentina *(a mapping swath of 400-mm images was requested, looking left of track [for 30–60 secs]—to show the highly complex modern and past stream channel patterns on this largest "river fan" on Earth. These patterns have interesting similarities to "channel" patterns on Mars, for which they are being used as analogs in ongoing research)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:38am EDT [= epoch]):*
Mean altitude -- 340.1 km
Apogee height -- 340.8 km
Perigee height – 339.4 km
Period -- 91.34 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0001054
Solar Beta Angle -- 43.7 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 102 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53579

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch - ~7:16am *(CDR Sergei Volkov, FE Oleg Kononenko, SFP Yi So-yeon)*
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~8:43am
04/12/08 -- **Cosmonautics Day**, with **Yuri's Night** (check out http://www.yurisnight.net/2008/)
04/19/08 -- Soyuz TMA-11/15S undocking/landing (FGB nadir port)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS

05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
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11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
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1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.
Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/27/08
Date:	Thursday, March 27, 2008 2:09:18 PM
Attachments:	

ISS On-Orbit Status 03/27/08

All ISS systems continue to function nominally, except those noted previously or below. *Welcome back, Endeavour!*

STS-123/Endeavour returned to Earth last night after 15d 18h 11m in space, i.e., the longest Shuttle mission to ISS so far, touching down at KSC on the second opportunity at 8:39pm EDT, after 250 orbits & 6.6 million miles (first opportunity waived off due to cloud layer). *[During the perfectly executed ISS 1J/AE mission, its seven-member crew conducted a record five EVAs, delivered & installed the JAXA JLP (Japanese Experiment Module Experiment Logistics Module Pressurized Section) and the Canadian SPDM Dextre, brought up new Expedition 16 crewmember Garrett Reisman and returned his predecessor Léopold Eyharts who spent 48 days in space (44 aboard the station). It was the 122nd flight of a Space Shuttle, the 25th Shuttle mission to visit the station, the 21st for Endeavour and the second of six Shuttle missions planned for 2008. Next up: STS-124/Discovery/1J on 5/25 with JAXA's JEM Pressurized Module "Kibo", racks & the JEM RMS.]*

Before breakfast, CDR Whitson, FE-1 Malenchenko and FE-2 Reisman began their workday with the periodic session of the Russian biomedical routine assessments PZEh-MO-7/Calf Volume Measurement and PZEh-MO-8/Body Mass Measurement (sixth for CDR & FE-1, first for FE-2), using the IM mass measurement device which Yuri Malenchenko afterwards broke down for stowage. *[Calf measurements (left leg only) are taken with the IZOG device, a custom-sewn fabric cuff that fits over the calf, using the knee and lower foot as fixed reference pints, to provide a rough index of deconditioning in zero-G and effectiveness of countermeasures. For determining body mass in zero-G, where things are weightless but not massless, the Russian IM "scales" measure the inertial forces that arise during the oscillatory motion of a mass driven by two helical metering springs with known spring constants. By measuring the time period of each oscillation of the unknown mass (the crewmember) and comparing it to the period of a known mass, the crewmember's mass is calculated by the computer and displayed.]*

The FE-1 performed the periodic servicing of the Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The regen process will be terminated before sleeptime, at ~3:15pm EDT. Regeneration of bed #2 follows tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods.]*

Whitson & Reisman each completed a run with the MedOps WinSCAT (Spaceflight Cognitive Assessment Tool) experiment by logging in on the MEC (Medical Equipment Computer) and performing the psychological evaluation exercise on the laptop-based WinSCAT experiment. It was Peggy's fifth and Garrett's first session. *[WinSCAT is a time-constrained questionnaire test of cognitive abilities, routinely performed by astronauts aboard the ISS every 30 days before or after the PHS (periodic health status) test or on special CDR's, crewmembers or flight surgeons request.]*

Peggy supported Garret's first session with the ELITE-S2 (Elaboratore Immagini Televisive - Space 2) payload by detaching the CEVIS (Cycle Ergometer with Vibration Isolation) from the ER3 (EXPRESS Rack 3) and moving it out of the field of view of the cameras crucial to of the experiment, which she set up for capturing Garrett's movement protocol. After powering up the IMU (Interface Management Unit) and calibrating the work area for the cameras (half of the work area facing one way, the other half facing the other way), the FE-2 had ~1.5 hrs to perform the test operations, with Whitson taking documentary photographs. Peggy later stowed the test camera and re-installed the CEVIS, while Garrett turned off the IMU. *[The Italian (ASI) experiment ELITE-S2 is a human motion analysis facility for technological characterization and potential application for multifactorial movement analysis, to study the connection between brain, visualization and motion in micro-G. By recording and analyzing the three-dimensional motion of astronauts, this study should help engineers apply ergonomics into future spacecraft designs and determine the effects of weightlessness on breathing mechanisms for long-duration missions. For each of three protocols (e.g., MOVE, IMAGINE), a set of body landmarks are identified and reflective markers are applied on the subject who then performs prescheduled movements with the index finger tips then returns to the initial position (for example, the subject has to reach and brush, without exerting forces). The video cameras trace the trajectories of the body parts of the astronaut catching the light reflected by the markers, thus recording the kinetic and trajectory data of the movement.]*

Whitson & Malenchenko had two hours between them to prepare for the computerized ATV Approach & Docking OBT (Onboard Training) simulation scheduled tomorrow. The detailed review focused on the R&D (Rendezvous &

Docking) timeline and on possible R&D malfunctions. A five-minute joint crew debriefing with the ground concluded the session.

In the Soyuz TMA-11/15S spacecraft, docked at the FGB nadir port, Yuri, Peggy and Garrett conducted the standard 30-min. fit check of the Kazbek couches, the contoured shock absorbing seats in the Descent Module. *[For the fit check, crew members removed their cabin suits and donned Sokol KV-2 suit and comm caps, got into in their seats and assessed the degree of comfort & uniform body support provided by the seat liner. Using a ruler, they then measured the gap between the top of the head and the top edge of the structure facing the head crown. The results were reported to TsUP. Kazbek-UM couches are designed to withstand g-loads during launch and orbital insertion as well as during reentry and brake-rocket-assisted landing. Each seat has two positions: cocked (armed) and noncocked. In cocked position, they are raised to allow the shock absorbers to function during touchdown. The fit check assures that the crewmembers, whose bodies gain in length during longer-term stay in zero-G, will still be adequately protected by the seat liners for their touchdown in Kazakhstan, either emergency or regular return. Soyuz 15S will return on 4/19 with Malenchenko, Whitson and SFP Yi So-yeon.]*

Malenchenko unstowed a spare BRPK air/liquid condensate separator unit, flushed it out with clean water into an EDV (to remove any sediments that may have accumulated as a result of lengthy storage) and installed it in the BRPK-2 line of the SRV-K2M Condensate Water Recovery System. The old unit was discarded. *[The BRPK-1's separator was replaced on 3/16.]*

Reisman filled out the regular FFQ (Food Frequency Questionnaire), his second, on the MEC. *[On the FFQs, NASA/ESA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

Whitson performed the post-1J/A seal inspection on the Node-2 topside (zenith) hatch where the JLP module was berthed on 3/14.

Peggy also gathered measurements for another regular atmospheric status check for ppCO_2 (pp Carbon Dioxide), using the hand-held CDMK (CO_2 Monitoring Kit, #1002). Batteries were to be replaced if necessary. *[Purpose of the 15-min activity is to trend with MCA (Major Constituents Analyzer), i.e., to correlate the*

hand-held readings with MCA measurements. CDMK reading in the SM was 0.36; in Lab 0.36, and in COL 0.35.]

Malenchenko completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Later, Yuri conducted the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The FE-1 supported the BIO-5 Rasteniya-2 ("Plants-2") experiment, which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}), today by downlinking the accumulated pictures to the ground. Working off his “available time” task suggestion list, Malenchenko also serviced the experiment by recharging the water tank of the greenhouse.

The CDR conducted the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated “cue cards” based on the crew’s water calldowns are sent up every other week. The current cue card (16-0018Y) lists 37 CWCs (~1483.4 L total) for the four types of water identified on board: technical water (800.4 L, for Elektron, flushing, hygiene), potable water (647.2 L), condensate water (32.3 L), waste/EMU dump and other (3.7 L). Of the 37 containers, 13 CWCs with technical water (569.4 L) cannot be used until cleared for* Wautersia *bacteria, and 4 CWCs with potable water (176.3 L) are not cleared for use pending analysis of samples returned on 1J/A.]*

FE-2 Reisman relocated an “elephant trunk” air duct segment from the A/L CCAA (Airlock Common Cabin Air Assembly) air conditioner outlet to the IMV (Intermodular Ventilation) inlet.

Garrett, as Leo before him, also had 60 minutes for himself for general orientation (station familiarization & acclimatization), as is standard daily rule for the first two weeks after starting station residency.

Yuri Malenchenko had an hour set aside for his end-of-increment cleanup and

departure preparations. *[Instructions on packing of return items and a keep vs. trash list were uplinked for assisting Yuri and Peggy in their preparing for their return in the severely downmass-limited Soyuz Descent Module. Trashed items will be stowed in the Orbital Module, to be separated along with the Instrumentation/ Propulsion Module prior to atmospheric entry.]*

The crewmembers performed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Peggy transferred the crew's exercise data file to the MEC laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

As suggested on his "available time" discretionary task list, Yuri performed the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder).

ATV Update (Flight Day 18): Early this morning, ATV "Jules Verne" departed its parking orbit 2000 km in front of ISS. A three-burn sequence raised the ATV orbit above and behind the station orbit in preparation for Demo Day 1 on 3/29 (Saturday). The spacecraft is being controlled by ESA's ATV-CC/Toulouse in France, working with TsUP-Moscow and MCC-Houston. On Demo Day 2 (3/31), the ATV begins an approach to the station from two miles away, maneuvering with a series of engine firings to about 10 m (36 ft) from the station before the ISS crew sends an abort command to move the ATV away from the station. These maneuvers will test all ATV systems that are required for a safe automated linkup to the ISS three days later (4/3) by means of the ASN PCE (Proximity Communications Equipment) in the SM, or manually as contingency.

Columbus Update: COL-CC/Oberpfaffenhofen continues troubleshooting the COL (Columbus Orbital Laboratory) condensate water removal problem. Troubleshooting is also underway on the FSL (Fluid Science Laboratory) and BIOLAB payloads. The health check on the FSL fiber optic cable was successful – no damage detected. For BIOLAB, safety paperwork is in work for troubleshooting the locking pin, removing it and bringing it down in Soyuz 15S.

VolSci (Voluntary Science) Update: Corrective assessment by the ground is underway on the SLAMMD (Space Linear Acceleration Mass Measurement Device) equipment on the HRF1 (Human Research Facility 1) rack, for which CDR Whitson

was unable yesterday to establish communications between the payload laptop and the SLAMMD hardware.

SARJ Photography Update: Preliminary analysis of the Solar Alpha Rotary Joint photographs taken by the EVA crew during 1J/A indicate that the suspected "divot" may actually not be a divot; it also may not have increased in size since first seen during the US EVA-14, as first thought. The planned SARJ Autotrack test was not performed.

BGA Latching Issue: During the recent Shuttle undocking, BGA (Beta Gimbal Assembly) 2B latching for feathering in the automatic mode took three attempts until latch #2 locked properly. Later, unlatching for unfeathering was successful only on the second attempt. Latching/unlatching can also be performed manually as backup. Teams are assessing for future operations. Both issues are understood and documented.

CEO photo target uplinked for today was **Lake Eyre, Australia** *(Lake Eyre is a large, usually dry lakebed in south-central Australia and the lowest part of a larger basin that drains nearly a seventh of the continent. It has a complex cycle of filling and drying, not completely linked to the ENSO [El Nino-Southern Oscillation Cycle]. As we have entered a moderate La Nina this winter and have no recent photographs, researchers would like some baseline imagery of conditions in and around the lake. The ISS pass was to the NE of the lake in afternoon sun. As the station crossed south-central Australia from the SW, the crew was to look right of track for context views in mid-afternoon sun),* **Tropical Cyclone Pancho** *(DYNAMIC EVENT: This has been active tropical weather season for the southeastern Indian Ocean. This late-season storm is forecast at the time of the ISS pass to be a Category 2 storm near 19.5S 105.5E and moving southward well off the coast of northwestern Australia. As ISS approached the coast from the SW in late afternoon, the crew was to look for Pancho well to the left of track, using the short lens settings and trying to capture images of the entire storm system),* and **S. Georgia/S. Sandwich** *(the South Georgia Island is an arching, mountainous and glaciated island that lies about 860 miles ESE of the Falkland Islands. The South Sandwich Islands form a separate island group and are to the SE. Weather is marginal, but the crew was asked to try for detailed views of the glaciers on the north coast of South Georgia, also to look for views of the reported numerous ice fragments from the recent breakup of the mega-iceberg A53a to the north and east of the island).*

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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Mean altitude loss in the last 24 hours -- 25 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53561

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
03/27/08 -- ATV1 end of loiter; left parking point - ~2:00am;
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
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05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
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4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/26/08
Date:	Wednesday, March 26, 2008 1:42:26 PM
Attachments:	

ISS On-Orbit Status 03/26/08

All ISS systems continue to function nominally, except those noted previously or below. *Off-duty day for the Station crew.*

ISS crew is back on its regular work cycle: 2:00am – 5:30pm EDT.

For her VolSci (Voluntary Science) program today, CDR Peggy Whitson set up the SLAMMD (Space Linear Acceleration Mass Measurement Device) equipment on the HRF1 (Human Research Facility 1) rack, performed the scheduled checkout/ control run and took a body mass measurement, documenting the activities with digital still & video imagery for ground evaluation and finally disassembling the equipment again. *[SLAMMD provides an accurate means of determining the on-orbit mass of humans spanning the range from the 5th percentile Japanese female and the 95th percentile American male. The procedure, in accordance with Newton's 2nd Law of Motion, finds the mass by dividing force, generated by two springs inside the SLAMMD drawer, by acceleration measured with a precise optical instrument that detects the position versus time trajectory of the SLAMMD guide arm and a micro controller which collects the raw data and provides the precise timing. The final computation is done via portable laptop computer with SLAMMD unique software. To calculate their mass, crewmembers wrap their legs around a leg support assembly, align the stomach against a belly pad and either rest the head or chin on a head rest. For calibration, an 18-lbs. mass is used at different lengths from the pivot point, to simulate different mass values. Allowable crew mass range is from 90 to 240 lbs.]*

As second VolSci activity on her off-duty day, Whitson powered on the USND (Ultrasound) LITE gear with its TDI (Tissue Doppler Imaging) equipment & the Cooling Stowage Drawer on HRF-1 and performed a functionality checkout, monitored by the ground via Ku- & S-band. The payload was then deactivated again and stowed away.

After setting up the ELITE-S2 (Elaboratore Immagini Televisive - Space 2) payload in the ER2 (EXPRESS Rack 2) yesterday, FE-2 Reisman today reviewed updated crew procedures for the experiment and discussed particulars of the upcoming ops in conference with the PD (Payload Developer & POIC (Payload Operations & Integration Center). Afterwards, Garrett & Peggy routed the connecting data & power cables, configured the supporting laptop, set up the video cameras for calibrating the work area, and activated the experiment's IMU (Interface Management Unit), later powering it off again. *[The Italian (ASI) experiment ELITE-S2 is a human motion analysis facility for technological characterization and potential application for multifactorial movement analysis, to study the connection between brain, visualization and motion in micro-G. By recording and analyzing the three-dimensional motion of astronauts, this study should help engineers apply ergonomics into future spacecraft designs and determine the effects of weightlessness on breathing mechanisms for long-duration missions.]*

Yuri Malenchenko & Peggy Whitson updated the relevant crew procedures documentation for the upcoming ATV activities, printing out new ATV ODF (Operations Data File) pages for replacing corresponding pages in two procedures books (ATV Rendezvous Docking & Undocking Book & Systems Operations Book).

After Houston flight controllers deactivated the CDRA (Carbon Dioxide Removal Assembly) during last night (10:30pm-3:30am EDT) and cooling is no longer required, Garrett Reisman disconnected the ITCS LTL QD (Internal Thermal Control System/Low Temperature Loop/Quick Disconnect) jumper to the CDRA rack (loc. LAB1D6).

In the Service Module (SM), Malenchenko took readings of potentially harmful atmospheric contaminants with the CMS (Countermeasure System) part of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, which uses preprogrammed microchips to measure H_2CO (Formaldehyde, methanal), CO and NH_3 (Ammonia), taking one measurement per microchip;

Reisman conducted the periodic checkup on active U.S. payloads, i.e., cleaning the ANITA (Analyzing Interferometer for Ambient Air) inlet plus inspecting and filter cleaning of the CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) incubator payload. *[The CGBA incubator is controlled from the ground, with automatic video downlinked to Earth. ANITA continues to collect data every six seconds and downlinks the data daily to the ground team. ANITA monitors low levels of potential gaseous contaminants in the ISS cabin atmosphere with a capability of simultaneously monitoring 32 gaseous contaminants. The experiment is testing the accuracy and reliability of this technology as a potential next-*

generation atmosphere trace-gas monitoring system for ISS and future spacecraft. This is a cooperative investigation with ESA.]

Afterwards, Garrett also completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

The crewmembers performed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Peggy transferred the crew's exercise data file to the MEC (Medical Equipment Computer) laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Working off his "available time" task suggestion list, Malenchenko performed the daily monitoring, picture-taking and downloading on the BIO-5 Rasteniya-2 ("Plants-2") experiment. Today's task was extended to include recharging the water tank of the greenhouse. *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. During the duration of the BIO-5 experiment, students of the Moscow City Palace for Youth Creativity of the Meshchansky inter-regional center #15 in Moscow) and the Prince of Oldenburg Lyceum in St. Petersburg will be cultivating plants in parallel on the ground and conducting comparative observation of plant growth and development under gravity and zero-gravity conditions. They are receiving the photo images taken by Yuri.]*

Also listed for the FE-1 as a voluntary task was the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder).

At ~6:35am EDT, Garrett Reisman powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset & power

supply) and conducted at 6:40am a ham radio exchange with students at the NPO (Non-Profit Organization) "The Child Support Project" in Kyoto, Japan. Questions to Garrett were uplinked by ARISS (Amateur Radio on ISS) beforehand. *["Is there a temperature in space?"; "Why is it dark in space when the sun is there?"; "What is it like to have many mornings and nights in a day?"; "Is space food delicious?"; "How do you take pictures from space? Can you use an ordinary digital camera?"]*

STS-123/Endeavour Landing Look-ahead (today, EDT):
1:58pm: Deorbit Prep begins
2:13pm: Radiator Stow
3:04pm: Final payload deactivation
3:18pm: Payload bay door closing
4:50pm: IMU (Inertial Measurement Unit) align
3:28pm: Mission Control "Go" for Ops 3 software transition
3:38pm: GPC (General Purpose Computers) transition to Ops 3 for entry
4:33pm: Suit up
4:58pm: Seat Ingress
5:11pm: OMS (Orbital Maneuvering System) engine gimbal checks
5:25pm: APU (Auxiliary Power Unit) prestart
5:38pm: Mission Control "Go-No Go" for the deorbit burn
5:47pm: Maneuver to the Deorbit Burn Attitude
5:53pm: Single APU start
5:58pm: Deorbit burn (duration 2 min 51 sec/delta-V = 306.5 ft/sec)
6:33pm: Entry Interface (400,000 feet – range 4,959 st. mi.)
6:38pm: First Roll Command (to the left)
6:52pm: C-Band radar acquisition
6:54pm: First Roll Reversal (left to right)
7:02pm: HAC (Heading Alignment Circle) intercept (195 degree left overhead to Runway 15)
7:05pm: LANDING (249 orbits)

ATV Update (Flight Day 17): ATV "Jules Verne" continues nominal stationkeeping at the Parking point 2000 km in front of the ISS. Per the plan, the ATV did not perform any maneuvers. ATV is scheduled to leave the Parking point on 3/27 to start its ISS approach for its first Demo Day, with all demo objectives approved trilaterally (Europe, Russia, NASA). ATV-CC/Toulouse continues to see higher than expected power consumption from the pressurized module shell heaters and is working to identify the reason. Tomorrow and Friday, Yuri & Peggy are scheduled for two days of OBT (Onboard Training) to handle the ATV Approach & Docking next week (4/3): (1) tomorrow a thorough 2-hr review of OBT objectives (main rendezvous steps, possible malfunctions, new Rendezvous, Docking & Undocking RODF), including a crew debriefing with the ground, and (2) on 3/28 a series of simulation runs with a sophisticated simulator software on a laptop, covering a

selection of 10 scenarios of the approach & docking, quite similar to the SIMVOL control display used for KURS and TORU training.

Weekend Voluntary Science: For the next VolSci (Voluntary Science) program on Sunday (3/30), one option was proposed to Peggy & Garrett for their choice: to perform five surface sample analyses with the LOCAD-PTS (Lab-on-a-Chip Application Development – Portable Test System).

CEO photo target uplinked for today was **Mozambique** *(this target area is in the coastal plains of far southern Mozambique just north of the capital city of Maputo. Rapid development of this area is now being planned. To better monitor this change CEO researchers are seeking baseline, pre-development imagery. ISS approached from the SW in late afternoon light. Clear-to-partly cloudy weather was expected, and requested was an oblique mapping pass to the left of the orbit track using only short lens settings for contextual information. There are very few strong landmarks or visual features to guide the crew.*

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:11am EDT [= epoch]):*
Mean altitude -- 340.2 km
Apogee height -- 340.8 km
Perigee height – 339.6 km
Period -- 91.34 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0000838
Solar Beta Angle -- 52.5 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 60 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53547

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
03/26/08 -- STS-123/Endeavour deorbit (on Orbit 248; 5:58pm); landing @ KSC (7:05pm).
03/27/08 -- ATV1 end of loiter; leave parking point - ~2:00am;
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch - ~7:16am *(CDR Sergei Volkov, FE Oleg Kononenko, SFP Yi So-yeon)*

04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~8:43am
04/12/08 -- **Cosmonautics Day**, with Yuri's Night (check out http://www.yurisnight.net/2008/)
04/19/08 -- Soyuz TMA-11/15S undocking/landing (FGB nadir port)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
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09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
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1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/25/08
Date:	Tuesday, March 25, 2008 1:33:07 PM
Attachments:	

ISS On-Orbit Status 03/25/08

All ISS systems continue to function nominally, except those noted previously or below. *Off-duty day for the station crew.*

ISS work cycle today: Sleep 11:00pm (last night) –7:30am; wake 7:30am (this morning) –5:30pm.

STS-123/Endeavour and ISS are flying in separate orbits again *(Flight Day 15/16 for STS-123/1J/A)*

After final preparations on both sides of the hatches (closed yesterday on ISS side at 5:51pm EDT), Endeavour undocked last night at 8:25pm, 29 min late, from PMA-2 (Pressurized Mating Adapter 2) after a total docked time of 11d 20h 36m. *[For undocking, the station was turned from -XVV through ~180 deg to +XVV ZLV (+x-axis in velocity vector, z-axis in local vertical, i.e., flying Shuttle-leading again) at ~7:09pm, put briefly on free drift for the undocking, and then moded to 1J/A Stage attitude of +XVV TEA attitude. During pre-undock feathering & locking of the station's P6 solar arrays, latch #2 of the 2B BGA (Beta Gimbal Assembly) latched only at the third attempt, delaying the undocking by ~29 min.]*

After separation, Endeavour completed a 360-deg flyaround and obtained imagery of the ISS with the newly-delivered JLP (Japanese Experiment Module Experiment Logistics Module Pressurized Section) and SPDM (Special Purpose Dexterous Manipulator). *[JLP added approximately 2000 cubic feet of internal volume and 18,490 lb mass to the ISS; the SPDM added another 3440 lbm.]*

KSC landing is nominally expected on 3/26 (Wednesday) at ~7:05pm EDT. *[If the landing occurs as planned, STS-123 mission duration will be 15d 16h 37m, i.e., the longest Shuttle mission to ISS so far. Léopold Eyharts' total time in space will be 48 days, with 44 days on board ISS.]*

Before and during the undocking, FE-1 Malenchenko stood by at a laptop with a stopwatch to monitor the proper performance of automatic undocking software for the PMA-2 departure under Russian thruster attitude control. *[The procedure provides for the crewmember to take over the automatic operational attitude control sequence manually if the software does not resume control after the period of free drift a few minutes after physical separation.]*

FE-2 Garrett Reisman used the Kodak 760 digital camera and PD-100 camcorder to document the undocking, backing away & separation of the Endeavour.

Before Shuttle departure, a final 3.3 mmHg O_2 repress of the ISS stack was

performed using Shuttle oxygen.

After undocking, CDR Peggy Whitson depressurized the PMA-2 to prevent humidity condensation and pressure fluctuations. Leak checking by the CDR followed after the standard one hour. Afterwards, the necessary testing equipment was torn down.

Later, the CDR also powered down the Cupola RWS (Robotics Workstation) laptop.

Reisman set up the ELITE-S2 (Elaboratore Immagini Televisive - Space 2) payload in the ER2 (EXPRESS Rack 2), swapping the experiment's IMU (Interface Management Unit) with the ISIS (International Subrack Interface Standard) Drawer. *[The transfers involved moving ELITE-S2 from ER5 to ER2 and the ISIS Drawer from ER2 to ER5. Cables were not yet connected by the crew, remaining stowed (loc. LAB1S4-B1) until needed to perform the experiment. The Italian (ASI) experiment ELITE-S2 is a human motion analysis facility for technological characterization and potential application for multifactorial movement analysis, to study the connection between brain, visualization and motion in micro-G. By recording and analyzing the three-dimensional motion of astronauts, this study should help engineers apply ergonomics into future spacecraft designs and determine the effects of weightlessness on breathing mechanisms for long-duration missions.]*

The FE-1 completed the reconfiguration of the Russian telephone/telegraph subsystem (STTS) to its post-undocking settings, from its primary string back to nominal mode on the backup string. This also severed the VHS (UHF) channel to the receding Shuttle Orbiter and restored the RSA-2 S/G (Space-to-Ground) comm configuration on Panel 3. *[The "Voskhod-M" STTS enables telephone communications between the SM, FGB, DC1 Docking Compartment and U.S. segment (USOS), and also with users on the ground over VHF channels selected by an operator at an SM comm panel, via STTS antennas on the SM's outside.*

There are six comm panels in the SM with pushbuttons for accessing any of three audio channels, plus an intercom channel. Other modes of the STTS include telegraphy (teletype), EVA voice, emergency alarms, Packet/Email, and TORU docking support.]

After briefly activating the MKAM (Minimum Keep Active Monitor) fan in the JLP, Peggy Whitson relocated the module's PBA (Portable Breathing Apparatus) from the JLP to Columbus (because of long-term JLP ventilation deactivation), then removed & stowed the VCP J01 video cap at the Node-2 video port S3 (camcorder port), to allow camcorder ops within Node-2.

Malenchenko performed the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the FGB-to-Soyuz tunnel, and the FGB-to-Node passageway.

The crew went to sleep last night at ~11:00pm. After wake-up this morning (~7:30am EDT), the crew is having an off-duty day.

CDR Whitson started her day by completing another session with the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop, as suggested on her discretionary "job jar" task list. *[To monitor the crewmember's sleep/wake patterns and light exposure, Peggy wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

For her VolSci (Voluntary Science) program tomorrow, Whitson has selected the USND (Ultrasound) and SLAMMD (Space Linear Acceleration Mass Measurement Device) experiments. In preparation for the activities, Peggy today moved the USND hardware & cooling stowage drawer to a lower location within the HRF-1 (Human Research Facility 1) rack as a final troubleshooting step. SLAMMD files were loaded onto the HRF1 laptop already on 6/5/06. *[The actual checkout of the equipment is scheduled tomorrow with the powered SLAMMD activities. SLAMMD provides an accurate means of determining the on-orbit mass of humans spanning the range from the 5th percentile Japanese female and the 95th percentile American male. The procedure, in accordance with Newton's 2nd Law of Motion, finds the mass by dividing force, generated by two springs inside the SLAMMD drawer, by acceleration measured with a precise optical instrument that detects the position versus time trajectory of the SLAMMD guide arm and a micro controller which collects the raw data and provides the precise timing. The final computation*

is done via portable laptop computer with SLAMMD unique software. To calculate their mass, crewmembers wrap their legs around a leg support assembly, align the stomach against a belly pad and either rest the head or chin on a head rest. For calibration, an 18-lbs. mass is used at different lengths from the pivot point, to simulate different mass values. Allowable crew mass range is from 90 to 240 lbs.]

Later today, Yuri will perform the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Working off his “available time” task suggestions list, Malenchenko also is to –

- Conduct the daily IMS (Inventory Management System) maintenance, updating/editing of its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur),
- Support the BIO-5 Rasteniya-2 ("Plants-2") experiment, which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}), by monitoring the greenhouse, taking pictures and downloading them to the ground,
- Perform the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder), and
- Continue Progress 28P loading, with commensurate updates of the IMS.

Spaced over the day, the crewmembers are performing their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Peggy transfers the crew’s exercise data file to the MEC (Medical Equipment Computer) laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Whitson & Reisman are scheduled for their standard periodic PMC (Private Medical Conference) via S- & Ku-band audio/video.

Earlier today, at ~9:30am, Yuri Malenchenko had his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-9 laptop).

During crew sleep tonight, starting at 5:30pm, the ground will update the ISL (Integrated Station OpsLAN) Routers in the Lab & Node-2 with a new software configuration for both Switches A & B. They will be rebooted, taking the network temporarily off line.

Cabin Ventilation Update: After hatch closure, the CDR tore down the temporary 23-ft ventilation ducting from Node-2 to the Lab and reclosed panels. *[The air duct had been assembled from three separate pieces to help improve Shuttle air flow directly into the Lab for CO_2 removal.]*

JLP Update: The JLP experienced a failure of a GLA (General Luminaire Assembly, P2A), one of four lighting fixtures. Crew troubleshooting determined it was the BBA (Baseplate Ballast Assembly) that failed. There are no spare BBAs onboard ISS. *[Impact: "Just a little darker".]*

ATV Update (Flight Days 14, 15, 16): ATV "Jules Verne" continues nominal stationkeeping at the Parking point 2000 km in front of the ISS. Per the plan, the ATV did not perform any maneuvers. In addition, the SK2_1 & SK2_2 stationkeeping maneuvers that were planned for today (3/25) have been cancelled because they are not necessary for maintaining the Parking point. ATV is scheduled to leave the Parking point on 3/27 to start its ISS approach for its first Demo Day, with all demo objectives approved trilaterally (Europe, Russia, NASA). The IMMT (ISS Mission Management Team) this morning gave its Go for Demo Day 1 on 3/29. ATV-CC/Toulouse continues to see higher than expected power consumption from the pressurized module shell heaters and is working to identify the reason.

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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Mean altitude -- 340.3 km
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Eccentricity -- 0.0000845
Solar Beta Angle -- 53.3 deg (magnitude peaking)

Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 330 m
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Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
03/26/08 -- STS-123/Endeavour deorbit (Orbit 248; 5:59pm); landing @ KSC (7:04pm).
03/27/08 -- ATV1 end of loiter; leave parking point - ~2:00am;
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch - ~7:16am *(CDR Sergei Volkov, FE Oleg Kononenko, SFP Yi So-yeon)*
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09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
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11/26/08 -- Progress M-67/32P launch
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12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
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1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/24/08
Date:	Monday, March 24, 2008 1:21:09 PM
Attachments:	

ISS On-Orbit Status 03/24/08

All ISS systems continue to function nominally, except those noted previously or below. *STS-123-J/A Flight Day (FD) 14/15. Underway: Week 23 of Increment 16. (Yesterday, 3/23, was the birthday of Wernher von Braun who would have turned 96.)*

ISS crew sleep/wake cycle today: Sleep 3:15am–11:45am; wake 11:45am–11:00pm.

After wakeup yesterday, FE-2-16 Reisman had his third session with the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function), collecting dry saliva samples. *[INTEGRATED IMMUNE protocol requires the collection to occur first thing post-sleep, before eating, drinking and brushing teeth, and all samples are stored at ambient temperature. Along with NUTRITION (Nutritional Status Assessment), IMMUNE samples & analyzes participant's blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected at intervals during the collection day using a specialized book that contains filter paper, all stored at ambient temperature.]*

FE-2 Leo Eyharts continued his second session with the biomed experiment INTEGRATED IMMUNE, collecting wet saliva samples first thing in post-sleep and later transferring the samples to the Shuttle for return.

Later today, after wake-up, Eyharts switched to collecting dry saliva samples, continuing the IMMUNE collection throughout the day tomorrow on the Shuttle.

FE-1 Yuri Malenchenko began his “day” by attending to the current experiment session with the Russian/German TEKh-20 Plasma Crystal-3+ (Plazmennyi-Kristall/ PK-3+) payload, activating the turbopump in the Service Module (SM)’s Transfer Compartment (PkhO) for keeping the vacuum chamber (ZB) in the SM Work Compartment (RO) evacuated. Afterwards, Yuri performed the experiment in semiautomatic mode, with some manual control, then closed it down and transferred the collected data from HDD (Hard Disc Drive) for downlink to TsUP-Moscow. The turbopump was deactivated again this morning at ~3:10am EDT before sleeptime. *[Main objective of PK-3 is to study dust plasma wave propagation and dispersion ratio at a specified power of HF discharge, pressure, and a varied number of particles. The research was performed this time on particles of 3.42 micron (micrometer) diameter at pressures of 20, 40 & 60 Pa. The main purpose is to study the behavior of the structures in a constant electrical field of varying amplitudes and compare that with particle behavior when they are excited by a low-frequency alternating electrical field. Yuri’s task was to create a plasma-dust cloud with a small void in the center with the help of step-down power decrease of the RF generator. During the experiment the FE-1 performed a total of 4 runs.]*

In an attempt to increase Shuttle ventilation, CDR Peggy Whitson installed a 23-ft flexible ventilation duct, routing airflow from the Node-2 forward starboard endcone through the Node-2 aft endcone and into the Lab hatch, bypassing the IMV (Intermodular Ventilation) muffler. Ground specialists expect this configuration will improve Shuttle air flow directly into the Lab for CO_2 removal. After the installation, Peggy collected airflow and sound measurements for engineering analysis.

The CDR, with Garrett Reisman, also completed post-EVA clean-up activities, reconfiguring the Kodak 760 DCS (digital camera system) for nominal use, e.g., removing its thermal cover & flash attachment, and starting regeneration of the METOX (Metal Oxide) CO_2 filter canisters in the Airlock (A/L).

During the METOX “bake-out”, Whitson took temperature measurements around the regeneration oven and A/L CCAA (Common Cabin Air Assembly) using the Velocicalc instrument, for ground assessment. *[If the temperatures are favorable, this will alleviate the need to cold soak the A/L during METOX regenerations at high solar Beta angles (as is currently the case).]*

In the COL (Columbus Orbital Laboratory), FE-2 Eyharts conducted a status check on the MERLIN (Microgravity Experiment Research Locker Incubator II) cooler, then collected four (of eight) Experiment Containers of the WAICO-1 (Waving and Coiling of Arabidopsis Roots at Different g-levels #1) experiment from the BIOLAB TCU1 (Thermal Control Unit 1) and relocated them into the MERLIN incubator for

return to Earth on Endeavour. *[MERLIN's current temp at door closing: 4.3 deg C.]*

Eyharts also disconnected the IWIS (Internal Wireless Instrumentation System) between the accelerometer in the Shuttle and the RSU (Remote Sensor Unit) in the PMA-2 (Pressurized Mating Adapter 2) and transferred the RSU to temporary position in the Node-2 forward endcone. *[IWIS took structural dynamics measurements during yesterday's Russian thruster testing (11:52am-12:05pm).]*

FE-1 Malenchenko afterwards downloaded the IWIS data from the RSUs to an SSC (Station Support Computer) for subsequent downlink to the ground.

At the HRF1 (Human Research Facility 1) rack, Whitson deactivated the MedOps cardiac defibrillator and conducted its periodic checkout, which was to be recorded on video and later dumped to the ground (Last time done: 1/24/07). *[This routine maintenance task is scheduled as soon as possible from Expedition start and every 60 days thereafter. For the checkout, the defib is connected to the 120V outlet, equipped with its battery and then allowed to charge, for about five seconds, to a preset energy level (e.g., 100 joules). After the button-triggered discharge, a console indicator signals success or failure of the test. The pacing signal is downlinked via S-band for 1 min. The HRF was powered down afterwards.]*

The FE-1 performed the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the FGB-to-Soyuz tunnel, and the FGB-to-Node passageway. *[This is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).],*

Yuri also completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables plus the weekly collection of the toilet flush counter (SPK-U), water supply (SVO) readings and POTOK parameters for calldown to TsUP/ Moscow. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC (Contingency Water Container) from the Lab humidifier. Weekly SOZh reports (on Sundays) to TsUP/Moscow deal with number & dates of water and urine containers, counter readings of water consumption & urine collection, plus data and total operating time of the Russian POTOK-150MK (150 micron) air filter unit of the SOGS air revitalization subsystem.]*

The crewmembers completed most of their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2-16), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Peggy transferred the crew's exercise data file to the MEC (Medical Equipment Computer) laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Eyharts transferred his MEC exercise memory cards to the Shuttle for return.

MS3 Mike Foreman activated the RIGEX (Rigidizable Inflatable Get-Away-Special Experiment) payload. *[RIGEX is a self-contained, automated experiment intended to collect data on space inflated and rigidized structures in which inflatable tubes are heated and cooled to form structurally stiff tubes.]*

Working from the Russian "available time" suggestions list, Yuri Malenchenko performed the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder).

A second task list item for the FE-1 for FD14 was the daily monitoring, picture-taking and downloading for the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

At ~3:50pm, Garrett Reisman had his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-9 laptop).

Peggy Whitson & Leo Eyharts had their standard periodic PMC (Private Medical Conference) via S- & Ku-band audio/video.

At ~6:30pm, the CDR conducted the 15th weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC-10 (Station Support Computer 10)]*.

At ~11:20pm, the joint ISS & Shuttle crews participated in a well-done PAO TV news conference with U.S., Japan and France media.

Afterwards, the crewmembers joined for the traditional souvenir photographs, first all ten station residents together, then the seven Shuttle crewmembers.

Sleeptime for the ISS crew began this morning at 3:15am, for the Shuttle crew at 3:45am. For both crews workday started today at 11:45am EDT.

Main activities of today's workday (FD15):

- TEKh-20 Plasma Crystal-3+ (Plazmennyi-Kristall/PK-3+)PK-3 by FE-1 Malenchenko: turbopump activation at 11:45am, conduct experiment in semi-automatic mode, experiment deactivation & removal by 6:45pm;
- RIGEX deactivation by Mike Foreman;
- Urine transfer by Yuri from EDV-U containers (#349, #374) to the BV2 Rodnik water tank of Progress 28P for disposal *[pumping setup left in place for more urine transfers on 3/28]*;
- CDR Whitson removing the IWIS RSU from Node-2 (temporarily placed there earlier after its use in PMA-2 during the Russian thruster test);
- Whitson & Eyharts packing experiment samples from MELFI (Minus-Eighty Laboratory Freezer for ISS) in DCBs (Double Cold Bags, #1004, #1005)) plus their transfer to the Shuttle middeck;
- Standard maintenance/inspection of CEVIS by Peggy;
- Disassembly of the O_2 pre-breathe transfer equipment between Shuttle and ISS (Gorie/Johnson/Whitson);
- Final transfers as required (Foreman).

The traditional **Crew Farewell** ceremony will take place at ~5:20pm EDT, followed by air duct removal and hatch closure at ~5:50pm, handled on the ISS side by Peggy Whitson & Yuri Malenchenko. *[Afterwards, Gorie & Johnson switch attitude control authority of the mated stack from ISS CMG TA (Control Moment Gyroscope Thruster Assist) mode to Orbiter control.]*

Endeavour is scheduled to **undock** from ISS tonight at 7:56pm, two minutes after local midnight, after a total docked time of 11d 20h 7m. Sunrise will be at 8:13pm. After a one-orbit flyaround for photo imaging at 400-600 ft, starting at 8:25pm, final separation burn of Endeavour will be at 9:39pm (1.5 ft/sec, posigrade). Landing is set for Wednesday, 3/26, nominally at KSC at 7:04pm EDT. Total mission for STS-123-1J/A will then have been 15d 16h 36m. Léopold Eyharts' total time in space will be 48 days, with 44 days on board ISS.

ISS Crew Sleep Shift Planning: To synchronize the ISS crew's timeline with STS-123/1J/A docking and subsequent docked activities, Peggy's, Yuri's and Garrett's wake/sleep cycle underwent a number of shifts which started on 3/11. For the next two days, the wake/sleep shift schedule is as follows, getting the ISS crew back on

their regular schedule by Wednesday (all times EDT):

FD15	Wake: 11:45am (3/24) – 11:00pm (3/24) Sleep: 11:00pm – 7:30am (3/25)
FD16	Wake: 7:30am (3/25) – 5:30pm (3/25) Sleep: 5:30pm – 2:00am (3/26)

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 4:57am EDT [= epoch]):*
Mean altitude -- 340.6 km
Apogee height -- 341.5 km
Perigee height – 339.8 km
Period -- 91.35 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0001253
Solar Beta Angle -- 53.3 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.76
Mean altitude gain in the last 24 hours -- 90 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53514

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

- 3/24 (FD15) – STS-123/Endeavour undocking (~7:56pm)
- 3/26 (FD17) – STS-123/Endeavour deorbit (Orbit 248; 5:59pm); landing @ KSC (7:04pm).

03/27/08 – ATV1 end of loiter; leave parking point - ~2:00am;
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch - ~7:16am *(CDR Sergei Volkov, FE Oleg Kononenko, SFP Yi So-yeon)*
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~8:43am
04/19/08 -- Soyuz TMA-11/15S undocking/landing (FGB nadir port)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS
05/27/08 -- STS-124/Discovery/1J docking

06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/23/08
Date:	Sunday, March 23, 2008 3:04:45 PM
Attachments:	

ISS On-Orbit Status 03/23/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday - J/A Flight Day (FD) 13/14. Ahead: Week 23 of Increment 16.* *HAPPY EASTER! Congratulations, Shuttle & ISS crews: Five EVAs in a row, all successful. What a great Easter gift!*

*>>>>**Today at ~7:43am EDT, the ISS, specifically its FGB module, completed 53,500 orbits of the Earth, having covered a distance of 2.25 billion kilometers (1.4 billion st.miles) in 3411 days.** The 19,300 kg (42,600 lbs) Zarya ("Dawn") was launched on a Russian/Khrunichev Proton from Baikonur over nine years ago (11/20/1998) as the first element of the multi-national space station.<<<<*

Crew sleep/wake cycle today: Sleep 4:00am–12:30pm; wake 12:30pm–3:15am tomorrow.

EVA-5 was completed successfully by Bob Behnken & Mike Foreman in 6h 24m, accomplishing all of its objectives.
During the spacewalk, Behnken (EV1) & Foreman (EV2) –

1. Installed KAUs (Keep-alive Umbilicals) on the OBSS (Orbiter Boom Sensor System);
2. Stowed the OBSS on the ISS S0/S1 truss segments, powered it up and installed its cover *[OBSS will be returned on 1J]*;
3. Installed two MISSE-6 PEC (Materials International Space Station Experiment #6 Passive Experiment Containers) in the LWAPA (Light Weight Adapter Plate Assembly) on the Columbus EPF (External Payload Facility) & photographed LWAPA;
4. Inspected the Starboard SARJ (Solar Alpha Rotary Joint) covers, i.e., divot (depression) on cover 18 & photograph covers 16, 6, 8, 9 & 11 *[no debris or divots discovered here]*;

5. Clean up worksite & ingress.

Additionally, two get-ahead tasks were completed:

6. Installation of the five JLP (JEM Experiment Logistics Module Pressurized Section) & keel pin trunnion thermal covers, and
7. Stowing the general purpose cutters into the Airlock tool box #2.

Official start time of the spacewalk was 4:34pm EDT, about 49 min ahead of timeline, and it ended at 10:36am. Total EVA duration (PET = Phase Elapsed Time) was 6h 2min. It was the 109th spacewalk for ISS assembly & maintenance and the 81st from the station (59 from Quest, 22 from Pirs, 28 from Shuttle) totaling 498h 49min, the 13th for Expedition 16 (totaling 90h 57min) and the 10th so far this year. After today's EVA, a total of 139 spacewalkers (107 NASA astronauts, 21 Russians, and 11 astronauts representing Japan-1, Canada-4, France-1, Germany-2 and Sweden-3) have logged a total of 687h 11min outside the station on building, outfitting and servicing. It was also the 131st spacewalk involving U.S. astronauts.

After crew wakeup at ~12:30pm EDT yesterday, ending the 8.5-hr sleep period, the Airlock Crewlock (A/L CL) hatch was cracked at ~2:00pm for a hygiene break/with mask prebreathe for Behnken & Foreman after spending the night on 10.2 psi campout. Around 2:35pm, the hatch was closed again by Peggy Whitson, the IV (Intravehicular Crewmember) in charge, for EVA preparations in 10.2 psi, followed by EMU purge & prebreathe. Afterwards, the IV supported CL depressurization and EV1/EV2 egress (EMUs switched to batteries at 4:34pm).

As part of pre-EVA activities, FE-1 Malenchenko powered down the ham radio equipment in SM (Service Module) and FGB at ~1:53pm EDT to prevent RF interference with the EMUs during the spacewalk.

FE-1 Yuri Malenchenko began his “day” by attending to the current experiment session with the Russian/German TEKh-20 Plasma Crystal-3+ (Plazmennyi-Kristall/ PK-3+) payload, activating the turbopump in the Service Module (SM)’s Transfer Compartment (PkhO) for keeping the vacuum chamber (ZB) in the SM Work Compartment (RO) evacuated. The turbopump was then deactivated again this morning at ~3:55am EDT before sleeptime. *[Main objective of PK-3 is to study dust plasma wave propagation and dispersion ratio at a specified power of HF discharge, pressure, and a varied number of particles.]*

CDR Peggy Whitson conducted a thorough CO_2 and air exchange survey, measuring the airflow between the Lab and Node-2 IMV (Intermodular Ventilation) using the Velocicalc instrument and reporting the measurements to

MCC-Houston for analysis by ground specialists to aid in the CO_2 level troubleshooting. *[Measurements included CO_2 readings in the Lab, Node-2 aft and forward, Shuttle middeck, Shuttle flight deck & Shuttle A/L using the CDMK (Carbon Dioxide Monitor Kit). CO_2 data indicated a 1 mmHg partial pressure difference between the US Lab and Node-2 (3.13 & 4.2 mmHg, resp.). The Node-2 atmosphere is a mixture from Node-2, Columbus, JLP and Orbiter, while US Lab air is a mixture from US Lab, Node-1, and A/L. Ground teams have now developed an additional path for routing air, and the crew was given the Go this morning by the IMMT (ISS Mission Management Team) for installing a 23-ft IMV duct from Node-2 to the US Lab to facilitate CO_2 removal by the CDRA.]*

Later tonight, Whitson will install the 23 feet of flexible ventilation ducts from the Node-2 Forward Stbd End Cone IMV Return (bypassing the noise muffler) to the Node-2 Aft Hatch to aid in CO_2 removal. *[This configuration will bypass the stbd IMV return of the Node 2/Lab vestibule by returning air directly through the hatch.]*

FE-1 Malenchenko and FE-2 Leo Eyharts had several hours reserved for transferring more discarded cargo to the Progress 28P and stowing it according to detailed plan in the logistics spacecraft-turned-trash can, to be jettisoned on 4/7.

The FE-1 performed scheduled IFM (in-flight maintenance) on the SM's condensate water processor (SRV-K2M) by removing and replacing its water-conditioning unit purification columns (BK BKV). The old unit was disposed of in Progress 28P. (Last time done: 9/12/07) *[The SRV-K2M converts collected condensate into drinking water and dispenses the reclaimed water (warm and hot) for drinking and preparation of food and beverages.]*

Before breakfast and exercise, FE-2 Eyharts performed his second PHS (Periodic Health Status) w/Blood Labs examination. Garrett Reisman assisted in drawing blood and using the U.S. PCBA (Portable Clinical Blood Analyzer). The second part of PHS, Subjective Clinical Evaluation, was performed later in the day. *[The PHS exam, with PCBA analysis and clinical evaluation, is guided by special software (IFEP, In-Flight Examination Program) on the MEC (Medical Equipment Computer). While PCBA analyzes total blood composition, the blood's hematocrit is particularly measured by the Russian MO-10 protocol.]*

Eyharts also conducted his second session with the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member

Immune Function), collecting wet saliva samples first thing in post-sleep. *[IMMUNE protocol requires the collection to occur first thing post-sleep, before eating, drinking and brushing teeth, and all samples are stored at ambient temperature. Along with NUTRITION (Nutritional Status Assessment), INTEGRATED IMMUNE samples & analyzes participant's blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The liquid saliva collections require that the crewmembers soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations.]*

FE-2-16 Reisman had his third IMMUNE saliva collection this afternoon after wake-up (~12:30pm), this time dry samples. *[The dry samples are collected at intervals during the collection day using a specialized book that contains filter paper, all stored at ambient temperature.]*

The FE-1 performed the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the FGB-to-Soyuz tunnel, and the FGB-to-Node passageway. *[This is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).],*

Yuri also completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables plus the weekly collection of the toilet flush counter (SPK-U), water supply (SVO) readings and POTOK parameters for calldown to TsUP/ Moscow. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC (Contingency Water Container) from the Lab humidifier. Weekly SOZh reports (on Sundays) to TsUP/Moscow deal with number & dates of water and urine containers, counter readings of water consumption & urine collection, plus data and total operating time of the Russian POTOK-150MK (150 micron) air filter unit of the SOGS air revitalization subsystem.]*

Eyharts collected a fluid sample from the Columbus module ITCS (Internal Thermal Control System) and transferred it to the Shuttle for return for ground testing & analysis.

Meanwhile, Garrett worked on the MSG (Microgravity Glovebox) rack which Peggy & Leo had relocated yesterday from the US Lab to Columbus (loc. COL1F2), today mating its power, data & fluid connectors and activating the rack.

Reisman also updated the SODF (Station Operations Data File) Emergency Books with new crew procedural instructions delivered on STS-123.

In support of last night's EVA-5, after Johnson & Reisman powered up their robotarms, the SSRMS (Space Station Remote Manipulator System) grappled the OBSS from the SRMS (Shuttle RMS) and maneuvered it to the OBSS stow position, assisting the EVA crew in attaching the OBSS to the S0/S1 truss. *[SSRMS performance was nominal throughout the stow activities. This was the last planned MSS (Mobile Servicing System) operations for the docked mission.]*

After return and ingress of Bob & Mike from EVA-5 last night at 10:36pm, CDR Whitson took charge of the usual post-EVA activities, i.e., photographing the EMU/ spacesuit gloves and overgloves while still pressurized, recharging the EMUs with water from PWR (Payload Water Reservoir), then reconnecting the LTAs (Lower Torso Assemblies) to the EMUs and capping the UIA (Umbilical Interface Assembly), initiating the discharge/recharge process on the EMU batteries in the BSA (Battery Stowage Assembly), turning around the DCS-760 EVA camera (including downloading its EVSA and glove photographs), and reconfiguring EVA tools. *[Regeneration of the METOX (Metal Oxide) CO_2 filter canisters was deferred to tonight after the duct installation because of the ongoing CO_2 troubleshooting.]*

The crewmembers completed most of their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (FE-1, FE-2, FE-2-16), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Garrett transferred the crew's exercise data file to the MEC (Medical Equipment Computer) laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week). *[For Eyharts, it was the last exercise session onboard the station.]*

Sleeptime for the ISS crew began this morning at 4:00am, for the Shuttle crew at 4:30am. For both crews workday started today at 12:30pm EDT.

Main activities of current workday (FD14): Off-duty time, PK-3 (Malenchenko), handover activities (Eyharts/Reisman), joint crews news conference (11:18pm-11:58pm); joint crews photo shoot.

Transfer Status: No concern with middeck transfers – they are back on schedule. Overall transfer is 90% complete.

STS-123 Update: TPS inspection analysis is complete and Shuttle is Go for reentry on Wednesday.

ISS Crew Sleep Shift Planning: To synchronize the ISS crew's timeline with STS-123/1J/A docking and subsequent docked activities, Peggy's, Yuri's and Leo's wake/sleep cycle underwent a number of shifts which started on 3/11. For the next three days, the wake/sleep shift schedule is as follows, getting the ISS crew back on their regular schedule by Wednesday (all times EDT):

FD14	Wake: 12:30pm (3/23) – 3:15am (3/24) Sleep: 3:15am – 11:45am (3/24)
FD15	Wake: 11:45am (3/24) – 11:00pm (3/24) Sleep: 11:00pm – 7:30am (3/25)
FD16	Wake: 7:30am (3/25) – 5:30pm (3/25) Sleep: 5:30pm – 2:00am (3/26)

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:43am EDT [= epoch]):*
Mean altitude -- 340.7 km
Apogee height -- 341.5 km
Perigee height – 340.0 km
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Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0001101
Solar Beta Angle -- 52.4deg (magnitude increasing)
Orbits per 24-hr. day -- 15.76
Mean altitude gain in the last 24 hours -- 36 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53500

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

- 3/23 (FD14) – Day off; handover; PAO event; crew photo
- 3/24 (FD15) – STS-123/Endeavour undocking (~7:56pm)
- 3/26 (FD17) – STS-123/Endeavour deorbit (5:59pm); landing @ KSC (7:01pm).

03/23/08 -- ISS Russian Thruster Tests (11:52am-12:05pm)
03/27/08 – ATV1 end of loiter; leave parking point - ~2:00am;
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch - ~7:16am *(CDR Sergei Volkov, FE Oleg Kononenko, SFP Yi So-yeon)*
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~8:43am
04/19/08 -- Soyuz TMA-11/15S undocking/landing (FGB nadir port)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
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10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4

2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/22/08
Date:	Saturday, March 22, 2008 3:10:43 PM
Attachments:	

ISS On-Orbit Status 03/22/08

All ISS systems continue to function nominally, except those noted previously or below. *STS-123-1J/A Flight Day (FD) 12/13. Crew sleep/wake cycle today: Sleep 4:00am–12:30pm; wake 12:30pm–4:00am tomorrow.* ***HAPPY EASTER WEEKEND!***

After wakeup yesterday (~1:30pm EDT) and before breakfast, CDR Peggy Whitson completed another session with the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop, as suggested on her discretionary "job jar" task list. *[To monitor the crewmember's sleep/wake patterns and light exposure, Peggy wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

FE-2-16 Garrett Reisman performed his third session with the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function), collecting wet saliva samples first thing in post-sleep. FE-2 Leo Eyharts will have his second IMMUNE saliva collection later today after wake-up (~1:30pm). *[IMMUNE protocol requires the collection to occur first thing post-sleep, before eating, drinking and brushing teeth, and all samples are stored at ambient temperature. Along with NUTRITION (Nutritional Status Assessment), INTEGRATED IMMUNE samples & analyzes participant's blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected at intervals during the collection day using a specialized book that contains filter*

paper. The liquid saliva collections require that the crewmember soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations.]

Right after day's begin, FE-1 Yuri Malenchenko continued supporting the experiment session with the Russian/German TEKh-20 Plasma Crystal-3+ (Plazmennyi-Kristall/PK-3+) payload by activating the turbopump in the Service Module (SM)'s Transfer Compartment (PkhO) for keeping the vacuum chamber (ZB) in the SM Work Compartment (RO) evacuated. Afterwards, Yuri performed the experiment in semiautomatic mode, with some manual control, then closed it down and transferred the collected data from HDD (Hard Disc Drive) for downlink to TsUP-Moscow. The turbopump was deactivated this morning at ~3:55am EDT before sleeptime. *[Main objective of PK-3 is to study dust plasma wave propagation and dispersion ratio at a specified power of HF discharge, pressure, and a varied number of particles. The research is performed with particles of 6,81 microns (micrometer) diameter at pressures of 20, 40 & 60 Pa. The main purpose is to study the behavior of the structures when affected by a direct electric field of various amplitudes, and to compare their behavior when affected by low frequency alternating electric field. Yuri's task was to create a plasma-dust cloud with a small void in the center with the help of step-down power decrease of the RF generator. During the experiment the FE-1 performed a total of 3 runs.]*

CDR Peggy Whitson and FE-2 Leo Eyharts transferred the ER3 ARIS (EXPRESS-3 Active Rack Isolation System) Rack from the US Lab into the Columbus Module (location COL1A1). *[The activities included removal of the CEVIS (Cycle-Ergometer with Vibration Isolation System) from the front of the rack, disconnecting data, power and fluid rack umbilicals, disengaging the ARIS isolation plate from the rack standoff, removing both upper and lower snubber cups and detaching the rack for its transfer to COL1A1, after which the ARIS Rack was connected to COL umbilicals and the rack was successfully checked out.]*

Whitson & Eyharts also relocated the MSG (Microgravity Science Glovebox) from the US Lab (loc. LAB1S3) to Columbus (loc. COL1F2) after demating the rack umbilicals and releasing the K-BARs (Knee-Brace Assemblies) and pivot mechanisms. Final checkouts are scheduled for later in the week. *[The MSG transfer was originally scheduled for tomorrow (Sunday), but the crew decided to complete the move right away as a get-ahead to gain more time tomorrow.]*

Peggy and FE-2-16 Garrett Reisman did an outstanding job of installing & configuring additional flexible ventilation ducting from the Node-2 Stbd CCAA (Common Cabin Air Assembly) diffuser (outlet) to the Node-2 stbd aft return inlet. *[In response to slightly higher CO_2 concentrations in Node-2, Columbus & Shuttle*

than in the US Lab (a difference of ~1mmHg), probably as the result of inadequate mixing of ISS air flowing between Lab & Node-2, additional fans on Shuttle & Station were turned on, and the ducting installed by Peggy & Garrett. Whitson is scheduled tonight to conduct a CO_2 survey with CDMK (CO_2 Monitoring Kit) readings in Shuttle & Station to help the ground determine whether the workaround was successful. The decision was made by the IMMT (ISS Mission Management Team) to keep the 13-ft ducting on the ISS for future options, instead of returning it on 1J/A.]

FE-1 Malenchenko installed the IWIS (Internal Wireless Instrumentation System) accelerometer in the Shuttle for taking structural dynamics data during the upcoming Russian thruster firing (tomorrow, 3/23, at 11:52am-12:05pm EDT). The wireless RSU (Remote Sensing Unit) was temporarily set up in PMA-2 and the IWIS arrangement photo documented. RSU remains On.

The FE-1 conducted the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS (Russian Segment) hatchways, including the FGB-to-Soyuz tunnel, and the FGB-to-Node passageway. *[This is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).],*

In preparation for upcoming urine transfer to the Progress M-63 (28P) Rodnik BV1 water tank, Yuri set up the “plumbing” gear for the regular six compressor test activations to inflate and pressurize the cargo ship’s BV1 tank bladder. *[The pressurization of the collapsed bladder of the Rodnik water storage tank is conducted as a leak check, lasting ~4h 30min, preparatory to the liquid waste transfer to the tank for disposal. Each of the two spherical Rodnik tanks consists of a hard shell with a soft membrane (bladder) composed of elastic fluoroplastic. The bladder is used to expel water from the tank by compressed air pumped into the tank volume surrounding the membrane.]*

Leo Eyharts readied the equipment for the US PHS (Periodic Health Status) w/ Blood Labs assessment, to be performed by him tomorrow for the second time, using the PCBA (Portable Clinical Blood Analyzer). Preparations included an electronic function test and control analysis on the PCBA in preparation for tomorrow's blood analysis activity. *[The PHS exam, with PCBA analysis and subsequent clinical evaluation, is guided by special software (IFEP, In-Flight Examination Program) on the MEC (Medical Equipment Computer).*

Leo & Garrett, the two rotating ISS-16 Flight Engineers, had another 1h 10min set aside on their schedules for generic handover activities (where crewmembers are

scheduled together to complete various designated standard tasks for familiarizing the new station resident with procedures, caveats, etc.).

The crewmembers completed most of their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-2-16) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Reisman transferred the crew's exercise data file to the MEC laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Peggy & Garrett worked in the Airlock on preparations for tonight's EVA-5. The tasks included EMU (Extra Vehicular Mobility Unit) relocation, EMU METOX (Metal Oxide) and LiOH (Lithium Hydroxide) canister replacement, EMU battery replacement, configuring EVA tools, preparing the EL (Equipment Lock), readying the EVA digital camera and charging its battery.

Before going into their sleep period this morning, the joint crew had an hour to review timeline and procedures for EVA-5. Then, EV1 Bob Behnken & EV2 Mike Foreman entered the Airlock and began the 10.2 psi mask prebreathe and overnight campout procedures.

For both crews, workday began today at 12:30pm EDT. Behnken & Foreman are currently on "Campout" (*nachalo desaturatsiy* = desaturation start) in the A/L CL (Crewlock), after hatch closure this morning at ~3:30am. The two spacewalkers performed PBA (Portable Breathing Apparatus) mask prebreathe for denitrogenation, while readying their tools & equipment, then depressed the CL from 14.7 to 10.2 psi for their sleep period. After wakeup, ending the 8.5-hr sleep period, the CL hatch was cracked at ~1:25pm for a hygiene break/with mask prebreathe. Around 2:00pm, the hatch was closed again by Peggy Whitson (who supports all Campout preps and post-EVA activities as IV/Intravehicular Crewmember) for EVA preparations in 10.2 psi, followed by EMU purge & prebreathe. Afterwards, Peggy supports CL depressurization and EV1/EV2 egress.

EVA-5 Preview: Nominally, EVA-5 begins at ~5:23pm and lasts approximately 6h 30min, ending at ~11:53pm. Its major objectives are to:

1. Install KAUs (Keep-alive Umbilicals) on the OBSS (Orbiter Boom Sensor System), including APFR (Articulated Portable Foot Restraint) & stanchion/ avionics box;
2. Stow OBSS on ISS main truss (capturing inboard & outboard striker bars,

routing W21 cable harness for KAU heaters, installing OBSS cover, cleaning up);

3. Install MISSE-6 PEC containers (2) in LWAPA (Light Weight Adapter Plate Assembly) on the Columbus EPF (External Payload Facility), photograph LWAPA *[trying using the nominal ¼" PIP pins, or using 3/16" pins from Node-2 stbd vestibule, or go to contingency tie-down plan to avoid return of MISSE to the Shuttle]*;
4. Remove JLP (JEM Experiment Logistics Module Pressurized Section) trunnion covers;
5. Inspect Stbd SARJ (Solar Alpha Rotary Joint) covers, i.e., divot on cover 18 & photograph covers 16, 6, 8, 9 & 11), and
6. Clean up worksite & ingress.

Before the spacewalk, Leo & Garrett will set up the SSRMS (Space Station Remote Manipulator System) to support the EVA-5, first for OBSS grapple from the SRMS (Shuttle RMS), then hand off the OBSS to Behnken and Foreman during the KAU installation.

After post-EVA cleanup tomorrow morning, sleeptime for the ISS crew begins at ~4:00am, at ~4:30am for the Shuttle crew.

Transfer Status: Transfer is currently on schedule. As of yesterday (FD11), middeck cargo resupply is 92% complete, return cargo transfer is 69% complete, and overall transfer is 78% complete.

STS-123 Update: The OBSS inspection of the port & starboard WLE (Wing Leading Edge) and the Nose Cap RCC (Reinforced Carbon-Carbon) were completed today. Results will be reported at tomorrow's (FD13) MMT meeting.

ATV Update (Flight Day 13): ATV "Jules Verne" is at its Parking point, ~2000 km ahead of ISS. Next station-keeping maneuver is scheduled for 3/25 but may be cancelled since the orbit is stable.

ASN-M Update: RSC-Energia successfully switched the ASN-M Satellite Navigation System back to its primary NVM-1 Navigation Computer Module. No further activity planned. ASN-M is critically required for ATV docking, and both NVM computers must be functioning properly.

ISS Crew Sleep Shift Planning: To synchronize the ISS crew's timeline with STS-123/1J/A docking and subsequent docked activities, Peggy's, Yuri's and Leo's wake/sleep cycle has undergone a number of shifts which started on 3/11. For the next three days, the wake/sleep shift schedule is as follows (all times EDT):

FD13	Wake: 12:30pm (3/22) – 4:00am (3/23) Sleep: 4:00am – 12:30pm (3/23)
FD14	Wake: 12:30pm (3/23) – 3:30am (3/24) Sleep: 3:30am – 12:00pm (3/24)
FD15	Wake: 12:00pm (3/24) – 3:30am (3/25) Sleep: 3:30am – 12:00pm (3/25)

Weekly Science Update (Expedition Sixteen -- Week 22)

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Radiation measurements continue to be performed in the PIRS module. Radiation measurements continue to be performed in the PIRS module. Last memory card exchange took place at 3/14.

ANITA: Completed.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): In progress.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): In progress.

EuTEF (European Technology Exposure Facility): The EuTEF platform power feeders were de-activated in preparation of the EVA-3 on 3/18. A thermal clock was triggered and the final power down period was well below it. Status of the

various instruments: - DEBIE-2: the instrument showed regular link errors. It was subjected to troubleshooting during last couple of days. No conclusive recovery yet, and currently powered off; - DOSTEL: On-going science acquisition; - EuTEMP: Currently inactive as planned; - EVC: after a successful commissioning, some difficulty was encountered to get nominal images acquisition. Under investigation if the problem comes from EVC itself or from the Columbus HRM (High Rate Multiplexer); - EXPOSE: On-going science acquisition; - FIPEX: FIPEX showed Link Errors and was further troubleshooted this week. But progressively activating the sensors in order to create an overload of the communication channel – tests are on-going; - MEDET: On-going science acquisition; - PLEGPAY: The instrument was successfully re-commissioned on 3/19; - TRIBOLAB: in Stand-by mode, awaiting to start science acquisition after ATV docking on 4/3;

Fluid Science Laboratory (FSL): The FSL Facility is awaiting further troubleshooting after 1J/A departure.

GEOFLOW: Troubleshooting on FSL LAN cable repair was successfully performed. However damage on the MIL Standard bus connector was observed where two pins are missing. The FSL Rack was successfully activated on 3/19 after a swap of the active Columbus MIL Bus A for MIL Bus B. Additional anomalies have been encountered while checking out the ODM (Optical Diagnostic Module). Additional repair activities on the LAN and MIL Bus cables are currently planned for 3/22. Start of GEOFLOW is pending further FSL troubleshooting.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): In progress.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: “Peggy, thank you for unstowing Garrett’s saliva kit and having it ready for him to begin his collections. Garrett, you have nearly completed your early Integrated Immune session. Thanks for your participation in our study. Leo, thanks for your participation in your late Integrated Immune session. You will be performing your final saliva collections and blood draw on the Shuttle ride home. Have a safe trip back and we will see you on the ground.”

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Complete.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION/REPOSITORY: Planned.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): “Peggy, thanks for completing the additional Actiwatch download. After you complete the third week of requested Sleep logs, you will have two more download activities and an Actiwatch Doff. During your next download activity, you will download and initialize two Actiwatches (CDR and 1J/A) and initialize an Actiwatch for the KARI (South Korean) Space Flight Participant (Yi So-yeon). As always, the additional Sleep Logs are greatly appreciated.”

SOLAR (Solar Monitoring Observatory): Anomaly on platform pointing mode under further investigation. No science acquisition possible so far.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Complete.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: In progress.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): The 4 Experiment Containers (ECs) from Rotor A (0-g condition) were transferred to BIOLAB TCU (Thermal Control Unit) at +4degC on 3/12 to slow down the growth. Their transfer from BIOLAB TCU#1 to the MERLIN cooler unit is currently planned for 3/24. These 4 ECs will be downloaded on 1J/A. The 4 ECs of Rotor B are yet to be retrieved by the crew from the blocked Rotor B, after the 1J/A mission.

Anomalies during WAICO-Run#1 imply major impact on science return

CEO (Crew Earth Observation): Ongoing.

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:44am EDT [= epoch]):*
Mean altitude -- 340.7 km
Apogee height -- 341.7 km
Perigee height -- 339.7 km
Period -- 91.35 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0001538
Solar Beta Angle -- 50.8 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 235 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53485

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

- 3/22 (FD13) – EVA-5 to assemble OBSS KAU, stow OBSS, install MISSE-6s, remove JLP trunnion covers, inspect SARJ (~5:23pm)
- 3/23 (FD14) – Day off; MSG rack transfer to COL
- 3/24 (FD15) – STS-123/Endeavour undocking (~7:56pm)
- 3/26 (FD17) – STS-123/Endeavour deorbit (5:59pm); landing @ KSC (7:01pm).

03/23/08 -- ISS Russian Thruster Tests (11:52am-12:05pm)
03/27/08 – ATV1 end of loiter; leave parking point - ~2:00am;
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch - ~7:16am *(CDR Sergei Volkov, FE Oleg Kononenko, SFP Yi So-yeon)*
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~8:43am
04/19/08 -- Soyuz TMA-11/15S undocking/landing (FGB nadir port)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS

05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/21/08
Date:	Friday, March 21, 2008 1:39:05 PM
Attachments:	

ISS On-Orbit Status 03/21/08

All ISS systems continue to function nominally, except those noted previously or below. *STS-123-1J/A Flight Day (FD) 11/12. Crew sleep/wake cycle today: Sleep 5:00am–1:30pm; wake 1:30pm–4:00am tomorrow.*

EVA-4 was completed successfully by Bob Behnken & Mike Foreman in 6h 24m, accomplishing most of its objectives.
During the spacewalk, Behnken (EV1) & Foreman (EV2) –

- Demonstrated an on-orbit heat shield repair technique using the T-RAD (Tile Repair Ablator Dispenser) to demonstrate an Orbiter tile repair DTO (Development Test Objective) in space. *[The spacewalkers tested STA-54, a pink putty-like material consisting of two compounds that are mixed together in a pressure-driven applicator gun just before they exit the nozzle. With Foreman working the applicator, the test was completed nominally, and the test samples were stowed in the TSA (Tool Stowage Assembly in the Orbiter PLB (Payload Bay) for return and analysis; results looked good];*
- Removed RPCM (Remote Power Controller Module) S02B-D on the S0 truss and replaced it with a new unit. *[Since the RPCM controls CMG-2 (Control Moment Gyroscope #2), circuitry had to be powered down and the CMG-2 removed from the steering law beforehand. After the successful R&R, the spacewalkers attempted several times to reconfigure the Z1 patch panel, a pre-requisite for powering the new RPCM, but were unable to do so due to tough-to-reach connectors which could not be unmated. The patch panel reconfiguration currently remains incomplete, but there are no impacts to current operations];*
- Inspected the Z1 truss toolbox for MMOD (Micrometeoroid/Orbital Debris) damage and noticed several “pits”. *[Video imagery will be assessed by specialists];*
- Released Node-2 Port ACBM (Active Common Berthing Mechanism) launch locks in preparation for berthing the JEM (Japanese Experiment Module) module “Kibo” on Flight 1J next May;

- Removed the remaining SPDM OTCM-2 (Special Purpose Dexterous Manipulator/ORU Tool Changeout Mechanism #2) thermal covers, reconfigured some of the wrist blankets and flaps, and inspected the Shoulder Roll joint of SPDM Arm #2 for possible MLI (Multi-Layered Insulation) interference. None was seen. *[WVS (Wireless Video System) helmet cam video was also obtained for ground analysis.]*

Additionally, two get-ahead tasks were completed:

- Searching for a misplaced PIP (Push-in-Place) pin that was lost during EVA-2 on Flight 10A in a CBM. *[Ground controllers opened and closed the CBM petals, but the PIP pin was not located despite search of the entire location]*;
- Releasing the Node-2 Nadir CBM launch locks in preparation for "Leonardo" MPLM (Multi-Purpose Logistics Module) docking later in the year (STS-126/ULF-2).

Besides the aborted patch panel reconfiguration, also not accomplished was the get-ahead of removing the JLP (JEM Experiment Logistics Module Pressurized Section) trunnion covers.

Official start time of the spacewalk was 6:04pm EDT, about 24 min ahead of timeline, and it ended at 12:28am. Total EVA duration (PET = Phase Elapsed Time) was 6h 24min. It was the 108th spacewalk for ISS assembly & maintenance and the 80th from the station (58 from Quest, 22 from Pirs, 28 from Shuttle) totaling 492h 47min, the 12th for Expedition 16 (totaling 84h 55min) and the 9th so far this year. After today's EVA, a total of 137 spacewalkers (105 NASA astronauts, 21 Russians, and 11 astronauts representing Japan-1, Canada-4, France-1, Germany-2 and Sweden-3) have logged a total of 681h 9min outside the station on building, outfitting and servicing. It was also the 130th spacewalk involving U.S. astronauts.

After crew wakeup at ~1:30pm EDT yesterday, ending the 8.5-hr sleep period, the Airlock Crewlock (A/L CL) hatch was cracked at ~2:55pm for a hygiene break/with mask prebreathe for Behnken & Foreman after spending the night on 10.2 psi campout. Around 3:05pm, the hatch was closed again by Peggy Whitson, the IV (Intravehicular Crewmember) in charge, for EVA preparations in 10.2 psi, followed by EMU purge & prebreathe. Afterwards, the IV supported CL depressurization and EV1/EV2 egress (EMUs switched to batteries at 6:04pm).

As part of pre-EVA activities, FE-1 Malenchenko powered down the ham radio equipment in SM (Service Module) and FGB at ~2:40am EDT to prevent RF interference with the EMUs during the spacewalk.

Before her breakfast and EVA-support activities as IV, CDR Peggy Whitson

completed another session with the SLEEP experiment (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop for downlink, as suggested on her discretionary "job jar" task list. During the day, the ground downlinked the Actiwatch data file from the HRF-1 for medical analysis and planning report preparation.

[To monitor the crewmember's sleep/wake patterns and light exposure, Peggy wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]

FE-1 Yuri Malenchenko began his "day" by attending to the current experiment session with the Russian/German TEKh-20 Plasma Crystal-3+ (Plazmennyi-Kristall/ PK-3+) payload, activating the turbopump in the Service Module (SM)'s Transfer Compartment (PkhO) for keeping the vacuum chamber (ZB) in the SM Work Compartment (RO) evacuated. The turbopump was then deactivated again this morning at ~4:55am EDT before sleeptime. *[Main objective of PK-3 is to study dust plasma wave propagation and dispersion ratio at a specified power of HF discharge, pressure, and a varied number of particles.]*

Afterwards, Malenchenko terminated his MBI-12 SONOKARD experiment session (his 12th), started last night, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

FE-2-16 Garrett Reisman performed his second session with the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function), collecting wet saliva samples first thing in post-sleep. *[IMMUNE protocol requires the collection to occur first thing post-sleep, before eating, drinking and brushing teeth, and all samples are stored at ambient temperature. Along with NUTRITION (Nutritional Status Assessment), INTEGRATED IMMUNE samples & analyzes participant's blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints.*

The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected at intervals during the collection day using a specialized book that contains filter paper. The liquid saliva collections require that the crewmember soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations.]

In the SM, the FE-1 took another set of air readings to check for potentially harmful atmospheric contaminants with the CMS (Countermeasure System) part of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, which uses preprogrammed microchips to measure H_2CO (Formaldehyde, methanal), CO and NH_3 (Ammonia), taking one measurement per microchip;

Later, Malenchenko transferred CWC (Contingency Water Container) #1053 to the Russian Segment (RS) for the periodic (about twice a month) replenishing of the Elektron oxygen generator's water supply for electrolysis, filling the KOV thermal loops' EDV container. Once filled, the EDV was connected to the BPK transfer pump for processing. *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron shutdown.]*

CWCs with water from Endeavour's fuel cells were transferred to the ISS by Shuttle crewmembers.

MS3 Doi conducted cargo transfer activities between Shuttle and ISS, including updating the transfer list.

FE-1 Malenchenko completed his series of regular maintenance tasks for today, by -

- Continuing transferring and stowing discarded equipment & trash on Progress 28P,
- Performing routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables,
- Conducting the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS hatchways, including the FGB-to-Soyuz tunnel, and the FGB-to-Node passageway *[this is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).],*
- Completing the periodic collection & deletion of readings on the MOSFET (metal oxide semiconductor field-effect transistor) radiation sensor reader/

display of the RBO-3-2 Matryoshka-R antroph-amorphous (human torso) "phantoms" located inside the station for sophisticated radiation studies, collecting radiation measurements every 15 minutes around the clock;

- Continuing the transfer of potable water from the BV1 tank of Progress M-63/28P to EDV storage containers, begun earlier *[filling of the empty Progress BV1 & BV2 tanks with urine will be scheduled later],*
- Supporting the BIO-5 Rasteniya-2 ("Plants-2") experiment, which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}), by monitoring the greenhouse, taking pictures and downloading them to the ground, and, working from the Russian “available time” suggestions list,
- Performing the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder).

After return and ingress of Bob & Mike from EVA-4 this morning at 12:28am, CDR Whitson took charge of the usual post-EVA activities, i.e., photographing the EMU/ spacesuit gloves and overgloves while still pressurized, recharging the EMUs with water from PWR (Payload Water Reservoir), then reconnecting the LTAs (Lower Torso Assemblies) to the EMUs and capping the UIA (Umbilical Interface Assembly), initiating and monitoring the regeneration of the METOX (Metal Oxide) CO_2 filter canisters, initiating the discharge/recharge process on the EMU batteries in the BSA (Battery Stowage Assembly), turning around the DCS-760 EVA camera (including downloading its EVSA and glove photographs), and reconfiguring EVA tools.

FE-2 Leo Eyharts conducted the periodic checkup on active U.S. payloads, i.e., cleaning the ANITA (Analyzing Interferometer for Ambient Air) inlet plus inspecting and filter cleaning of the CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) incubator payload. *[The CGBA incubator is controlled from the ground, with automatic video downlinked to Earth. ANITA continues to collect data every six seconds and downlinks the data daily to the ground team. ANITA monitors low levels of potential gaseous contaminants in the ISS cabin atmosphere with a capability of simultaneously monitoring 32 gaseous contaminants. The experiment is testing the accuracy and reliability of this technology as a potential next-generation atmosphere trace-gas monitoring system for ISS and future spacecraft. This is a cooperative investigation with ESA.]*

A new voluntary task item added to the U.S. “job jar” task list for Peggy was to update the onboard reference “library” of CDs with new disks for the 1J/A Stage and

weed out outdated disks for discarding.

Eyharts & Reisman, the two rotating ISS-16 Flight Engineers, had another two hours set aside on their schedules for generic handover activities (where crewmembers are scheduled together to complete various designated standard tasks for familiarizing the new station resident with procedures, caveats, etc.).

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2-16), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Yuri transferred the crew's exercise data file to the MEC (Medical Equipment Computer) laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week). For Reisman, it was the first onboard CEVIS exercise session.

Sleeptime for the ISS crew began this morning at 5:00am, for the Shuttle crew at 5:30am. For both crews workday began today at 1:30pm EDT. Main activities of the ensuing day (FD12): Late Inspection (survey of Orbiter starboard & port wings plus nose cap), putting CMG-2 back into the steering law, transferring the U.S. EXPRESS Rack 3 to the Columbus module, preparations for EVA-5 on FD13 (Saturday, 3/22), and campout by Behnken & Foreman.

ATV Update (Flight Day 12): Yesterday (3/20), ATV "Jules Verne" continued nominal stationkeeping at the Parking point 2000 km in front of the ISS. Per the plan, no ATV maneuvers were performed. The first two (of four) stationkeeping maneuvers to maintain the Parking point, SK1_1 and SK1_2, were to take place today (3/21) at 9:14:38am and 9:49:28am, respectively. ATV is planned to leave the Parking point on 3/27 (1:58:33am EDT). As reported yesterday, ATV power consumption is slightly higher (200-300 W) than predicted. The current hypothesis is that one or two MLI (Multi-Layered Insulation) blankets may have been lost during launch or venting activities. At this point, there is no impact to nominal operations. However, it is possible that contingency battery operations could be affected by the additional Pressurized Module shell heater load. ESA is investigating options for confirming whether the MLI blankets are loose or missing.

ASN-M R&R Update: RSC-Energia has conducted several tests of the newly installed BSK Common Power Switching timer of the SUBK Onboard Complex Control System, switching from the ASN-M Satellite Navigation System's NVM-1 Navigation Computer Module to the second string, NVM-2. The tests were successful. Today, the ASN will be switched back to the primary NVM-1. ASN-M

is critically required for ATV docking, and both NVM computers must be functioning properly.

ISS Crew Sleep Shift Planning: To synchronize the ISS crew's timeline with STS-123/1J/A docking and subsequent docked activities, Peggy's, Yuri's and Leo's wake/sleep cycle has undergone a number of shifts which started on 3/11. For the next four days, the wake/sleep shift schedule is as follows (all times EDT):

FD12	Wake: 1:30pm (3/21) – 4:00am (3/22) Sleep: 4:00am – 12:30pm (3/22)
FD13	Wake: 12:30pm (3/22) – 4:00am (3/23) Sleep: 4:00am – 12:30pm (3/23)
FD14	Wake: 12:30pm (3/23) – 3:30am (3/24) Sleep: 3:30am – 12:00pm (3/24)
FD15	Wake: 12:00pm (3/24) – 3:30am (3/25) Sleep: 3:30am – 12:00pm (3/25)

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:33am EDT [= epoch]):*
Mean altitude -- 340.9 km
Apogee height -- 341.7 km
Perigee height -- 340.2 km
Period -- 91.35 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0001092
Solar Beta Angle -- 48.4deg (magnitude increasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 181 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53469

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

- 3/21 (FD12) – Late heat shield inspection w/OBSS; ER3 rack transfer to COL & mating
- 3/22 (FD13) – EVA-5 to assemble OBSS KAU & stow OBSS, install MISSE-6s, inspect SARJ (~5:23pm)
- 3/23 (FD14) – Day off; MSG rack transfer to COL
- 3/24 (FD15) – STS-123/Endeavour undocking (~7:56pm)
- 3/26 (FD17) – STS-123/Endeavour deorbit (5:59pm); landing @ KSC

(7:01pm).
03/14/08 -- ATV1 “Jules Verne” CAM (Collision Avoidance Maneuver) Demo, -5m/s, 4:00am-5:30am EDT;
03/19/08 -- ATV1 “Jules Verne” parking point (loiter) arrival 8:00am EDT ~1200 mi. in front of ISS;
03/27/08 – ATV1 end of loiter; leave parking point - ~2:00am;
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch - ~7:16am *(CDR Sergei Volkov, FE Oleg Kononenko, SFP Yi So-yeon)*
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~8:43am
04/19/08 -- Soyuz TMA-11/15S undocking/landing (FGB nadir port)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation

05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/20/08
Date:	Thursday, March 20, 2008 2:00:21 PM
Attachments:	

ISS On-Orbit Status 03/20/08

All ISS systems continue to function nominally, except those noted previously or below. *STS-123-1J/A Flight Day (FD) 10/11. Crew sleep/wake cycle today: Sleep 5:00am–1:30pm; wake 1:30pm–5:00am tomorrow. FD10 was off-duty for both crews.*

After wakeup yesterday at ~1:30pm EDT and before breakfast, CDR Peggy Whitson completed another session with the SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop, as suggested on her discretionary "job jar" task list. *[To monitor the crewmember's sleep/wake patterns and light exposure, Peggy wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Peggy also set up her current Actiwatch data in a data file for downlink from the HRF-1 for medical analysis and planning report preparation by the ground.

FE-2 Leo Eyharts performed his first session with the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function), collecting wet saliva samples first thing in post-sleep. FE-2-16 Garrett Reisman will have his second INTEGRATED IMMUNE saliva collection later today after wake-up (~1:30pm). *[IMMUNE protocol requires the collection to occur first thing post-sleep, before eating, drinking and brushing teeth, and all samples are stored at ambient temperature. Along with NUTRITION (Nutritional Status Assessment), INTEGRATED IMMUNE samples & analyzes participant's blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate*

an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected at intervals during the collection day using a specialized book that contains filter paper. The liquid saliva collections require that the crewmember soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations.]

Right after day's begin, FE-1 Yuri Malenchenko continued supporting the experiment session with the Russian/German TEKh-20 Plasma Crystal-3+ (Plazmennyi-Kristall/PK-3+) payload by activating the turbopump in the Service Module (SM)'s Transfer Compartment (PkhO) for keeping the vacuum chamber (ZB) in the SM Work Compartment (RO) evacuated. The turbopump was deactivated again this morning at ~4:55am EDT before sleeptime. *[Main objective of PK-3 is to study dust plasma wave propagation and dispersion ratio at a specified power of HF discharge, pressure, and a varied number of particles.]*

Eyharts & Reisman filled out the regular FFQ (Food Frequency Questionnaire), Leo's fifth, Garrett's first, on the MEC (Medical Equipment Computer). *[On the FFQs, NASA/ESA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. The FFQ is performed once a week to estimate nutrient intake from the previous week and to give recommendations to ground specialists that help maintain optimal crew health. Weekly estimation has been verified to be reliable enough that nutrients do not need to be tracked daily.]*

In the U.S. Airlock, CDR Whitson made preparations for tonight's EVA-4, initiating re-charge on two DCS-760 camera batteries for the EMU Prebreathe period. *[Using the camera's plugged-in battery charger, the charging process takes at least three hours.]*

The FE-1 conducted the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various Russian segment (RS) hatchways, including the FGB-to-Soyuz tunnel, and the FGB-to-Node passageway. *[This is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).]*

Yuri also completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water*

and EDV-U urine container, replacement of the KOV EDV for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]

Leo Eyharts & Garrett Reisman, the two rotating ISS-16 Flight Engineers, had 2h 15min set aside on their schedules for generic handover activities (where crewmembers are scheduled together to complete various designated standard tasks for familiarizing the new station resident with procedures, caveats, etc.).

Working from the Russian “available time” suggestions list, Yuri Malenchenko performed the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder).

A second task list item for the FE-1 for FD10 was the daily monitoring, picture-taking and downloading for the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2, FE-2-16), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Yuri transferred the crew’s exercise data file to the MEC laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

For Reisman, it was the first onboard TVIS exercise session. *[For the first seven TVIS runs, Garrett is using SPD (Subject Positioning Device) top assemblies to help get acclimated to running on the treadmill in the weightless environment. For keeping his exercise data file, Reisman selected his own PCMCIA memory card.]*

Eyharts prepared his video recording of yesterday’s treadmill exercise run for the ground to route & record it onto a VTR (Video Tape Recorder) for later downlink.

CDR Whitson set up the Node-2 camera to provide video of the JLP (JEM Experiment Logistics Module Pressurized Section) to the ground. Later she reinstalled the Node-2 cap to support Robotics ops TV coverage tonight.

Before going into their sleep period this morning, the joint crew had an hour to

review timeline and procedures for EVA-4. Afterwards, Leo & Garrett performed a Robotics operation, pre-positioning Arm-2 of the SPDM (Special Purpose Dexterous Manipulator) to bring its OTCM (ORU {On-orbit Replaceable Unit} Tool Changeout Mechanism) closer to the OTP (ORU Temporary Platform) to facilitate removal of its thermal sock blanket by the spacewalkers (a get-ahead task). *[Only a single-joint maneuver was required for the re-positioning.]*

At ~4:45am, shortly before sleep time, Yuri set up the Russian MBI-12 SONOKARD (Sonocard) payload and started his 12th experiment session, using a sports shirt from the SONOKARD kit with a special device in the pocket for testing a new method for acquiring physiological data without using direct contact on the skin. Measurements are recorded on a data card for return to Earth. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

For both crews, workday began today at 1:30pm EDT. Bob Behnken (EV1) & Mike Foreman (EV2) are currently on "Campout" (*nachalo desaturatsiy* = desaturation start) in the A/L CL (Crewlock), after hatch closure this morning at ~4:40am. The two spacewalkers performed PBA (Portable Breathing Apparatus) mask prebreathe for denitrogenation, while readying their tools & equipment, then depressed the CL from 14.7 to 10.2 psi for their sleep period. *[For the Campout, fresh METOX (Metal Oxide) canisters were installed in the A/L for CO_2 control.]*

After wakeup, ending the 8.5-hr sleep period, the Airlock Crewlock (CL) hatch will be cracked at ~2:13pm for a hygiene break/with mask prebreathe for Foreman & Behnken, after spending the night on 10.2 psi campout. Around 3:23pm, the hatch will be closed again by Peggy Whitson (who supports all Campout preps and post-EVA activities as IV/Intravehicular Crewmember) for EVA preparations in 10.2 psi, followed by EMU purge & prebreathe. Afterwards, Peggy supports CL depressurization and EV1/EV2 egress.

EVA-4 Preview: Nominally, EVA-4 begins at ~6:28pm and lasts approximately 6h 10min, ending at ~12:38am. Its major objectives are to:

1. Replace RPCM (Remote Power Controller Module) S02B-D on the S0 truss;
2. Conduct T-RAD (Tile Repair Ablator Dispenser) demo in the Shuttle PLB;
3. Release Node-2 ACBM (Active Common Berthing Mechanism) launch locks;
4. Perform get-ahead tasks (install covers on JLP stbd nadir/zenith trunnions,

port nadir/zenith trunnions and keel pin trunnion; remove OTCM-2 sock cover; inspect Z1 toolbox for any MMOD (Micrometeoroid/Orbital Debris) damage that may have been “collateral” to the D-handle impact, etc.); and

5. Clean up worksite & ingress.

After post-EVA cleanup tomorrow morning, sleeptime for the ISS crew begins at ~5:00am, at ~5:30am for the Shuttle crew.

Columbus Update:

- During EVA-4, a partial powerdown of the Columbus module is required (3:35pm-12:25am EDT), resulting in half of its lights switched off, IMV (Intermodular Ventilation) supply fan off, and ATU-2 (Audio Terminal Unit 2) off.
- BIOLAB: Further troubleshooting in work; will request space on 1J/A to return some items. Cold stowage of the samples in the TCU1 (Thermal Control Unit 1) is being monitored.
- FSL (Fluid Science Laboratory): Troubleshooting activities are on hold until after the 1J/A joint mission.
- SOLAR (Solar Monitoring Observatory): Powered and functioning nominal.
- EuTEF (European Technology Exposure Facility): Powered and functioning nominal.

ATV Update (Flight Day 11):

- Yesterday (3/19), ATV “Jules Verne” successfully performed five maneuvers, as follows:
    - TV2_1: began at 1:30:03am EDT, delta-V=2.15 m/s
    - TV2_2: began at 2:15:41am, delta-V = 2.14 m/s (the original TV2_2 was planned to be "no burn" (0 m/s) and was thus deleted; TV2_3 was re-named TV2_2)
    - IF1: began at 6:21:02am, delta-V = 0.14 m/s
    - IF2: began at 7:06:48am, delta-V = 0.02 m/s
    - IF3: began at 7:51:04am, delta-V = 1.32 m/s
- Based on ATV GPS (Global Positioning System) data, specialists estimate the post-maneuver state to have been within 100 m in semi-major axis of ATVCC/Toulouse prediction. In addition, NASA-GSFC successfully performed coherent TDRSS tracking before and after the maneuvers that confirmed the maneuver results. ATVCC reported that all maneuvers were nominal. Following the maneuvers, the ATV successfully arrived at the Parking point 2000 km in front of the ISS, where it is currently positioned.
- To maintain the Parking point, two stationkeeping maneuvers, SK1_1 & SK1_2, are planned for tomorrow (3/20) at 9:13:50am & 10:04:41am, respectively. ATV is scheduled to leave the Parking point on 3/27.
- TsUP-Moscow also tested the SM Kurs-P system today in preparation for

ATV-1 rendezvous. Set 2 was tested on DO-15; while the readiness signal was not obtained, the Kurs designers deemed the test successful because they have seen this signature before. Set 1 was tested on DO-1, and the nominal readiness signal was obtained at 5:11:42pm.

- ATV is exhibiting slightly (~200-300 W) more power consumption than expected. Data indicate that its electronic boxes are drawing less, but its heaters more than nominal. Among the possible causes under assessments are one or two missing or loose thermal MLI (Multi-Layered Insulation) blankets. When ATV approaches the ISS, a thorough external inspection will precede any docking attempts (which could be impeded by loose insulation).

ASN-M Internal Transition Failure: RSC-Energia has traced the failure of switching over to the ASN-M Satellite Navigation System's NVM-1 Navigation Computer Module (one of two) to the suspected Common Power Switching timer (BSK DB2) of the Onboard Complex Control System (SUBK). Its removal & replacement is scheduled for tonight. ASN-M is critically required for ATV docking.

VolSci Preview: Three optional activities for the Voluntary Science program on days 3/25 & 3/26 were suggested to Peggy & Garrett for their choice. Selection is required by tonight. *[The session choices are: (1) LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System), (2) USND (Ultrasound) relocation & checkout; and (3) SLAMMD (Space Linear Acceleration Mass Measurement) – Body Mass Measurement.]*

Shuttle Update: Currently under consideration is the plan to have Endeavour land one revolution (~92 min) earlier than originally planned on 3/26, to take advantage of the first daylight landing opportunity. This will require a small sleep shift for the Shuttle crew of an additional 15 min earlier on FD14 & FD15 but is only a minimal impact for the ISS crew.

ISS Crew Sleep Shift Planning: To synchronize the ISS crew's timeline with STS-123/1J/A docking and subsequent docked activities, Peggy's, Yuri's and Leo's wake/sleep cycle has undergone a number of shifts which started on 3/11. For the next five days, the wake/sleep shift schedule is as follows (all times EDT):

FD11	Wake: 1:30pm (3/20) – 5:00am (3/21) Sleep: 5:00am – 1:30pm (3/21)
FD12	Wake: 1:30pm (3/21) – 4:00am (3/22) Sleep: 4:00am – 12:30pm (3/22)
FD13	Wake: 12:30pm (3/22) – 4:00am (3/23) Sleep: 4:00am – 12:30pm (3/23)

FD14	Wake: 12:30pm (3/23) – 3:30am (3/24) Sleep: 3:30am – 12:00pm (3/24)
FD15	Wake: 12:00pm (3/24) – 3:30am (3/25) Sleep: 3:30am – 12:00pm (3/25)

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:10am EDT [= epoch]):*
Mean altitude -- 341.1 km
Apogee height -- 342.2 km
Perigee height -- 340.1 km
Period -- 91.36 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0001558
Solar Beta Angle -- 45.5deg (magnitude increasing)
Orbits per 24-hr. day -- 15.76
Mean altitude gain in the last 24 hours -- 359 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53453

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

- 3/20 (FD11) – EVA-4 to demonstrate T-RAD, replace RPCM, get-aheads (~6:28pm)
- 3/22 (FD13) – EVA-5 to assemble OBSS KAU & stow OBSS, install MISSE-6s, inspect SARJ (~5:23pm)
- 3/24 (FD15) – STS-123/Endeavour undocking (~7:55pm)
- 3/26 (FD17) – STS-123/Endeavour deorbit; landing (KSC);

03/14/08 -- ATV1 "Jules Verne" CAM (Collision Avoidance Maneuver) Demo, -5m/s, 4:00am-5:30am EDT;
03/19/08 -- ATV1 "Jules Verne" parking point (loiter) arrival 8:00am EDT ~1200 mi. in front of ISS;
03/27/08 – ATV1 end of loiter; leave parking point - ~2:00am;
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch - ~7:16am (Sergei Volkov, Oleg Kononenko, Yi So-yeon)
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~8:43am

04/19/08 -- Soyuz TMA-11/15S undocking/landing (FGB nadir port)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/19/08
Date:	Wednesday, March 19, 2008 2:30:07 PM
Attachments:	

ISS On-Orbit Status 03/19/08

All ISS systems continue to function nominally, except those noted previously or below. *STS-123-1J/A Flight Day (FD) 9/10. Crew sleep cycle today: Sleep 5:00am–1:30pm; wake 1:30pm–5:00am tomorrow.*

Three more major mission steps were accomplished:

1. SPDM (Special Purpose Dexterous Manipulator) "Dextre", with repositioned arms, was successfully stowed on the U.S. Lab PDGF (Power & Data Grapple Fixture) *(and is looking very cool)*;
2. SLP (Spacelab Pallet) was returned to the Shuttle PLB (Payload Bay) for re-berthing; and
3. SSRMS (Space Station Remote Manipulator System) was "walked off" the Node-2 PDGF onto MT/MBS (Mobile Transporter/Mobile Base System) PDGF-3 and maneuvered into position for today's MT translation from Worksite 6 (WS6) to WS4.

[During commanding of the SPDM's body ("waist") roll joint to stowage mode, it rotated in the opposite direction than expected, due to a sign mistake (polarity inversion, i.e., a plus-sign instead of a minus-sign) in the DMCS (Dexterous Manipulator Control Software) configuration file. Flight Controllers worked around this in real time, and the crew was able to maneuver the SPDM LEE (Latching End Effector) onto the LAB PDGF without further ado. Work is underway at CSA/MDA to write a corrective software patch.]

After yesterday's wakeup at ~2:30pm EDT and before breakfast, CDR Peggy Whitson completed another session with the SLEEP experiment (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop for downlink, as suggested on her discretionary "job jar" task list. *[To monitor the crewmember's sleep/wake patterns and light exposure, Peggy wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log*

entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]

FE-2-16 Garrett Reisman performed his first session with the biomed experiment INTEGRATED IMMUNE (Validating Procedures for Monitoring Crew member Immune Function), collecting wet saliva samples. Later in the day, FE-2 Leo Eyharts readied the equipment for his own saliva collection tonight. *[IMMUNE protocol requires the collection to occur first thing post-sleep, before eating, drinking and brushing teeth, and all samples are stored at ambient temperature. Along with NUTRITION (Nutritional Status Assessment), INTEGRATED IMMUNE samples & analyzes participant's blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected at intervals during the collection day using a specialized book that contains filter paper. The liquid saliva collections require that the crewmember soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations.]*

FE-1 Yuri Malenchenko continued preparations for operating the Russian/German TEKh-20 Plasma Crystal-3 Plus (PK-3+) experiment payload. *[After unstowing and setting up the hardware yesterday in the* Service Module (SM)*, leak checking of the electronics box and evacuation of the vacuum work chamber (ZB) in the SM Work Compartment (RO) with the turbopump, Malenchenko today conducted more hardware testing and calibration, uploaded new software from a USB stick, checked out the software installation and verified the readiness of the experiment. After starting the turbo pump right after wake-up and conducting additional leak checking on the ZB during the "day", the FE-1 deactivated the turbopump this morning at ~4:55am EDT. The resulting log file was then downloaded to laptop for downlink via BSR-TM. The experiment is performed on plasma, i.e., fine particles charged and excited by HF (high frequency) radio power inside the evacuated work chamber. Main objective is to obtain a homogeneous plasma dust cloud at various pressures and particle quantities with or without superimposition of an LF (low frequency) harmonic electrical field. The experiment is conducted in automated mode. PK-3+ has more advanced hardware and software than the previously used Russian PKE-Nefedov payload.]*

Later, Malenchenko performed IFM (In-flight Maintenance) in the SM, removing an amplifier of the STTS audio subsystem behind comm panel 6 and replacing it with a spare unit. A functional test of the R&R afterwards was successful. *[The old amplifier had been scavenged from SM comm panel #2 on 6/26/07.]*

CDR Whitson and MS3 Doi conducted a brief EPO (Educational Payload Operations) demo for the Japanese Aerospace Exploration Agency (JAXA), with Takao being photographed while taking payload samples (plant seeds, eggs, DVD) from a CTB (Cargo Transfer Bag) for demo, then restowing them in the bag.

Working in the JLP (JEM Experiment Logistics Module Pressurized Section), Takao Doi & Rick Linnehan assembled two JTVE (JEM Television Equipment) booms in preparation for Flight 1J (which delivers the JEM "Kibo" Laboratory). The assembled booms were stowed for now in the JLP.

After the crew reported excessive noise from the CCAA (Common Cabin Air Assembly) air conditioner in Node-2, CDR Whitson took air flow and sound level measurements in the "Harmony" module based on various fan speed settings. Engineers are assessing the data. *[On 1/10, the Node-2 CCAA fan was reduced to 4000 rpm as a temporary measure to reduce the noise level, but higher fan speeds are necessary to move the air sufficiently once the crew quarters and exercise equipment are installed in Node-2.]*

In the SM, Leo Eyharts set up the video equipment for filming his subsequent workout on the TVIS (Treadmill with Vibration Isolation & Stabilization) for biomechanical evaluation of his performance and assessment of the hardware status by ground engineers. The camera gear was torn down and stowed afterwards.

Yuri conducted the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various Russian segment (RS) hatchways, including the FGB-to-Soyuz tunnel, and the FGB-to-Node passageway. *[This is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).]*

In the SM, the FE-1 took readings of potentially harmful atmospheric contaminants with the CMS (Countermeasure System) part of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, which uses preprogrammed microchips to measure H_2CO (Formaldehyde, methanal), CO and NH_3 (Ammonia), taking one measurement per microchip;

Air samples were also collected by Peggy with a U.S. GSC (Grab Sample Container) at the center of the Lab, SM and Columbus.

Malenchenko completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of*

replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]

Before sleeptime this morning, Garrett conducted the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Peggy performed the periodic offloading of the Lab CCAA (Common Cabin Air Assembly) dehumidifier’s condensate tank, filling a CWC (Contingency Water Container, #1054) with the collected water slated for processing. No samples were required this time. *[Estimated offload time before reaching the tank’s neutral point (leaving ~6 kg in the tank): ~30 min.]*

Working from the Russian “available time” suggestions list, Yuri Malenchenko performed the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder).

A second task list item for the FE-1 for FD9 was the daily monitoring, picture-taking and downloading for the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Yuri transferred the crew’s exercise data file to the MEC (Medical Equipment Computer) laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

The FE-1 also took the periodic sensor readings of the Russian “Pille-MKS” (MKS = ISS) radiation dosimetry experiment which has ten sensors placed at various locations in the Russian segment (DC1, SM starboard & port cabin windows, ASU toilet facility, control panel, etc.). *[Nine of the ten dosimeters are read manually.]*

The ISS crew began their sleeptime this morning at 5:00am, the Shuttle crew at

5:30am. For both crews, workday began today at 1:30pm EDT (but it's mostly a well-deserved off-duty day).

Tonight at ~7:08pm (8:08am tomorrow in Tokyo), crewmembers CDR Whitson, CDR Gorie and MS3 Doi are scheduled to receive a VIP call from Japan's Prime Minister Yasuo Fukuda, accompanied by Minister of Education, Culture, Sports, Science & Technology Kisaburo Tokai, JAXA Astronaut Chiaki Mukai, and five Junior High students.,

Later, at ~8:58pm, both flight crew will engage in an interactive PAO TV interview with three U.S. media clients,- CBS News (Meg Oliver), NBC News (Tom Costello) and WMUR-TV (Tom Griffith).

At ~3:43am tomorrow morning, Bob Behnken (EV1) and Mike Foreman (EV2) will begin their "campout" in the A/L with hatch closure and depressurization of the CL (Crewlock) from 14.7 to 10.2 psi, followed by mask prebreathe. Sleep time for the ISS crew begins at ~5:00am. *[For the Campout, fresh METOX (Metal Oxide) canisters will be installed in the A/L for CO_2 control. EVA-4 will begin at ~6:28pm and last approximately 6.5 hrs, ending at ~12:58am. Its major objectives are: (1) Replace an RPCM (Remote Power Controller Module); (2) conduct TRAD (Tile Repair Ablator Dispenser) demo in the Shuttle PLB; (3) clean up worksite & ingress.]*

MT Transfer: At 2:12pm-4:12pm, the Mobile Transporter, carrying the MBS and SSRMS, moves from WS6 to WS4 on the main truss on IMCA (Integrated Motor/ Controller Assembly) string A.

Columbus FSL Update: Ground teams have attempted another FSL (Fluid Science Laboratory) troubleshooting by swapping to the redundant Bus (MIL Bus B) and activating the FSL ISPR (International Standard Payload Rack). However, voltage and amperage checks during the RPDA (Remote Power Distribution Assembly) activation were off-nominal. Any further troubleshooting activities are on hold until next week, after the 1J/A joint mission. A new connector for FSL will be flown on Flight 1J (not on Soyuz 16S).

ASN-M Internal Transition Failure: RSC-Energia is troubleshooting a problem with the ASN-M Satellite Navigation System, critically required for ATV docking, which failed a switchover to its NVM-1 Navigation Computer Module (one of two). After first suspecting NVM-1 as failed, specialists now believe the problem is in the Common Power Switching timer (BSK DB2) of the Onboard Complex Control System (SUBK), but this needs to be confirmed ASAP. If so, the BSK will be replaced tomorrow or on Friday (3/21). Energia never had a similar failure in the

ISS and “hopes all functionality can be restored for supporting ATV operations”.

ISS Crew Sleep Shift Planning: To synchronize the ISS crew’s timeline with STS-123/1J/A docking and subsequent docked activities, Peggy’s, Yuri’s and Leo’s wake/sleep cycle is undergoing a number of shifts which started on 3/11. For the next six days, the wake/sleep shift schedule is as follows (all times EDT):

FD10	Wake: 1:30pm (3/19) – 5:00am (3/20) Sleep: 5:00am – 1:30pm (3/20)
FD11	Wake: 1:30pm (3/20) – 5:00am (3/21) Sleep: 5:00am – 1:30pm (3/21)
FD12	Wake: 1:30pm (3/21) – 4:00am (3/22) Sleep: 4:00am – 12:30pm (3/22)
FD13	Wake: 12:30pm (3/22) – 4:00am (3/23) Sleep: 4:00am – 12:30pm (3/23)
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No CEO photo targets uplinked for today.

CEO photography can be studied at this “Gateway” website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:49am EDT [= epoch]):*
Mean altitude -- 340.7 km
Apogee height -- 341.3 km
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Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0000825
Solar Beta Angle -- 42.1deg (magnitude increasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 93 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53437

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

- 3/19 (FD10) – Half-day off duty; EVA-4 preparations
- 3/20 (FD11) – EVA-4 to demonstrate T-RAD, replace RPCM, SPDM to Lab (~6:28pm)
- 3/22 (FD13) – EVA-5 to assemble OBSS KAU & stow OBSS, install MISSE-

6s, inspect SARJ (~5:23pm)

- 3/24 (FD15) – STS-123/Endeavour undocking (~7:55pm)
- 3/26 (FD17) – STS-123/Endeavour deorbit (~7:33pm); landing (KSC) -- ~8:35pm;

03/14/08 -- ATV1 “Jules Verne” CAM (Collision Avoidance Maneuver) Demo, -5m/s, 4:00am-5:30am EDT;
03/19/08 -- ATV1 “Jules Verne” parking point (loiter) arrival 8:00am EDT ~1200 mi. in front of ISS;
03/27/08 – ATV1 end of loiter; leave parking point - ~2:00am;
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
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3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/18/08
Date:	Tuesday, March 18, 2008 3:17:27 PM
Attachments:	

ISS On-Orbit Status 03/18/08

All ISS systems continue to function nominally, except those noted previously or below. *STS-123-1J/A Flight Day (FD) 8/9. Crew sleep cycle today: Sleep 6:00am–2:30pm; wake 2:30pm–5:00am tomorrow.*

EVA-3 was completed successfully by Rick Linnehan and Bob Behnken in 6h 53m, accomplishing most of its objectives.
[During the spacewalk, Linnehan (EV1) & Behnken (EV2) –

1. *Installed the OTP (ORU {On-Orbit Replaceable Unit} Temporary Platform) and THA (Tool Holder Assembly) on the SPDM (Special Purpose Dexterous Manipulator),*
2. *Removed MLI (Multi-Layered Insulation) thermal blankets,*
3. *Installed the CLPA (Camera, Light & Pan/Tilt Assembly) on the SPDM,*
4. *Cleaned up & configured the SLP (Spacelab Pallet) for return [to be transferred with the SSRMS (Space Station Remote Manipulator System) from the POA (Payload ORU Attachment) to the Orbiter PLB (Payload Bay) tomorrow evening (FD9)],*
5. *Transferred the spare SSRMS yaw joint from the PLB to stowage on the ESP-2 (External Stowage Platform 2),*
6. *Transferred two spare DCSUs (Direct Current Switching Units) from the PLB to stowage on the ESP-2,*
7. *Transferred the LWAPA (Light Weight Adapter Plate Assembly) for installation on the Columbus EPF (External Payload Facility) and prepared for the installation of two MISSE-6 (Materials International Space Station Experiment) payloads,*
8. *Removed the MCAS EBCS (Mobil Common Attachment System External Berthing Camera System) cover flap as a get-ahead, and*
9. *Stowed the JLP (JEM Experiment Logistics Module Pressurized Section) trunnion covers on a handrail for future installation.*

Tasks not completed:

- *MISSE-6B was not installed [its pip pins could not be properly aligned &*

locked for final installation on the LWAPA; MISSE-6B was returned to the PLB sidewall carrier],

- *MISSE-6A was not removed from the PLB carrier for installation due to lack of remaining EVA time [the MISSE-6 units will be added to EVA-5, probably replacing TBA-5 (Trundle Bearing Assembly 5) re-installation. EVA-4 will remain unchanged] , and*
- *Some SPDM thermal MLI covers were left in place for later removal [viz., an EP blanket, the OTCM-2 (ORU Tool Changeout Mechanism 2) sock, and the flaps on SPDM joint 2-7].*

Official start time of the spacewalk was 6:51pm EDT, about 32 min ahead of timeline, and it ended at 1:44am. Total EVA duration (PET = Phase Elapsed Time) was 6h 53min. It was the 107th spacewalk for ISS assembly & maintenance and the 79th from the station (57 from Quest, 22 from Pirs, 28 from Shuttle) totaling 486h 23min, the 11th for Expedition 16 (totaling 78h 31min) and the 8th so far this year. After today's EVA, a total of 135 spacewalkers (103 NASA astronauts, 21 Russians, and 11 astronauts representing Japan-1, Canada-4, France-1, Germany-2 and Sweden-3) have logged a total of 674h 45min outside the station on building, outfitting and servicing. It was also the 129th spacewalk involving U.S. astronauts.

After wakeup at ~2:30pm EST yesterday, ending the 8.5-hr sleep period before the spacewalk, the Airlock Crewlock (A/L CL) hatch was cracked at ~3:10pm for a hygiene break/with mask prebreathe for Linnehan and Behnken, after spending the night on 10.2 psi campout. Around 3:30pm, the hatch was closed again by IVs (Intravehicular Crewmembers) for EVA preparations in 10.2 psi, followed by EMU purge & prebreathe. Afterwards, IVs supported the CL depressurization and EV1/ EV2 egress (EMUs switched to batteries at 6:51pm).

As part of pre-EVA activities, FE-1 Malenchenko powered down the ham radio equipment in SM (Service Module) and FGB at ~2:30am EST to prevent RF interference with the EMUs during the spacewalk.

Before her breakfast and EVA-support activities as IV, CDR Peggy Whitson completed another session with the SLEEP experiment (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop for downlink, as suggested on her discretionary "job jar" task list. *[To monitor the crewmember's sleep/wake patterns and light exposure, Peggy wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Yuri Malenchenko made preparations for another run of the Russian/German TEKh-20 Plasma Crystal-3 Plus (PK-3+) experiment payload, the second of Expedition 16, by unstowing the hardware, installing it in the SM for operation and photographing the setup. The images were downlinked to TsUP via BSR-TM for inspection, and the FE-1 performed the initial leak check of the PK-3 Electronics Box before its evacuation. More work to come tomorrow. *[The experiment is performed on plasma, i.e., fine particles charged and excited by HF (high frequency) radio power inside a vacuum work chamber. Main objective is to obtain a homogeneous plasma dust cloud at various pressures and particle quantities with or without superimposition of an LF (low frequency) harmonic electrical field. The experiment is conducted in automated mode. PK-3+ has more advanced hardware and software than the previously used Russian PKE-Nefedov payload.]*

For Garrett Reisman's upcoming first session with the biomed experiment "Integrated Immune", Peggy Whitson set up the equipment needed to support saliva collection. *[Along with NUTRITION (Nutritional Status Assessment), Integrated Immune (Validating Procedures for Monitoring Crew member Immune Function) samples & analyzes participant's blood, urine, and saliva before, during and after flight for changes related to functions like bone metabolism, oxidative damage and immune function to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected at intervals during the collection day using a specialized book that contains filter paper. The liquid saliva collections require that the crewmember soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations. The on-orbit blood samples are collected right before undocking and returned on the Shuttle so that analysis can occur with 48 hours of the sampling. This allows assays that quantify the function of different types of white blood cells and other active components of the immune system. Samples are secured in the MELFI (Minus-Eighty Laboratory Freezer for ISS). Also included are entries in a fluid/medications intact log, and a stress-test questionnaire to be filled out by the subject at begin and end. Urine is collected during a 24-hour period, conventionally divided into two twelve-hour phases: morning-evening and evening-morning.]*

During the spacewalk, which MS2 Foreman supported as IV, Whitson and MS3 Doi continued configuring the JLP today. *[Activities included rotation of the DMS (Data Management System) rack, retrieving two hard dummy panels from the rack standoff, assembling a dummy panel and installing it to the rack standoff. In preparation for Flight 1J, Takao & Peggy retrieved a JEM (Japanese Experiment Module) equipment bag as well as two JTVE (JEM Television Equipment) booms which for their assembly tomorrow (they will then remain in the JLP for their*

eventual deployment during Flight 1J's EVA-2.]

After the spacewalkers' ingress this morning at 1:44am, post-EVA activities by Whitson, Linnehan, Foreman and Behnken in the Airlock (A/L) consisted of recharging the EMU/spacesuits with water from PWR (Payload Water Reservoir), then reconnecting the LTAs (Lower Torso Assemblies) to the EMUs and capping the UIA (Umbilical Interface Assembly), initiating and monitoring the regeneration of the METOX (Metal Oxide) CO_2 filter canisters, initiating the discharge/recharge process on the EMU batteries in the BSA (Battery Stowage Assembly), turning around the DCS-760 EVA camera (including downloading its photographs), and reconfiguring EVA tools.

After the EVA, Eyharts & Reisman maneuvered the SSRMS to re-grapple the SPDM and feed operational power to it for its heaters. The SPDM LEE (Latching End Effector) was then commanded to release the SLP, after which Dextre was maneuvered by SSRMS to an overnight park position.

Tonight at ~5:00pm, Eyharts & Reisman, joined by PLT Gregory Johnson, will command both SPDM arms in stow position and, at ~7:30pm, relocate Dextre for stowage on the U.S. Lab PDGF (Power & Data Grapple Fixture).

After releasing Dextre, Garrett and Greg will move the SSRMS over to grapple the SLP, detach it from the POA and transfer it to the Orbiter for berthing in the PLB. This activity should be completed by ~12:00midnight.

FE-1 Malenchenko hooked up the necessary "plumbing" and compressor for transferring potable water from the BV1 tank of Progress M-63/28P to an EDV storage container. *[The water transfer, monitored by Yuri several times during the "day", at first was by self-flow (under its own tank pressure), then using the compressor pump via a GZhS gas/liquid separator, to remove air bubbles in the water. The BV2 Rodnik tank was emptied of its water by Yuri on 2/14. Filling of the empty Progress BV1 & BV2 tanks with urine will be scheduled later.]*

Yuri conducted the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various Russian segment (RS) hatchways, including the FGB-to-Soyuz tunnel, and the FGB-to-Node passageway. *[This is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).]*

The FE-1 also completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

FE-2 Eyharts performed periodic maintenance on the U.S. OGS (Oxygen Generation System), activating the WDS (Water Delivery System) from a filled PWR (Payload Water Reservoir), then deactivating it, leaving the PWR stowed in front of it. *[Like the Russian Elektron, OGS produces O_2 from water by electrolysis, dumping the also generated H_2 (hydrogen) through venting.]*

Malenchenko spent several hours on transferring discarded equipment and waste to Progress 28P and loading the spacecraft-turned-trash can preparatory to its separation on 4/1 for destructive reentry, tracking transfers in the IMS (Inventory Management System).

Reisman, as Eyharts before him, had 60 minutes for himself for general orientation (station familiarization & acclimatization), as is standard daily rule for the first two weeks after starting station residency.

Later, before sleeptime this morning (6:00am), Yuri conducted the daily IMS maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Working from the Russian “available time” suggestions list, Yuri Malenchenko performed the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder).

A second task list item for the FE-1 for FD7 was the daily monitoring, picture-taking and downloading for the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

Despite their busy timelines, all ISS crewmembers had time scheduled yesterday (as well as tonight after wakeup) for conducting their regular physical exercise.

The ISS crew began their sleeptime this morning at 6:00am, the Shuttle at 6:30am. For both crews, currently asleep, workday begins later today at 2:30pm EDT.

KOB-2 TCS Pump Update: After some more testing by TsUP-Moscow, RSC-Energia has determined that micro pump #1 (one of two) in the 4SPN1 replaceable pump panel of the SM TCS (SOTR, Thermal Control Systems)’s KOB-2 loop is failed. Its replacement will be planned pending launch of spare hardware (not

currently onboard). At present, thermal loop KOB-2 is active with its alternate twin-pump package 4SPN2, with KOB-1 available as redundant backup. *[Each of the two SOTR KOB loops has two redundant pump panels with two redundant pumps each. While in the early years of Mir and ISS the pumps were integral to the SPN panels, the current design allows them to be replaced without requiring an entire new SPN block.]*

ATV Update (Flight Days 7, 8, 9): No phasing or rendezvous burns were performed during FDs 7, 8, & 9. PDE-4 (Propulsion Drive Electronics #4) was successfully re-integrated on 3/15 (FD7) at 6:06am EDT as part of the recovery from the FDIR actions during the MC1-2 burn. The switch to CPF-2 (Communication Processor Formatter #2) was completed successfully on 3/17 (FD9) at 4:30am. The next scheduled burns are TV1_1 and TV1_2 today (3/18) at 6:30:34pm & 7:16:45pm. They will be performed with the OCS (main engines) and in helium (He) pressurant configuration B, which exercises the redundant set of He pressure regulators and is the first time these regulators will be used for an OCS burn. They have been used previously with the ACS (attitude control thrusters) and have performed nominally, as also during the initial post-insertion pressurization.

ISS Crew Sleep Shift Planning: To synchronize the ISS crew's timeline with STS-123/1J/A docking and subsequent docked activities, Peggy's, Yuri's and Leo's wake/sleep cycle is undergoing a number of shifts which started on 3/11. For the next six days, the wake/sleep shift schedule is as follows (all times EDT):

FD9	Wake: 2:30pm (3/18) – 5:00am (3/19) Sleep: 5:00am – 1:30pm (3/19)
FD10	Wake: 1:30pm (3/19) – 5:00am (3/20) Sleep: 5:00am – 1:30pm (3/20)
FD11	Wake: 1:30pm (3/20) – 5:00am (3/21) Sleep: 5:00am – 1:30pm (3/21)
FD12	Wake: 1:30pm (3/21) – 4:00am (3/22) Sleep: 4:00am – 12:30pm (3/22)
FD13	Wake: 12:30pm (3/22) – 4:00am (3/23) Sleep: 4:00am – 12:30pm (3/23)
FD14	Wake: 12:30pm (3/23) – 3:30am (3/24) Sleep: 3:30am – 12:00pm (3/24)

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:45am EDT [= epoch]):*
Mean altitude -- 340.8 km
Apogee height -- 341.6 km
Perigee height -- 340.1 km
Period -- 91.35 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0001138
Solar Beta Angle -- 38.3 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 35 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53422

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

- 3/19 (FD10) – Half-day off duty; EVA-4 preparations
- 3/20 (FD11) – EVA-4 to demonstrate T-RAD, replace RPCM, SPDM to Lab (~6:28pm)
- 3/22 (FD13) – EVA-5 to assemble OBSS KAU & stow OBSS, install MISSE-6s, inspect SARJ (~5:23pm)
- 3/24 (FD15) – STS-123/Endeavour undocking (~7:55pm)
- 3/26 (FD17) – STS-123/Endeavour deorbit (~7:33pm); landing (KSC) -- ~8:35pm;

03/14/08 -- ATV1 “Jules Verne” CAM (Collision Avoidance Maneuver) Demo, -5m/s, 4:00am-5:30am EDT;
03/19/08 -- ATV1 “Jules Verne” parking point (loiter) arrival 8:00am EDT ~1200 mi. in front of ISS;
03/27/08 – ATV1 end of loiter; leave parking point - ~2:00am;
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch - ~7:16am (Sergei Volkov, Oleg Kononenko, Yi So-yeon)
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~8:43am
04/19/08 -- Soyuz TMA-11/15S undocking/landing (FGB nadir port)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)

08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/17/08
Date:	Monday, March 17, 2008 2:06:39 PM
Attachments:	

ISS On-Orbit Status 03/17/08

All ISS systems continue to function nominally, except those noted previously or below. *1J/A Flight Day 7/8 (FD7/8). Underway: Week 22 of Increment 16. Crew sleep cycle today: Sleep 6:00am–2:30pm; wake 2:30pm–6:00am tomorrow.*

After wake-up yesterday at ~3:30pm, CDR Peggy Whitson completed another session with the SLEEP experiment (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop for downlink, as suggested on her discretionary "job jar" task list. *[To monitor the crewmember's sleep/wake patterns and light exposure, Peggy wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

First activity on the FD7 schedules of FE-1-16 Garrett Reisman & MS1 Bob Behnken was to work with CSA (Canadian Space Agency) ground engineers in using the SSRMS (Space Station Remote Manipulator System) to grapple the SPDM PDGF (Special Purpose Dexterous Manipulator/Power & Data Grapple Fixture) and then conduct diagnostics and "Brake Run-in" (BRIT) tests on the newly assembled Dextre robot. *[SPDM LEE (Latching End Effector) and body ("waist") roll joint diagnostics all passed, as did the BRIT joint tests on the arms except for Arm-2's WP (Wrist Pitch) joint which exceeded the expected joint travel after brake application. Subsequent analysis showed that all SPDM arm brakes are actually meeting specifications (i.e., have adequate braking torque), but that the BRIT and diagnostic tests do not provide an accurate indication of proper brake holding torque, conservatively showing a "false fail" result. Based on this analysis, the crew was given the Go to stow the SPDM arms for EVA-3. SPDM performance during the dexterous arm maneuvers was completely nominal. SSRMS will release the SPDM PDGF shortly before EVA-3 tonight, leaving SPDM unpowered for the*

duration of the spacewalk.]

FE-2 Leo Eyharts worked in the JLP (JEM Experiment Logistics Module Pressurized Section) and Node-2 to install HHGRs (Hatch Handle Guide Rings) and decals on their hatches, to help prevent the hatch handles from being stowed in the wrong position. Also installed was the EVA hatch window cover to the Node-2 zenith hatch.

CDR Whitson powered down the MSG (Microgravity Science Glovebox) in the Lab and removed all InSPACE (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) and InSPACE-2 hardware as well as MSG video equipment for stowage. *[Peggy also stowed remaining video tapes, the last coil assembly and all vial assemblies.]*

Afterwards, Whitson disconnected the MLC (MSG Laptop Computer) and configured the MSG for its transfer to the Columbus module. *[The transfer of the rack from Lab to COL is scheduled for 3/23 (FD14, Sunday, ~9:00pm).]*

First task for FE-1 Yuri Malenchenko after wakeup was to set up the hardware for the Russian MBI-21 PNEVMOKARD experiment and to conduct the session, his fourth (which forbids moving or talking during data recording). The experiment is controlled from the RSE-Med A31p laptop, equipped with new software, and uses the TENZOPLUS sphygmomanometer to measure arterial blood pressure. *[PNEVMOKARD (Pneumocard) is an attempt to obtain new scientific information to refine the understanding about the mechanisms used by the cardiorespiratory system and the whole body organism to spaceflight conditions. By recording (on PCMCIA cards) the crewmember's electrocardiogram, impedance cardiogram, low-frequency phonocardiogram (seismocardiogram), pneumotachogram (using nose temperature sensors), and finger photoplethismogram, the experiment supports integrated studies of (1) the cardiovascular system and its adaptation mechanisms in various phases of a long-duration mission, (2) the synchronization of heart activity and breathing factors, as well as the cardiorespiratory system control processes based on the variability rate of physiological parameters, and (3) the interconnection between the cardiorespiratory system during a long-duration mission and the tolerance of orthostatic & physical activities at the beginning of readaptation for predicting possible reactions of the crewmembers organism during the their return to ground.]*

Reisman & Doi worked in the JLP on continuing its activation and preparation for the arrival of the JEM (Japanese Experiment Module) "Kibo" later this year. *[Garrett & Takao rotated the module racks back to their nominal position and reconfigured JLP for the JEMRMS (JEM Robotic Manipulator System), ICS (Inter Orbit Communication System), Saibo, Ryutai and the JRSR (JEM Resupply*

Stowage Rack) racks. Rack translations within the JLP are scheduled during Flight 1J after the JLP is relocated to its final location on the JEM.
*<u>Background:</u> **Saibo** ("living cell") is a Japanese multipurpose experiment/payload rack system on the ISS that transports, stores and supports subrack facilities such as the CB (Clean Bench) and CBEF (Cell Biology Experiment Facility) equipment by providing structural interfaces, power, data, cooling, water and other items needed to operate science experiments in microgravity. **Ryutai** ("fluid") is a Japanese multipurpose experiment/payload rack system to support the FPEF (Fluid Physics Experiment Facility), SCOF (Solution Crystallization Observation Facility), PCRF (Protein Crystallization Research Facility) and the IPU (Image Processing Unit) by providing structural interfaces, power, data, cooling, water and other items needed to operate science experiments in micro-G.]*

The CDR upgraded the EXPRESS Rack 2 IC (Interface Controller) computer with the new software (Release 5), then readied the A31p laptop for ops by running a batch file.

Starting a new round of RS (Russian Segment) ventilation system maintenance, the FE-1 cleaned "Group A" fan grilles in the Service Module (SM).

Malenchenko also completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables plus the weekly collection of the toilet flush counter (SPK-U), water supply (SVO) readings and POTOK parameters for calldown to TsUP/Moscow. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC (Contingency Water Container) from the Lab humidifier. Weekly SOZh reports (on Sundays) to TsUP/Moscow deal with number & dates of water and urine containers, counter readings of water consumption & urine collection, plus data and total operating time of the Russian POTOK-150MK (150 micron) air filter unit of the SOGS air revitalization subsystem.]*

Later, Yuri conducted the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various Russian segment (RS) hatchways, including the FGB-to-Soyuz tunnel, and the FGB-to-Node passageway. *[This is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).]*

After completion of N_2 (nitrogen) transfer from the Shuttle to ISS (~23 lbs), Reisman took down the transfer equipment. *[By IMMT (ISS Mission Management Team)*

decision this morning, no O_2 (oxygen) will be pumped over since the transferable amount (10-14 lbs before reaching the ORCA 2100 psi threshold) is too small to justify using the lifetime-limited ORCA (Oxygen Recharge Compressor Assembly). The operational cycles allowed under Flight Rule for the ORCA's diaphragm pump have already been modified by waiver from 280,000 to 373,000 cycles. A replacement ORCA will be delivered to KSC in December this year.]

Reisman, as Eyharts before him, had 60 minutes for himself for general orientation (station familiarization & acclimatization), as is standard daily rule for the first two weeks after starting station residency.

Working from the Russian "available time" suggestions list, Yuri Malenchenko conducted the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder).

A second task list item for the FE-1 for FD7 was the daily monitoring, picture-taking and downloading for the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

At ~10:15pm EDT last night, both crews participated in a PAO TV event via Ku- & S-band with KMOX-Radio, St. Louis, MO (Jon Grayson), WEWS-TV, Cleveland, OH (Curtis Jackson), and WBZ-TV, Boston, MA (Ken MacLeod). Topics included the Dextre robotic system assembly, upcoming EVA-3 activities, importance of the newly installed Japanese module, Reisman's arrival to and Eyharts' return from the ISS, and the astronauts' hometown connections.

Whitson and Eyharts reconfigured the DCS-760 EVA camera with 28-mm lens, leaving it on station power until the EMU prebreathe period tomorrow morning, and initiated charging of two camera batteries in the A/L BSA (Airlock Battery Stowage Assembly) for at least 3 hrs.

Despite their busy timelines, all ISS crewmembers had time scheduled yesterday (as well as tonight after wakeup) for conducting their regular physical exercise.

Before going into their sleep period this morning, the joint crew had an hour to review timeline and procedures for EVA-3.

For both crews, currently asleep, workday begins later today at 2:30pm EDT. Rick Linnehan (EV1) and Bob Behnken (EV2) are on "Campout" (*nachalo desaturatsiy* =

desaturation start) in the A/L CL (Crewlock), after hatch closure this morning at ~4:45am. The two spacewalkers performed PBA (Portable Breathing Apparatus) mask prebreathe for denitrogenation, while readying their tools & equipment, then depressed the CL from 14.7 to 10.2 psi for their sleep period. *[For the Campout, fresh METOX (Metal Oxide) canisters were installed in the A/L for CO_2 control.]*

EVA-3 Preview: EVA-3 begins at ~7:23pm and lasts approximately 6.5 hrs, ending at ~2:00am. Its major objectives are: (1) Install OTP/THA (ORU Tool Platform/Tool Holder Assembly), (2) clean up SLP, (3) transfer MISSE-6 & LWAPA (Light-Weight Adaptor Plate Assembly) and install on Columbus, (4) transfer one spare SSRMS yaw joint and two DCSUs (Direct Current Switching Units) from Shuttle PLB (Payload Bay) to ESP-2 (External Stowage Platform 2), (5) install two CLPAs (Camera, Light, PTU Assemblies) on SPDM, and (6) clean up worksite & ingress.

KOB-2 TCS Pump Switchover: Yesterday, one of the four micro pumps in the SM TCS (Thermal Control Systems)'s KOB-2 loop switched over to the backup pump in replaceable pump panel 4SPN1. Nominal software response was to deactivate the Russian SKV-2 air conditioner and turn on the 4SPN2 pump panel. SKV-2 was then reactivated by TsUP-Moscow through ground commanding without issues. Engineers suspect that one 4SPN1 pump has failed (both pumps are still well within their expected lifetime of ~6500 hrs, viz.: N1~4864 hrs, N2~3425 hrs). At present, thermal loop KOB-2 is active with its alternate twin-pump package 4SPN2, with KOB-1 available as redundant backup. The failed pump package 4SPN1 will be investigated. There is no spare hardware onboard.

ISS Crew Sleep Shift Planning: To synchronize the ISS crew's timeline with STS-123/1J/A docking and subsequent docked activities, Peggy's, Yuri's and Leo's wake/sleep cycle is undergoing a number of shifts which started on 3/11. For the next six days, the wake/sleep shift schedule is as follows (all times EDT):

FD8	Wake: 2:30pm (3/17) – 6:00am (3/18) Sleep: 6:00am – 2:30pm (3/18)
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Mean altitude gain in the last 24 hours -- 500 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53406

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

- 3/17 (FD8) – EVA-3 to transfer ORUs, cleanup SLP, install MISSE-6, etc. (~7:23pm)
- 3/20 (FD11) – EVA-4 to demonstrate T-RAD, do get-aheads (~6:28pm)
- 3/22 (FD13) – EVA-5 to stow OBSS, TBDs (~5:23pm)
- 3/24 (FD15) – STS-123/Endeavour undocking (~7:55pm)
- 3/26 (FD17) – STS-123/Endeavour deorbit (~7:33pm); landing (KSC) -- ~8:35pm;

03/14/08 -- ATV1 “Jules Verne” CAM (Collision Avoidance Maneuver) Demo, -5m/s, 4:00am-5:30am EDT;
03/19/08 -- ATV1 “Jules Verne” parking point (loiter) arrival 8:00am EDT ~1200 mi. in front of ISS;
03/27/08 – ATV1 end of loiter; leave parking point - ~2:00am;
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch - ~7:16am (Sergei Volkov, Oleg Kononenko, Yi So-yeon)
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~8:43am
04/19/08 -- Soyuz TMA-11/15S undocking/landing (FGB nadir port)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)

05/25/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
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10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
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10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
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11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
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12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/16/08
Date:	Sunday, March 16, 2008 3:21:17 PM
Attachments:	

ISS On-Orbit Status 03/16/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday – 1J/A Flight Day 6/7 (FD6/7). Ahead: Week 22 of Increment 16. Crew sleep cycle today: Sleep 7:00am–3:30pm; wake 3:30pm–6:00am tomorrow.*

More good news!

SPDM Dextre was checked out and is working nominally with both arms.
[The waist-up-only robot from Canada arrived in space in nine separate pieces that are being assembled in the current spacewalks. Each of the two arms has seven joints; in addition, SPDM (Special Purpose Dexterous Manipulator) Dextre can pivot at the "waist". Its grippers (hands) have built-in socket wrenches, cameras & lights. Only one arm is movable at a time, to keep the robot stable and avoid a two-arm collision. Dextre can be attached to MT (Mobile Transporter) to translate along the stations rail tracks, or alternately to the SSRMS (Space Station Remote Manipulator System) to swing to places where the railcart can't go. What a supercool helper!]

EVA-2 was completed successfully by Rick Linnehan and Mike Foreman in 7h 8m, accomplishing all its objectives.
[During the spacewalk, Linnehan (EV1) & Foreman (EV2) –

1. *Removed SPDM Arms #1 & #2 from the SLP FSE (Spacelab Pallet Flight Support Equipment); the arms were then temporarily stowed on an SLP bracket. During removal of the EDFs (Expandable Diameter Fasteners) from both arms, the crew encountered difficulty in releasing the fasteners. A pry bar was required on both arms to finally release the fasteners,- a critically important and fortunate accomplishment;*
2. *Mated both Arm #1 & Arm #2 to Dextre's main body; and*
3. *Removed several of the 19 MLI (Multi-Layered Insulation) thermal covers from Arms #1 & #2; teams are still assessing what thermal covers are left and which covers need to be removed on EVA-3 tomorrow night.*

Official start time of the spacewalk was 7:48pm EDT, about 35 min ahead of timeline, and it ended at 2:56am. Total EVA duration (PET = Phase Elapsed Time) was 7h 8min. It was the 106th spacewalk for ISS assembly & maintenance and the 78th from the station (56 from Quest, 22 from Pirs, 28 from Shuttle) totaling 479h 30min, the 10th for Expedition 16 (totaling 71h 38min) and the 7th so far this year. After today's EVA, a total of 133 spacewalkers (101 NASA astronauts, 21 Russians, and 11 astronauts representing Japan-1, Canada-4, France-1, Germany-2 and Sweden-3) have logged a total of 667h 52min outside the station on building, outfitting and servicing. It was also the 128th spacewalk involving U.S. astronauts.]

After the EVA, SSRMS re-grappled SPDM and power was re-applied. This allowed the SPDM arms and body to be brought to life (i.e., operational status) for the first time. Diagnostic tests were successfully performed overnight on both arms. Dextre's final assembly is scheduled to be completed tomorrow night on EVA-3. On the following day (FD9), SPDM will be grappled by the SSRMS and relocated to the U.S. Lab PDGF (Power & Data Grapple Fixture).

After the spacewalkers' ingress this morning at 2:56am, post-EVA activities by Peggy Whitson, Rick Linnehan, Mike Foreman and Bob Behnken and Leo Eyharts in the Airlock (A/L) consisted of recharging the EMU/spacesuits with water from PWR (Payload Water Reservoir), then reconnecting the LTAs (Lower Torso Assemblies) to the EMUs and capping the UIA (Umbilical Interface Assembly), initiating and monitoring the regeneration of the METOX (Metal Oxide) CO_2 filter canisters, initiating the discharge/recharge process on the EMU batteries in the BSA (Battery Stowage Assembly), and reconfiguring EVA tools. *[A temporary blower failure of the CDRA (Carbon Dioxide Removal System) at 6:35am had no impact on METOX regeneration. CDRA was reactivated at 7:08am and is currently running.]*

During the EVA, CDR Whitson and MS3 Doi worked in the JAXA JLP (JEM Experiment Logistics Module Pressurized Section) to complete its outfitting and preparation for the arrival of the JEM (Japanese Experiment Module) "Kibo" later this year. *[Peggy and Takao rotated the module racks to obtain temperature readings of its shell (required to support an engineering evaluation of the thermal math models in case the JLP trunnion covers are not installed during one of the next EVAs), then released rack launch restraints, removed rack closeouts, installed pivot fittings and K-Bar assemblies and secured knee braces for the JEMRMS (JEM Robotic Manipulator System), ICS (Inter Orbit Communication System), Saibo, Ryutai and the JRSR (JEM Resupply Stowage Rack) racks. Rack translations within the JLP are planned during Flight 1J after the JLP is relocated to its final location on the JEM.*
<u>Background:</u> ***Saibo*** *("living cell") is a Japanese multipurpose experiment/payload*

rack system on the ISS that transports, stores and supports subrack facilities such as the CB (Clean Bench) and CBEF (Cell Biology Experiment Facility) equipment by providing structural interfaces, power, data, cooling, water and other items needed to operate science experiments in microgravity. ***Ryutai*** *("fluid") is a Japanese multipurpose experiment/payload rack system to support the FPEF (Fluid Physics Experiment Facility), SCOF (Solution Crystallization Observation Facility), PCRF (Protein Crystallization Research Facility) and the IPU (Image Processing Unit) by providing structural interfaces, power, data, cooling, water and other items needed to operate science experiments in micro-G.]*

In the Service Module (SM), FE-1 Malenchenko deinstalled the JAXA-3DPC (Japan Aerospace Exploration Agency-3D Photon Crystals) crystal growth experiment and transferred it to the Shuttle for return to Earth. *[The experiment had been running since 1/22 and was turned off by Yuri on 1/31. Its purpose was to grow photonic crystals in microgravity using particles in electrolytic solutions that will be fixed using ultraviolet light in a process referred to as photocuring, after self-organization and ordering of colloid nanoparticles in an electrolyte solution with subsequent fixation in an elastic gel matrix.]*

Malenchenko also unstowed a spare BRPK air/liquid condensate separator unit, flushed it out with clean water (to remove any sediments that may have accumulated as a result of length storage) and installed it in the BRPK-1 line of the SRV-K2M Condensate Water Recovery System.

As the spacewalk went on, Eyharts set up and conducted the periodic (monthly) O-OHA (On-Orbit Hearing Assessment) test, a 30-min NASA EHS (Environmental Health Systems) examination to assess the efficacy of acoustic countermeasures, using a special MEC (Medical Equipment Computer) laptop application. It was Leo's second onboard O-OHA session. *[The O-OHA audiography test involves minimum audibility measurements for each ear over a wide range of frequencies (0.25-10 kHz) and sound pressure levels, with the crewmembers using individual-specific Prophonics earphones, Bose ANC headsets and the SLM (sound level meter). To conduct the testing, the experimenter is supported by special EarQ software on the MEC, featuring an up/down-arrow-operated slider for each test frequency that the crewmember moves to the lowest sound pressure level at which the tone can still be heard. The baseline test is required not later than about Flight Day 14 for each new Expedition and is then generally performed once per month. Note: There have been temporary hearing deficits documented on some U.S. and Russian crewmembers, all of which recovered to pre-mission levels.]*

Later, Eyharts also installed 22 newly arrived white U.S. RAM (Radiation Area Monitor) dosimeters in the ISS, documenting their deployment photographically, and collected 18 used blue RAMs deployed on 8/13/07, for return on 1J/A.

Before sleeptime, Yuri successfully repaired the broken Multimeter instrument. *[The activities began with FE-1 setting up the MWA (Maintenance Work Area), followed by the soldering of new battery terminal wires to the Multimeter.]*

For both crews, currently asleep, workday begins today at 3:30pm EDT.

After crew wakeup, Leo will remove the deactivated InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) hardware from the MSG (Microgravity Science Glovebox) for stowage.

Before breakfast, as suggested on her discretionary "job jar" task list, Peggy Whitson will complete another "overnight" run with the SLEEP experiment (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop for downlink. *[To monitor the crewmember's sleep/wake patterns and light exposure, Peggy put on a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

First thing for Yuri after wakeup will be to set up the hardware for the Russian MBI-21 PNEVMOKARD experiment and conduct the session, his fourth (which forbids moving or talking during data recording). The experiment is controlled from the RSE-Med A31p laptop, equipped with new software, and uses the TENZOPLUS sphygmomanometer to measure arterial blood pressure. *[PNEVMOKARD (Pneumocard) is an attempt to obtain new scientific information to refine the understanding about the mechanisms used by the cardiorespiratory system and the whole body organism to spaceflight conditions. By recording (on PCMCIA cards) the crewmember's electrocardiogram, impedance cardiogram, low-frequency phonocardiogram (seismocardiogram), pneumotachogram (using nose temperature sensors), and finger photoplethismogram, the experiment supports integrated studies of (1) the cardiovascular system and its adaptation mechanisms in various phases of a long-duration mission, (2) the synchronization of heart activity and breathing factors, as well as the cardiorespiratory system control processes based on the variability rate of physiological parameters, and (3) the interconnection between the cardiorespiratory system during a long-duration mission and the tolerance of orthostatic & physical activities at the beginning of readaptation for predicting possible reactions of the crewmembers organism during the their return to ground.]*

Starting a new round of RS ventilation system maintenance, the FE-1 will work in

the SM, cleaning “Group A” fan grilles.

Afterwards, Yuri will also conduct the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various Russian segment (RS) hatchways, including the FGB-to-Soyuz tunnel, and the FGB-to-Node passageway. *[This is especially important when the ventilation/circulation system has to cope with a larger crew on board, currently ten persons, and one of the two Russian SKV air conditioners off (SKV-1).]*

Also later today, Behnken and Reisman will conduct a brake run-in test on the newly installed SPDM arms and then stow the arms in pre-EVA-3 configuration. *[There are no temperature concerns with SPDM powered off.]*

At ~4:45am tomorrow morning, Rick Linnehan (EV1) and Bob Behnken (EV2) will begin their “campout” in the A/L with hatch closure and depressurization of the CL (Crewlock) from 14.7 to 10.2 psi, followed by mask prebreathe. Sleep time for the ISS crew begins at 6:00am. *[For the Campout, fresh METOX (Metal Oxide) canisters will be installed in the A/L for CO_2 control. EVA-3 will begin at ~7:25am and last approximately 6.5 hrs, ending at ~2:00am. Its major objectives are: (1) Install OTP/THA (ORU Tool Platform/Tool Holder Assembly), (2) clean up SLP, (3) transfer MISSE-6 & LWAPA (Light-Weight Adaptor Plate Assembly) and install on Columbus, (4) transfer one spare SSRMS yaw joint and two DCSUs ((Direct Current Switching Units) from Shuttle PLB (Payload Bay) to ESP-2 (External Stowage Platform 2), (5) install two CLPAs (Camera, Light, PTU Assemblies) on SPDM, and (6) clean up worksite & ingress.]*

Despite their busy timelines, all ISS crewmembers had time scheduled yesterday (as well as tonight after wakeup) for conducting their regular physical exercise.

Transfers: Middeck transfers are going well; no concerns. N_2 (nitrogen) transfer is complete (~23 lbs transferred).

ATV “Jules Verne” Status Update: On 3/14 (Friday), ATV1 performed two maneuvers. Immediately prior to the start of the second burn, PDE-4 (Propulsion Drive Electronics #4) was disabled by an FDIR (Fault Detection, Isolation & Recovery) signal reacting to a temperature threshold violation in a temperature sensor (thermistor T406). Alarms were also observed during the first burn which did not reach the FDIR threshold. Between maneuvers, ATVCC/Toulouse attempted unsuccessfully to reset the alarm counter; thus, the FDIR was triggered at the start of the second burn, disabling PDE-4. The maneuver was completed nominally on three PDEs. To date, all three incidents involving PDE disabling have been associated with other equipment FDIRs (a helium regulator and two

thermistors). All three incidents have been resolved with no loss of vehicle functionality or redundancy. All ATV1 systems are performing nominally. The next burn is planned for 3/18 (Tuesday) at 6:41pm EDT. ATV1 enters parking position on 3/19 at 9:00am.

ISS Crew Sleep Shift Planning: To synchronize the ISS crew's timeline with STS-123/1J/A docking and subsequent docked activities, Peggy's, Yuri's and Leo's wake/sleep cycle is undergoing a number of shifts which started on 3/11. For the next six days, the wake/sleep shift schedule is as follows (all times EDT):

FD7	Wake: 3:30pm (3/16) – 6:00am (3/17) Sleep: 6:00am – 2:30pm (3/17)
FD8	Wake: 3:30pm (3/17) – 6:00am (3/18) Sleep: 6:00am – 2:30pm (3/18)
FD9	Wake: 2:30pm (3/18) – 5:00am (3/19) Sleep: 5:00am – 1:30pm (3/19)
FD10	Wake: 1:30pm (3/19) – 5:00am (3/20) Sleep: 5:00am – 1:30pm (3/20)
FD11	Wake: 1:30pm (3/20) – 5:00am (3/21) Sleep: 5:00am – 1:30pm (3/21)
FD12	Wake: 1:30pm (3/21) – 4:00am (3/22) Sleep: 4:00am – 12:30pm (3/22)

Weekly Science Update (Expedition Sixteen -- Week 21)

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Radiation measurements continue to be performed in the PIRS module. Radiation measurements continue to be performed in the PIRS module. Next memory card exchange took place at 3/14.

ANITA: Completed.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): In progress.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Data collected during the first in-flight session have been down-linked and are under analysis. Engineering assessment provided good results: the system was calibrated within the expected 1 mm accuracy. Scientific analysis is going on. Data collected during second in-flight session are still to be downlinked. The scientific protocols were fully executed in both sessions

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): In progress.

EuTEF (European Technology Exposure Facility): DEBIE-2 showed regular link errors and was switched off on 3/9. DOSTEL: On-going science acquisition. EuTEMP: Currently inactive as planned. EVC: first EVC pictures were received on 3/6. Further commissioning was performed on 3/14 with a first successful picture acquisition run. During a second sequence with different parameters, however, again no HRD (high rate data) could be received. Under further investigation. EXPOSE: On-going science acquisition. FIPEX: Sensor units RAM3, RAM4 and ZENITH8 were switched on. However, FIPEX showed link errors and was switched off again. MEDET: Successful MEDET commanding from User Home Base on 3/10. On-going science acquisition. PLEGPAY: Further commissioning to be planned. TRIBOLAB: In Stand-by mode.

Fluid Science Laboratory (FSL): The FSL Facility commissioning is on hold pending restoration of a LAN (Local Area Network) cable connection.

GEOFLOW: Troubleshooting on FSL LAN cable repair was successfully performed. However, damage on the MIL-STANDARD bus connector was observed (two pins are missing). Start of GEOFLOW is pending further FSL troubleshooting. FSL FCE (Facility Core Element) locking was performed for 1J/A docking.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): In progress.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal

Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Complete.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION/REPOSITORY: “Leo, thanks for your attention to detail in completing the FD30 Nutr/Rep session! The barcode information conveyed via crew notes was very helpful.”

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): “Peggy, thanks for completing your Actiwatch download. We have downlinked your data and sent it to the PI. We have placed on your task list your last scheduled sleep logging session for next week. Thanks for the extra sleep logging.”

SOLAR (Solar Monitoring Observatory): Anomaly on platform pointing mode under further investigation. No science acquisition possible so far.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): Thank you, Peggy, for completing the additional SWAB session off the Voluntary Science list. The extra data collected will assist the PI in a comparison between the previous

samples in the USL and those you recently collected from the new modules that they would not have originally been able to obtain. “

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: In progress.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): Further attempts made to reduce condensation in ECs (Experiment Containers) by continuous flushing and by flushing only 2 EC’s at a time (to increase the flow / pressure) did not reduce the condensation significantly. The condensation presented a major challenge on high-resolution picture quality for the crew activity on 3/10. To recover, an additional video session was proposed during the fixation because the fixation fluid clears the EC windows. During the ground commanding after the photo activity, two BIOLAB (BLB) anomalies occurred which lead to a loss of centrifugation and temperature control for ~4:20 versus the 2 hours that was originally foreseen. Fixation & washing was planned during the night from 3/11 to 3/12. Multiple BLB anomalies occurred on both rotors. Troubleshooting did not allow to perform any fixation on 3/12 or 3/13. Rotor B was blocked and could not provide a 1-g stimulus since 3/11. The 4 EC’s from Rotor A (0-g condition) were transferred to BLB TCU at +4degC to slow down the growth and will be downloaded on 1J/A. 4 EC’s of Rotor B have yet to be retrieved by the crew from the blocked Rotor B. Anomalies during WAICO-Run#1 imply major impact on science return.

CEO (Crew Earth Observation): Ongoing.

No CEO photo targets uplinked for today.

CEO photography can be studied at this “Gateway” website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:17am EDT [= epoch]):*
Mean altitude -- 340.4 km
Apogee height -- 341.1 km
Perigee height -- 339.6 km
Period -- 91.34 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0001149
Solar Beta Angle -- 29.9 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 124 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53390

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

- 3/17 (FD8) – EVA-3 to transfer ORUs, cleanup SLP, install MISSE-6, etc. (~7:23pm)
- 3/20 (FD11) – EVA-4 to demonstrate T-RAD, do get-aheads (~6:28pm)
- 3/22 (FD13) – EVA-5 to stow OBSS, TBDs (~5:23pm)
- 3/24 (FD15) – STS-123/Endeavour undocking (~7:55pm)
- 3/26 (FD17) – STS-123/Endeavour deorbit (~7:33pm); landing (KSC) -- ~8:35pm;

03/14/08 -- ATV1 “Jules Verne” CAM (Collision Avoidance Maneuver) Demo, -5m/s, 4:00am-5:30am EDT;
03/19/08 -- ATV1 “Jules Verne” parking point (loiter) arrival 8:00am EDT ~1200 mi. in front of ISS;
03/27/08 – ATV1 end of loiter; leave parking point - ~2:00am;
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
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10/01/08 -- **NASA 50 Years**
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12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/15/08
Date:	Saturday, March 15, 2008 3:12:15 PM
Attachments:	

ISS On-Orbit Status 03/15/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – 1J/A Flight Day 5 (FD5). Crew sleep cycle today: Sleep 7:00am–3:30pm; wake 3:30pm–7:00am tomorrow.*

Node-2/JLP vestibule outfitting, JLP ingress & JLP rack reconfigurations successfully accomplished! The first Japan-made human-rated space facility is now in operation. ***Arigato Gozaimasu!***
[After completing outfitting the Node-2 vestibule to the JAXA JLP (JEM Experiment Logistics Module Pressurized Section), including removing CBM (Common Berthing Mechanism) hardware, installing several utility jumpers & taking air samples, crewmembers, led by "high-productivity" Peggy Whitson, ingressed the module three hours early (~9:20pm EDT). This allowed the reconfiguring of three JLP racks (including relocating rack front stowage to Node-2 in preparation for the racks transfer to the JEM during Flight 1J, plus retrieving two bags from behind a rack that contain K-Bars and pivot fittings) to be completed right away, rather than tonight (FD6) as planned. FD6 timeline replanning includes troubleshooting/repair of the broken ISS Multimeter.]

Also, **power was successfully applied to the SPDM** PSU (Special Purpose Dexterous Manipulator/Power Switching Unit) at 10:10pm after the SSRMS (Space Station Remote Manipulator System) was connected, as planned, to Dextre's PDGF (Power & Data Grapple Fixture). *[The SSRMS will remain grappled for power except when needed to support EVAs. EVA-2 will be executed tonight per the nominal plan except the OTCM-2 (ORU Tool Changeout Mechanism 2) thermal "sock" (cover) will not be removed until later.]*

Before sleeptime this morning, FE-2 Eyharts worked in Node-2 to install an Orbiter IWIS RSU (Internal Wireless Instrumentation System/Remote Sensor Unit) that will be connected to the IWIS accelerometer on the Shuttle to measure structural dynamics.

Afterwards, Leo re-equipped the CSI-02 (CGBA Science Insert #2) component of the CGBA-5 (Commercial Generic Bioprocessing Apparatus #5) incubator payload with a Petri dish, inserting it with new material in the CGBA along with a support plate and other parts. Two used Petri dishes were trashed. *[The CGBA incubator is controlled from the ground, with automatic video downlinked to Earth.]*

FE-1 Malenchenko took situational photography of a bonding strip on the VPrK ventilator on the ATV (Automated Transfer Vehicle) airduct, to support the ground in coming up with a backup option.

Also before sleeptime, -

- Yuri performed the periodic (generally monthly) service of the ESA/RSC-Energia experiment ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS), removing its PCMCIA memory card from the AST spectrometer and replacing it with a new card; completed the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM); conducted the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur); and stowed trash & discarded equipment on Progress 28P, to be jettisoned on 4/7;
- In the JLP, Peggy successfully checked out the NPRV (Negative Pressure Relief Valve) and ELPS (Emergency Lighting & Power Supply), then monitored N_2 (nitrogen transfer from the Shuttle to ISS, to be terminated tonight by the Shuttle crew (expected total ~20lbs), and
- Eyharts spent about an hour on handover activities with Reisman, who assumes Leo's FE-2 position after Shuttle departure.

A D-shaped handle with a small MMOD (Micrometeoroid/Orbital Debris)-caused hole, brought onboard from EVA-1, was deburred and taped for protection, to be used on upcoming EVAs for carrying gear.

After a final review of EVA-2 procedures for tonight, the crew turned in at ~7:00am this morning for a good "night's" sleep.

For both crews, currently asleep, workday begins later today at 3:30pm EDT. After hatch closure this morning at ~6:40am, EV1 Rick Linnehan and EV2 Mike Foreman are on "Campout" (*nachalo desaturatsiy* = desaturation start) in the A/L CL (Crewlock). The two spacewalkers performed PBA (Portable Breathing Apparatus) mask prebreathe for denitrogenation, while readying their tools & equipment, then

depressed the CL from 14.7 to 10.2 psi for their sleep period. *[For the Campout, fresh METOX (Metal Oxide) canisters are installed in the A/L for CO_2 control.]*

After wakeup at 3:30pm, ending the 8.5-hr sleep period on 10.2 psi before the spacewalk, the CL hatch will be cracked (i.e., temporarily repressurized) at ~4:10pm for a hygiene break/with mask prebreathe for Foreman and Linnehan. Around 5:20pm, the hatch will be closed again for EVA preps in 10.2 psi, followed by EMU purge & prebreathe. Afterwards, Peggy and Bob Behnken will support CL depressurization, and EV1 & EV2 will egress around 8:23pm. *[EVA-2 will last approximately 7.0 hrs, ending at ~3:28am (ISS crew sleep begins at 7:00am). Its major objectives are: (1) stow SPDM Arm 1 & 2 ; (2) install SPDM, (3) remove thermal covers including the "get-aheads" from EVA-1; (4) clean up the SLP (Spacelab Pallet) for its return to the PLB (Payload Bay), (5) clean up worksite & ingress.]*

Before breakfast, as suggested on her discretionary "job jar" task list, Peggy Whitson will complete another "overnight" run with the SLEEP experiment (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop for downlink. *[To monitor the crewmember's sleep/wake patterns and light exposure, Peggy wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

A second new "job jar" item for Peggy is to fill out the regular FFQ (Food Frequency Questionnaire) on the MEC (Medical Equipment Computer). *[By means of these FFQs, U.S. astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins.]*

Before crew egress at ~8:23pm, FE-2-16 Garrett Reisman will set up the SSRMS for the spacewalk, releasing the SPDM and maneuvering the robotarm to the APFR (Articulated Portable Foot Restraint) install position. During EVA-2, Garrett will support Rick and Mike with the SSRMS and afterwards regrapple the SPDM to continue providing power to its SPU.

ISS Crew Sleep Shift Planning: To synchronize the ISS crew's timeline with STS-123/1J/A docking and subsequent docked activities, Peggy's, Yuri's and Leo's wake/

sleep cycle is undergoing a number of shifts which started on 3/11. For the next six days, the wake/sleep shift schedule is as follows (all times EDT):

FD6	Wake: 3:30pm (3/15) – 7:00am (3/16) Sleep: 7:00am – 3:30pm (3/16)
FD7	Wake: 3:30pm (3/16) – 6:00am (3/17) Sleep: 6:00am – 2:30pm (3/17)
FD8	Wake: 3:30pm (3/17) – 6:00am (3/18) Sleep: 6:00am – 2:30pm (3/18)
FD9	Wake: 2:30pm (3/18) – 5:00am (3/19) Sleep: 5:00am – 1:30pm (3/19)
FD10	Wake: 1:30pm (3/19) – 5:00am (3/20) Sleep: 5:00am – 1:30pm (3/20)
FD11	Wake: 1:30pm (3/20)– 5:00am (3/21) Sleep: 5:00am – 1:30pm (3/21)

ISS Orbit *(as of this morning, 8:13am EDT [= epoch]):*
Mean altitude -- 340.5 km
Apogee height -- 341.3 km
Perigee height -- 339.7 km
Period -- 91.34 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0001173
Solar Beta Angle -- 25.4 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 92 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53374

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

- 3/15 (FD6) – EVA-2 to continue SPDM assembly (~8:23pm)
- 3/17 (FD8) – EVA-3 to transfer ORUs, cleanup SLP, install MISSE-6, etc. (~7:23pm)
- 3/20 (FD11) – EVA-4 to demonstrate T-RAD, do get-aheads (~6:28pm)
- 3/22 (FD13) – EVA-5 to stow OBSS, TBDs (~5:23pm)
- 3/24 (FD15) – STS-123/Endeavour undocking (~7:55pm)
- 3/26 (FD17) – STS-123/Endeavour deorbit (~7:33pm); landing (KSC) -- ~8:35pm;

03/14/08 -- ATV1 “Jules Verne” CAM (Collision Avoidance Maneuver) Demo, -5m/s, 4:00am-5:30am EDT;
03/19/08 -- ATV1 “Jules Verne” parking point (loiter) arrival 8:00am EDT ~1200 mi. in front of ISS;
03/27/08 – ATV1 end of loiter; leave parking point - ~2:00am;
03/29/08 -- ATV1 Demo Day 1

03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch - ~7:16am
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~8:43am
04/19/08 -- Soyuz TMA-11/15S undocking/landing (FGB nadir port)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at

http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/14/08
Date:	Friday, March 14, 2008 2:48:53 PM
Attachments:	

ISS On-Orbit Status 03/14/08

All ISS systems continue to function nominally, except those noted previously or below. *STS-123/1J/A Flight Day 4 (FD4). Crew sleep cycle today: sleep 8:00am–4:30pm; wake 4:30pm–7:00am tomorrow.*

Mission 1J./A's EVA-1 was completed successfully by Rick Linnehan & Garrett Reisman in 7h 1m, accomplishing all its objectives (no get-aheads).
[During the spacewalk, Linnehan (EV1) & Reisman (EV2) –

1. *Prepared the JAXA JLP (JEM Experiment Logistics Module Pressurized Section) for its transfer, i.e. –*
    a. *opened and secured the protective flap over the Node-2 topside (zenith) hatch viewport for the internal CBCS (Centerline Berthing Camera System),*
    b. *removed 8 PCBM (Passive Common Berthing Mechanism) contamination protection covers,*
    c. *demated & stowed JLP LTA (Launch-to-Activation) connectors & installed protective caps on the LTA receptacles;*
2. *Performed Part 1 Assembly of the SPDM (Special Purpose Dexterous Manipulator), i.e. –*
    a. *released two OTCMs (ORU Tool Changeout Mechanisms) from the launch locations on the SLP (Spacelab Pallet),*
    b. *installed the OTCMs on the SPDM,*
    c. *released the OTP EDFs (ORU Temporary Platform Expandable Diameter Fasteners),*
    d. *inspected the SLP PDGF (Power & Data Grapple Fixture) horseshoe connectors;*
3. *Took photographs of the SPDM, and*
4. *Installed a protective wire tie over the sharp edge divot discovered during Flight 1A on the Airlock (A/L) handrail.*

Official start time of the spacewalk was 9:18pm EDT, about 5 min ahead of timeline, and it ended at 4:19am. Total EVA duration (PET = Phase Elapsed Time) was 7h

1min. It was the 105th spacewalk for ISS assembly & maintenance and the 77th from the station (55 from Quest, 22 from Pirs, 28 from Shuttle) totaling 472h 22min, and the 9th for Expedition 16 (totaling 64h 30min) and the 6th so far this year. After today's EVA, a total of 131 spacewalkers (99 NASA astronauts, 21 Russians, and 11 astronauts representing Japan-1, Canada-4, France-1, Germany-2 and Sweden-3) have logged a total of 660h 44min outside the station on building, outfitting and servicing. It was also the 127th spacewalk involving U.S. astronauts.]

In addition, **Japan's JLP module was successfully installed on the Node-2 "Harmony" zenith dock at ~3:00am.** *[Dom Gorie & Takao Doi, supported by Bob Behnken & Leo Eyharts, maneuvered the SSRMS (Space Station Remote Manipulator System) to grapple the JLP in the cargo bay, unberth it and transfer it to the Node-2 topside CBM. All motorized bolts were properly engaged to firmly hold the experiment container at its place, and the standard leak check on the vestibule between it and the Node-2 port was started, to be concluded tonight after crew wake-up. JLP ingress is scheduled afterwards, at around 12:30am EDT.]*

SPDM Power Glitch: The overnight Robotics troubleshooting with a quickly developed and uplinked software patch was unsuccessful and has not restored power to the SPDM in the SLP for activating "Keep-Alive" heaters (however, thermal blankets were left in place during EVA-1 to provide adequate protection). With the RWS (Robotics Workstation) software thus exonerated, a closer review of SLP drawings revealed a design error as most likely cause: in configuring the 1553-bus harness architecture on the SLP, MIL-1553 Standards were not followed, resulting in two bi-directional receivers (amplifiers) directly connected to each other without proper bus termination, causing comm "reflection" between the POA (Payload ORU Attachment) and the SLP PDGF (Power & Data Grapple Fixture) on the 1553 bus. The decision was made to try providing Dextre with power via the SSRMS by connecting it to the SPDM PDGF as soon as possible. The originally scheduled SSRMS-grappling of the OBSS (Orbiter Boom Sensor System) in the PLB (Payload Bay) and its subsequent handoff to the SRMS (Shuttle Remote Manipulator System) for "parking" will still be performed tonight (since SRMS is already in the grapple position), but immediately following, the PDGF will be grappled with the SSRMS to provide power. If this works as expected, the sequence of SSRMS maneuvers on later days will also be modified to ensure that the Canadarm-2 remains connected to the SPDM except during EVA-2 and EVA-3, until Dextre is free of the dysfunctional SLP (which apparently underwent Integration Testing at KSC that was flawed).

After wakeup at ~4:30pm EDT last night, ending the 8.5-hr sleep period on 10.2 psi before the spacewalk, the Airlock Crewlock (A/L CL) hatch was cracked (i.e., temporarily repressurized) at ~5:10pm for a hygiene break/with mask prebreathe

for Garrett and Rich, the hatch was closed again at ~5:55pm for EVA preps in 10.2 psi, followed by EMU purge & prebreathe. Afterwards, IVs supported the CL depressurization and EV1/EV2 egress (EMUs switched to batteries at 9:18pm).

After the spacewalkers' ingress at 4:19am, post-EVA activities by CDR Whitson and FE-2 Eyharts in the A/L consisted of recharging the EMU/spacesuits with water from PWR (Payload Water Reservoir), then reconnecting the LTAs (Lower Torso Assemblies) to the EMUs and capping the UIA (Umbilical Interface Assembly), initiating and monitoring the regeneration of the METOX (Metal Oxide) CO_2 filter canisters, initiating the discharge/recharge process on the EMU batteries in the BSA (Battery Stowage Assembly), and reconfiguring EVA tools.

A new item added to the "job jar" list for Peggy was to perform the regular update of the three "Warning" procedures books with about a dozen new pages reflecting the newly changed station makeup.

Tasks on Yuri Malenchenko's "available time" suggestions list for last night were the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder), and the daily monitoring, picture-taking and downloading for the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

Leo Eyharts also worked in Node-2 to disassemble and remove the CBCS.

For both crews, currently asleep, workday begins later today at 4:30pm EDT. After their 8.5-hr. sleep period, the ISS crew will support the transfer of the OBSS with the SSRMS from the Shuttle PLB for handoff to the SRMS, then grapple the SPDM PDGF with the SSRMS and make preparations for tomorrow night's EVA-2.

Before breakfast, as suggested on her discretionary "job jar" task list, Peggy Whitson will complete another "overnight" run with the SLEEP experiment (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop for downlink. *[To monitor the crewmember's sleep/wake patterns and light exposure, Peggy put on a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Other crew activities after 4:30pm and during the night until 7:00am are to include such items as –

- Peggy Whitson concluding the leak check of the JLP/Node-2 vestibule, turning off the MKAM (Minimum Keep-Alive Monitor) fan after check status and shell temperature and some initial outfitting to provide Node-2 power, then following up with completion of outfitting;
- FE-1 Malenchenko taking air samples at JLP hatch opening using the Russian AK-1M and IPD-CO samplers, joined by other crewmembers collecting samples with the CSA-CP (Compound Specific Analyzer-Combustion Products), CDMK (Carbon Dioxide Monitoring Kit) and GSC (Grab Sample Container) instruments,
- Ingress in JLP by Takao. Peggy, Yuri and Rick (with crewmembers being advised to don PPE (Personal Protective Equipment) surgical masks and goggles until 30 min have elapsed after JPL ingress and later stow the masks for LiOH changeout),
- The periodic (generally monthly) service of the ESA/RSC-Energia experiment ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS) by Malenchenko, removing its PCMCIA memory card from the AST spectrometer and replacing it with a new card,
- A checkout of the JLP's NPRV (Negative Pressure Relief Valve) and ELPS (Emergency Lighting & Power Supply) by Whitson,
- Yuri stowing trash and discarded equipment on Progress 28P, to be jettisoned on 4/7,
- Eyharts and Reisman spending about an hour on handover activities with Reisman, who will assume Leo's FE-2 position after Shuttle departure, and
- Peggy monitoring N_2 (nitrogen transfer from the Shuttle to ISS, already in progress since this morning (expected total ~20lbs).

In addition, the FE-1 will continue the extended leak checking of the spare BZh Liquid Unit (#056) for the Elektron O_2 generator by checking the unit's pressure and charging it once again with pressurized N_2 from the BPA-M Nitrogen Purge Unit (#23) to 1 atm (1 kg/cm^2). The last test pressurization was on 3/11. *[During Elektron operation, the inert gas locked up in the BZh has the purpose to prevent dangerous O_2/H_2 mixing. A leaking BZh cannot be used.]*

ATV "Jules Verne" Update (Flight Day 5): All ATV systems continue to perform nominally. Early this morning, the ATV successfully performed the CAM (Collision Avoidance Maneuver) Demonstration. The maneuver began at 3:57:35am EDT. Based on the ATV GPS (Global Positioning System) satellite data, ballistics specialists estimate that the CAM delta-V was approximately 5.3 m/s, which

includes the effects of the first MSU (Monitoring & Safing Unit) attitude maneuver to sun pointing. The total delta-V for the operation, including the CAM and the post-CAM attitude maneuvers, is estimated at 7.1 m/s, which is within the expected range. The FTC (Fault Tolerant Computer) reset to exit Survival mode occurred at 5:35am. MSU1 was switched off at 6:53am, and MSU2 was switched off at 7:01am. At 7:23am, ATV-CC reported that the vehicle was restored to the nominal configuration. *[The MSU computer is based on dual redundant lane processor architecture using special software for highly critical functions. Among else, it detects a Red Button CAM request by the ISS crew or ATV-CC/Toulouse; it also can automatically determine the necessity of a CAM upon detecting an abnormal ATV kinetic state or system failure, and executes the CAM, ensuring ISS safety. It then controls the ATV for up to 24 hours, thus assuming a major role in the ATV Survival mode.]*

ISS Crew Sleep Shift Planning: To synchronize the ISS crew's timeline with STS-123/1J/A docking and subsequent docked activities, Peggy's, Yuri's and Leo's wake/sleep cycle is undergoing a number of shifts which started on 3/11. For the next six days, the wake/sleep shift schedule is as follows (all times EDT):

FD5	Wake: 4:30pm (3/14) – 7:00am (3/15) Sleep: 7:00am – 3:30pm (3/15)
FD6	Wake: 3:30pm (3/15) – 7:00am (3/16) Sleep: 7:00am – 3:30pm (3/16)
FD7	Wake: 3:30pm (3/16) – 6:00am (3/17) Sleep: 6:00am – 2:30pm (3/17)
FD8	Wake: 3:30pm (3/17) – 6:00am (3/18) Sleep: 6:00am – 2:30pm (3/18)
FD9	Wake: 2:30pm (3/18) – 5:00am (3/19) Sleep: 5:00am – 1:30pm (3/19)
FD10	Wake: 1:30pm (3/19) – 5:00am (3/20) Sleep: 5:00am – 1:30pm (3/20)

ISS Orbit *(as of this morning, 7:34am EDT [= epoch]):*
Mean altitude -- 340.6 km
Apogee height -- 341.3 km
Perigee height -- 339.8 km
Period -- 91.35 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.00011
Solar Beta Angle -- 20.7 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 80 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53358

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

- 3/15 (FD6) – EVA-2 to continue SPDM assembly if power restored (~8:23pm)
- 3/17 (FD8) – EVA-3 to transfer ORUs, cleanup SLP, install MISSE-6, etc. (~7:23pm)
- 3/20 (FD11) – EVA-4 to demonstrate T-RAD, do get-aheads (~6:28pm)
- 3/22 (FD13) – EVA-5 to stow OBSS, TBDs (~5:23pm)
- 3/24 (FD15) – STS-123/Endeavour undocking (~7:55pm)
- 3/26 (FD17) – STS-123/Endeavour deorbit (~7:33pm); landing (KSC) -- ~8:35pm;

03/14/08 -- ATV1 “Jules Verne” CAM (Collision Avoidance Maneuver) Demo, -5m/s, 4:00am-5:30am EDT;
03/19/08 -- ATV1 “Jules Verne” parking point (loiter) arrival 8:00am EDT ~1200 mi. in front of ISS;
03/27/08 – ATV1 end of loiter; leave parking point - ~2:00am;
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03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
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10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)

11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
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1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/13/08
Date:	Thursday, March 13, 2008 2:49:40 PM
Attachments:	

ISS On-Orbit Status 03/13/08

All ISS systems continue to function nominally, except those noted previously or below. *Crew sleep cycle today: sleep 8:00am–4:30pm; wake 4:30pm–8:00am tomorrow.*

STS-123/Endeavour docked smoothly last night at 11:49pm EDT at the PMA-2 (Pressurized Mating Adapter-2) port, 24 minutes behind schedule (due to loss of target lock by the CW (Continuous Wave) laser of the Shuttle's TCS (Trajectory Control Sensor) during the manual rendezvous phase, requiring manual lock re-acquisition). The RPM (R-Bar Pitch Maneuver) started at 10:26pm and was successfully completed at 10:34pm, with Whitson and Malenchenko taking 200-300 close-up photographs of Endeavour's bottom heatshield. The station now hosts ten occupants again as Mission 1J/A is underway. *[At the point of docking, Peggy Whitson rang the traditional ship's bell and announced "Endeavour landed!" The combined crew is comprised of ISS CDR Whitson, FE-1 Yuri Malenchenko, FE-2 Léopold Eyharts, STS CDR Dominic Gorie, PLT Gregory Johnson, MS1 Robert Behnken, MS2 Mike Foreman, MS3 Takao Doi (Japan), MS4 Rick Linnehan, and MS5/FE-2-16 Garrett Reisman who replaces Eyharts as FE-2, as the latter returns on the Endeavour as MS-5.]*

After the docking, the station was reoriented as usual to minimize the risk of micrometeoroid/debris impacts upon the Shuttle (-x-axis in velocity vector, +z-axis in local vertical, i.e. Shuttle trailing).

After hatches open at 1:36am, the new crew was welcomed aboard the ISS and given the mandatory 25-min. safety briefing.

CDR Whitson then configuring the transfer equipment which allows the Shuttle to supply oxygen (O_2) to the ISS PBAs (Portable Breathing Apparatus) in support of pre-EVA mask prebreathe for denitrogenation.

Before the airduct between ISS and the Shuttle was installed for ventilation, FE-1 Malenchenko performed the standard Orbiter atmosphere sampling using the Russian AK-1M sampler.

Yuri also switched USOS/RS (US Segment/Russian Segment) comm systems to their mated-flight mode.

Garrett Reisman assisted MS-3 Doi on the Orbiter deck in releasing the SLP-D1 PRLA (Spacelab Pallet Payload Retention Latch Assembly), after which PLT Johnson and MS1 Behnken maneuvered the SRMS (Shuttle Remote Manipulator System) to grapple and transfer the SLP, which carries the SPDM (Special Purpose Dexterous Manipulator), to the POA (Payload ORU Attachment) on the Robotics MBS/MT (Mobile Base System/Mobile Transporter) where it was berthed. *[Dextre is too large to be assembled in the Shuttle cargo bay since it would interfere with cargo bay closure in an emergency. It will therefore be assembled at the MBS on the main truss, at Workstation 6 (WS6).]*

SPDM Power Glitch: After successful SLP PDGF (Power & Data Grapple Fixture) connection to the POA, with electrical connectivity confirmed, repeated attempts to activate the SPDM PSU (Power Switching Unit) for powering on the “keep-alive” heaters were unsuccessful. Engineers are suspecting a software timing issue, i.e., too little time for the Lab RWS (Robotics Work Station) between applying power to the PSU and establishing data comm. A software patch is in work to modify the timer settings to increase the time span. It is expected that the patch will be available on orbit in 24-48 hrs. There are no thermal constraints with the SPDM on the POA as long as all blankets remain installed. There exists a thermal limit (TTL) of ~5 days for the OTCM1 (ORU Tool Changeout Mechanism 1), but no constraints for OTCM2. If the patch is unsuccessful, an alternate power-up path would be tried from the SSRMS (Space Station Remote Manipulator System) by latching it to the SLP PDGF. If still unsuccessful, thermal limitation can be extended if EVA-1 & EVA-2 are modified to leave the current thermal protection blankets in place.

Other crew activities after the SLP transfer included:

- *Transfer of IELKs:* Garrett Reisman transferred his IELK (Individual Equipment Liner Kit) from the Shuttle to the Soyuz TMA-11/15S crew return vehicle where Yuri Malenchenko installed it for the new FE-2. Leo Eyharts’ IELK was pulled out and temporarily stowed for return on a future flight.
- *Sokol leak test:* Malenchenko and Reisman also performed the standard leak checkout on Garrett’s Sokol space suit which he would wear as a Soyuz passenger, then set it up for “drying out”.
- *Food Frequency Questionnaire:* Leo Eyharts filled out the regular FFQ (Food Frequency Questionnaire), his fourth, on the MEC (Medical

Equipment Computer) *[by means of these FFQs, NASA/ESA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins];*

- *EVA-1 Preparations:* For tonight's first spacewalk by Linnehan and Reisman, Peggy Whitson worked in the Airlock (A/L), installing the REBAs (Rechargeable EVA Battery Assemblies) in the EMUs (checkout of REBA-powered suit equipment and tools was waived to get back on the timeline after the delayed docking), while Reisman configured the A/L E/L (Equipment Lock) and Peggy and Leo later set up the DCS-760 camera for the EVA and initiated charging the DCS battery (at least 3 hrs).

In preparation for tonight's transfer of the "Kibo" JLP (Japanese Experiment Logistics Module-Pressurized Section) from the cargo bay to the Node-2 zenith (upper) CBM (Common Berthing Mechanism), Eyharts powered up the CBCS (Centerline Berthing Camera System) at the zenith hatch for a video checkout of the setup from the Orbiter Shuttle and later deactivated it again.

Yuri Malenchenko worked with the ground on activating of the Elektron oxygen generator at 32 amps, first pressurizing the BZh Liquid Unit with N_2 (nitrogen) via laptop and later monitoring the external temperature of its secondary purification unit (BD) for the first 10 minutes of operations to ensure that there was no overheating. *[During nominal operations a gas analyzer is utilized to detect hydrogen (H_2) in the O_2 line (which could cause overheating) but is not included in the control algorithm until 10 minutes after Elektron startup. A new EMI filter, recently (2/9) installed on the Elektron's current stabilizer (FPP ST-64), is designed to prevents RFI (radio frequency interference) with the ATV/Automated Transfer Vehicle).]*

Before sleep time, Malenchenko terminated the regeneration process on absorbent bed #1 of the Russian BMP (Harmful Impurities Removal System). Bake-out of bed #2 will follow tonight after wake-up (~5:03pm). *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods.]*

Working from the voluntary "available time" suggestions list, Yuri Malenchenko conducted the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder).

A second task list item for the FE-1 this morning was the daily monitoring, picture-

taking and downloading for the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

For both crews, currently asleep, workday begins later today at 4:30pm EDT. Rick Linnehan and Garrett Reisman are on “Campout” (*nachalo desaturatsiy* = desaturation start) in the A/L CL (Crewlock), after hatch closure this morning at ~7:40am. The two spacewalkers performed PBA (Portable Breathing Apparatus) mask prebreathe for denitrogenation, while readying their tools & equipment, then depressed the CL from 14.7 to 10.2 psi for their sleep period. *[For the Campout, fresh METOX (Metal Oxide) canisters are installed in the A/L for CO_2 control.]*

The CL hatch will be cracked (i.e., temporarily repressurized) at ~5:10pm tonight for a hygiene break/with mask prebreathe for Reisman and Linnehan. Around 5:55pm, the hatch will be closed again for EVA preps in 10.2 psi, followed by EMU purge & prebreath. Afterwards, Peggy and Mike will support CL depressurization, and EV1 & EV2 will egress around 9:23pm. *[EVA-1 will last approximately 6.5 hrs, ending at ~4:00am (ISS crew sleep begins at 8:00am). Its major objectives are: (1) prepare for JLP unberthing in cargo bay; (2) install OTCM2 with the Node-2 PDGF-based SSRMS, (3) remove and install OTCM1 (with SSRMS); (4) prepare for SPDM assembly, leaving thermal covers intact; (5) cleanup & ingress.]*

ATV “Jules Verne” Update (Flight Day 4): All ATV systems continue to perform nominally. Yesterday, ATV successfully performed two additional maneuvers to test PDE (Propulsion Drive Electronics) thruster configuration B (PDE-3 & -4). The first burn, TP1, began at 9:12:23am EDT, with a delta-V of 6.21 m/s; the second, TP2, at 10:01:29am, with a delta-V of 6.12 m/s. Both PDEs and He (helium) pressure regulation performed nominally, and ATV-CC/Toulouse reported that the boosts were nominal. Based on ATV GPS (Global Positioning System) data, specialists estimate that the post-maneuver state was within 100 m in semi-major axis of ATV-CC prediction. In addition, NASA-GSFC successfully performed coherent TDRSS tracking before and after the maneuver that confirmed the maneuver results. Per the nominal plan, at 1:55pm ATV performed an attitude slew (for a Helium purge), during which a thruster temperature differential alarm was annunciated that resulted in PDE-2 being switched off by the ATV FDIR (Fault Detection, Isolation & Recovery) system, although the ATV completed the slew maneuver nominally. Toulouse believes the cause to be FDIR thresholds set too low, and efforts are underway to update the limit settings, after which the PDE will be re-integrated into the propulsive system. At this time, there is no reason to believe that this anomaly is related to the earlier problem with the Helium pressurant system that resulted in PDE-2 being shut down.

Columbus Update: BLBGB (BIOLAB Glovebox) remains inoperable; one of its two rotors is jammed, rendering four ECs (Experiment Containers) on the other centrifuge inaccessible. The remaining four ECs (of 8 total) are recovered and secured in the TCU (Thermal Control Unit) for return. FSL (Fluid Science Laboratory) is not working, pending restoration with a new bus connector. SOLAR is working but degraded due to a technical problem. EuTEF: six of 9 experiments are running; three are in troubleshooting process.

ISS Crew Sleep Shift Planning: To synchronize the ISS crew's timeline with STS-123/1J/A docking and subsequent docked activities, Peggy's, Yuri's and Leo's wake/sleep cycle is undergoing a number of shifts which started on 3/11. For the next six days, the wake/sleep shift schedule is as follows (all times EDT):

FD4	Wake: 4:30pm (3/13) – 8:00am (3/14) Sleep: 8:00am – 4:30pm (3/14)
FD5	Wake: 4:30pm (3/14) – 7:00am (3/15) Sleep: 7:00am – 3:30pm (3/15)
FD6	Wake: 3:30pm (3/15) – 7:00am (3/16) Sleep: 7:00am – 3:30pm (3/16)
FD7	Wake: 3:30pm (3/16) – 6:00am (3/17) Sleep: 6:00am – 2:30pm (3/17)
FD8	Wake: 2:30pm (3/17) – 6:00am (3/18) Sleep: 6:00am – 2:30pm (3/18)
FD9	Wake: 2:30pm (3/18) – 5:00am (3/19) Sleep: 5:00am – 1:30pm (3/19)

ISS Orbit *(as of this morning, 8:44am EDT [= epoch]):*
Mean altitude -- 340.6 km
Apogee height -- 341.5 km
Perigee height -- 339.8 km
Period -- 91.35 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.000131
Solar Beta Angle -- 16.0 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 173 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53343

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

- 3/13 (FD4) – EVA-1 to install "Kobi" JLP and OTCMs on SPDM "Dextre" (~9:23pm)
- 3/15 (FD6) – EVA-2 to continue SPDM assembly if power restored

(~8:23pm)

- 3/17 (FD8) – EVA-3 to transfer ORUs, cleanup SLP, install MISSE-6, etc. (~7:23pm)
- 3/20 (FD11) – EVA-4 to demonstrate T-RAD, do get-aheads (~6:28pm)
- 3/22 (FD13) – EVA-5 to stow OBSS, TBDs (~5:23pm)
- 3/24 (FD15) – STS-123/Endeavour undocking (~7:55pm)
- 3/26 (FD17) – STS-123/Endeavour deorbit (~7:33pm); landing (KSC) -- ~8:35pm;

03/14/08 -- ATV1 “Jules Verne” CAM (Collision Avoidance Maneuver) Demo, -5m/s, 4:00am-5:30am EDT;
03/19/08 -- ATV1 “Jules Verne” parking point (loiter) arrival 8:00am EDT ~1200 mi. in front of ISS;
03/27/08 – ATV1 end of loiter; leave parking point - ~2:00am;
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch - ~7:16am
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~8:43am
04/19/08 -- Soyuz TMA-11/15S undocking/landing (FGB nadir port)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch

11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/12/08
Date:	Wednesday, March 12, 2008 2:49:11 PM
Attachments:	

ISS On-Orbit Status 03/12/08

All ISS systems continue to function nominally, except those noted previously or below. *Crew wake/sleep cycle today: sleep 6:30am–3:00pm; wake 3:00pm–8:00am tomorrow.*

STS-123/Endeavour continues its chaser flight for tonight's docking at ~11:25pm EDT, to begin ISS Stage 1J/A. (Catch-up rate ~480 nmi. per revolution of ~92 min). *[Hatch opening is expected at ~1:08am, followed by: Safety Briefing, Soyuz seat liner transfer (for the Eyharts/Reisman exchange), SRMS (Shuttle Remote Manipulator System)- transfer of SLP-D1 (Spacelab Pallet Deployable 1), carrying SPDM "Dextre", from Shuttle cargo bay to POA (Payload ORU Attachment) on MBS (Mobile Base System) at ~2:30am, and preparations for the first spacewalk, EVA-1, to be conducted by EV1 Linnehan & EV2 Reisman on 3/13 (~9:23pm EDT), preceded by their "overnight" Campout tomorrow (6:43am-7:45pm) in the Airlock (A/L) for denitrogenation/pre-breathe. Main objectives of the nominal 16-day mission: Installation of the 18,490-lbs ELM-PS or JLP (Japanese Experiment Logistics Module-Pressurized Section) and the 3,400-lbs Canadian SPDM (Special Purpose Dexterous Manipulator) "Dextre", delivering new ISS-16 crewmember Garrett Reisman & bringing Léopold Eyharts back home, and conducting a total of five EVAs. Landing will nominally take place at KSC on FD17 (3/26) at ~8:35pm EDT.]*

Early this morning, before begin of today's sleep period (6:30am), the ISS crew completed a number of pre-docking preparations. *(See yesterday's On-Orbit Status report for pre-midnight activities.)*

After installing the BPMSU (Battery Powered Speaker Microphone Unit) last night, with its dual drag-through cables, including VDS VTR (Video Distribution System/Video Tape Recorder) bypass cables for passing video to and from the station on the Lab's starboard side and allowing the station to receive video from the Orbiter on the Lab's port side, CDR Whitson this morning configured the DCS-760 digital cameras in the Service Module (SM) for tonight's RPM (R-bar Pitch Maneuver) photo shoot. *[The two cameras, one with 400mm lens (Peggy), the other with an*

800mm lens (Yuri), were equipped with fully charged batteries transferred from the A/L by Leo Eyharts, and freshly formatted flash storage cards.]

FE-1 Malenchenko used the Russian AK-1M sampler to take pre-docking air samples in the SM and FGB. He will perform another sampling post-docking immediately after the standard all-hands safety briefing (~1:30am).

The CDR set up the updated DOUG (Dynamic Orbital Ubiquitous Graphics) laptop software at the Lab RWS (Robotics Workstation) in preparation for the upcoming pre-Robotics review of SSRMS (Space Station Remote Manipulator System) procedures during 1J/A.

Afterwards, Whitson performed the one-hour pressurization process on the PMA-2 (Pressurized Mating Adapter #2), followed by leak checking and additional preparations of the PMA for the Shuttle's docking *[leaving the pressurization jumper gear connected for the post-docking leak checks tonight]*.

In preparation for upcoming urine transfer to the Progress M-63/28P Rodnik BV1 water tank, Malenchenko conducted the regular compressor test activation to inflate and pressurize the cargo ship's BV1 tank bladder. *[The pressurization of the collapsed bladder of the Rodnik water storage tank is conducted as a leak check, preparatory to the liquid waste transfer to the tank for disposal. Each of the two spherical Rodnik tanks consists of a hard shell with a soft membrane (bladder) composed of elastic fluoroplastic. The bladder is used to expel water from the tank by compressed air pumped into the tank volume surrounding the membrane.]*

In the Columbus module, FE-2 Eyharts finished close-out activities on the completed BLB/WAICO #1 (BIOLAB/Waving & Coiling of Arabidopsis Roots at Different g-levels) experiment which were stopped yesterday by an anomaly with the centrifuges. *[During the WAICO finalization and fixation, the centrifuges, which are required for the fixation process (injection of formaldehyde into the ECs/Experiment Containers), became locked and would not rotate, despite repeated power cycling by ground controllers and Eyharts. Ground teams were to develop a plan for Leo to move the WAICO samples into the TCU (Thermal Control Unit).]*

FE-1 Malenchenko completed the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Yuri also performed the IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Working from the voluntary “available time” suggestions list, Yuri Malenchenko conducted the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder).

A second task list item for the FE-1 this morning was the daily monitoring, picture-taking and downloading for the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems {Russian: IMBP}).

Before sleep time, Malenchenko terminated the regeneration process on absorbent bed #1 of the Russian BMP (Harmful Impurities Removal System). Bake-out of bed #2 will follow tonight after wake-up (~5:03pm). *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods.]*

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1). More exercise sessions are scheduled tonight before docking.

After their 8.5-hr. sleep period ends later today at ~3:00pm, the crew will complete final pre-docking activities:

- Verification of the readiness of the DCS-760 digital cameras for the RPM photography of Endeavour, followed later (~10:24pm) by the rapid-fire RPM shooting session (Whitson & Malenchenko);
- Configuring the Russian telephone/telegraph subsystem (STTS) to its pre-docking settings, which includes setting up the VHS (UHF) channel to the approaching Shuttle Orbiter (Malenchenko); after the docking, the FE-1 will switch USOS/RS (US Segment/Russian Segment) comm systems to their mated-flight mode;
- Preparation of the headset extension cable from the FGB PGO (Instrumentation Cargo Compartment) communications panel to the SM to support the RPM session (Eyharts);
- Retrieving and stowing the four FMK (Formaldehyde Monitoring Kit) units deployed by Peggy on 3/10 in the Lab and SM to catch any atmospheric formaldehyde (Eyharts).

Additionally, Leo will

- Close the Lab science window shutters to protect against thruster plume contamination,
- Set up and later activate the timers marking beginning and end of Peggy's and Yuri's Orbiter bottomside photo session, and
- Prepare to shoot video of the approach and docking of Endeavour.

Before the docking, the FE-1 is scheduled to conduct his fifth recharging of the Motorola Iridium-9505A satellite phone brought up on Soyuz 15S, a monthly routine job. *[After retrieving it from its location in the TMA-11/15S descent module (BO) at ~6:00pm EDT, Yuri will initiate the recharging of its lithium-ion battery, monitoring the process every 10-15 minutes as it takes place. Upon completion at ~7:30pm, the phone is to be returned inside its SSSP Iridium kit and stowed back in the BO's operational data files (ODF) container. The satphone accompanies returning ISS crews on Soyuz reentry & landing for contingency communications with SAR (Search-and-Rescue) personnel after touchdown (e.g., after an "undershoot" ballistic reentry). The Russian-developed procedure for the monthly recharging has been approved jointly by safety officials. During the procedure, the phone is left in its fire-protective fluoroplastic bag with open flap. The Iridium 9505A satphone uses the Iridium constellation of low-Earth orbit satellites to relay the landed Soyuz capsule's GPS (Global Positioning System) coordinates to helicopter-borne recovery crews. The older Iridium-9505 phones were first put onboard Soyuz in August 2003. The newer 9505A phone, currently in use, delivers 30 hours of standby time and three hours of talk, up from 20 and two hours, respectively, on the older units.]*

Afterwards, in preparation for docking (~11:25pm) and subsequent hardmate, the crew configures the Russian MCS (Motion Control System) for the automatic "PMA-2 Arrival" mode, an operational sequence used to monitor Orbiter arrival at the PMA-2. *[At "Capture Confirmed", ISS attitude will be immediately set to "free drift" to allow dampening out relative motions of ISS and Endeavour (with the ODS dampers/shock absorbers), then maneuvers to "Mated TEA" (Torque Equilibrium Attitude) to account for the new overall configuration with Endeavour docked.]*

ATV Update (Flight Day 3): All ATV systems continue to perform nominally. Yesterday, the ATV successfully performed two maneuvers to test the nominal PDE (Propulsion Drive Electronics) configuration (PDE-1 & -2). The first maneuver, TE1, began at 11:01:09am EDT and had a delta-V of 6.00 m/s. The second maneuver, TE2, began at 12:12:39pm, with a delta-V of 5.92 m/s. Both PDEs performed nominally, and ATV-CC (ATV Control Center/Toulouse) reported that the boosts and He (helium) pressure regulators were nominal. Based on ATV GPS (Global Positioning System) satellite data, ballistics specialists estimate that the post-

maneuver state was within 100 m in semi-major axis of the ATV-CC prediction. As planned, another pair of 6 m/s test burns was executed today (3/12) with PDE-3 and -4, at 9:20am & 10:05am respectively, to exercise the other set of He regulators. Both of them were successful. ATV is resuming the now slightly delayed mission plan. Between now and Parking Orbit Departure, Toulouse will catch up on the timeline to preserve the originally planned dates of the Demo Days and Docking.

ISS Crew Sleep Shift Planning: To synchronize the ISS crew's timeline with STS-123/1J/A docking and subsequent docked activities, Peggy's, Yuri's and Leo's wake/ sleep cycle is undergoing a number of shifts which started on 3/11. For the next six days, the wake/sleep shift schedule is as follows (all times EDT):

FD3	Wake: 3:00pm (3/12) – 8:00am (3/13) Sleep: 8:00am – 4:30pm
FD4	Wake: 4:30pm (3/13) – 8:00am (3/14) Sleep: 8:00am – 4:30pm
FD5	Wake: 4:30pm (3/14) – 7:00am (3/15) Sleep: 7:00am – 3:30pm
FD6	Wake: 3:30pm (3/15) – 7:00am (3/16) Sleep: 7:00am – 3:30pm
FD7	Wake: 3:30pm (3/16) – 6:00am (3/17) Sleep: 6:00am – 2:30pm
FD8	Wake: 2:30pm (3/17) – 6:00am (3/18) Sleep: 6:00am – 2:30pm

ISS Orbit *(as of this morning, 8:40am EDT [= epoch]):*
Mean altitude -- 340.8 km
Apogee height -- 341.7 km
Perigee height -- 339.9 km
Period -- 91.35 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0001377
Solar Beta Angle -- 11.1 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 160 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53327

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
03/12/08 -- STS-123/Endeavour/1J/A docking – ~11:25pm EDT

- 3/13 (FD3) – Use SRMS to transfer SLP-D1 with SPDM to ISS (POA) (~1:30am)
- 3/13 (FD4) – EVA-1 to install "Kibo" JLP and start SPDM "Dextre"

assembly (~9:23pm)

- 3/15 (FD6) – EVA-2 to continue SPDM assembly (~8:23pm)
- 3/17 (FD8) – EVA-3 to transfer ORUs, cleanup SLP, install MISSE-6, etc. (~7:23pm)
- 3/20 (FD11) – EVA-4 to demonstrate T-RAD, do get-aheads (~6:28pm)
- 3/22 (FD13) – EVA-5 to stow OBSS, TBDs (~5:23pm)
- 3/24 (FD15) – STS-123/Endeavour undocking (~7:55pm)
- 3/26 (FD17) – STS-123/Endeavour deorbit (~7:33pm); landing (KSC) -- ~8:35pm;

03/14/08 -- ATV1 “Jules Verne” CAM (Collision Avoidance Maneuver) Demo, -5m/s, 3:56am EDT;
03/19/08 -- ATV1 “Jules Verne” parking point (loiter) arrival 8:00am EDT ~1200 mi. in front of ISS;
03/27/08 – ATV1 end of loiter; leave parking point - ~2:00am;
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch - ~7:16am
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~8:43am
04/19/08 -- Soyuz TMA-11/15S undocking/landing (FGB nadir port)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)

11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/11/08
Date:	Tuesday, March 11, 2008 2:36:30 PM
Attachments:	

ISS On-Orbit Status 03/11/08

All ISS systems continue to function nominally, except those noted previously or below. *Crew wake/sleep cycle today: wake-up 2:00am; sleep 12:00noon (4-hr "nap"); wake-up 4:00pm – 6:30am (tomorrow).*

STS-123/Endeavour (ISS-1J/A) lifted off spectacularly in darkness early this morning right on time (2:28am EDT) with all systems performing nominally, for rendezvous with ISS tomorrow (3/12, Wednesday) and docking at approximately 11:25pm EDT. The Orbiter is carrying the seven-member crew of Commander Dominic L. Gorie, Pilot Gregory H. Johnson and Mission Specialists Richard M. Linnehan, Robert L. Behnken, Michael J. Foreman, Takao Doi and Garrett E. Reisman. Reisman will replace Léopold Eyharts as ISS Flight Engineer 2, who returns on 3/26 (nominal) with STS-123. STS-123 is the 122nd space shuttle flight, the 21st flight for Endeavour, the 25th flight to the station and the second of six Shuttle flights planned for 2008 (including the Hubble Service Mission 4). Its primary payloads are the 18,490-lbs Japanese Experiment Logistics Module-Pressurized Section (ELM-PS or JLP) and the 3,400-lbs Canadian Special Purpose Dexterous Manipulator (SPDM) "Dextre". **We are off to another great mission!**

Before breakfast & first exercise, Whitson, Malenchenko and Eyharts completed a full session with the Russian crew health monitoring program's medical assessment MO-9/Biochemical Urinalysis. Afterwards, the FE-1 closed out and stowed the Urolux hardware. *[MO-9 is conducted every 30 days (and also before and after EVAs) and is one of five nominal Russian medical tests adopted by NASA for U.S. crewmembers for IMG PHS (Integrated Medical Group/Periodic Health Status) evaluation as part of the "PHS/Without Blood Labs" exam. The analysis uses the sophisticated in-vitro diagnostic apparatus Urolux developed originally for the Mir program. Afterwards, the data are entered in the MEC (Medical Equipment Computer)'s special IFEP software (In-Flight Examination Program).]*

/In the Columbus module, FE-2 Eyharts performed close-out activities on the

completed BLB/WAICO #1 (BIOLAB/Waving & Coiling of Arabidopsis Roots at Different g-levels) experiment, shutting down all unused subsystems, removing the ECs (Experiment Containers) from the incubator for final stowage in the BLBG TCU (BLBGlovebox Thermal Control Unit 1), set at +4 degC, and removing the video tape from the camcorder. *[The WAICO samples, which required a 14-day growing period, will be returned on Flight 1J/A along with the video tape.]*

FE-1 Malenchenko continued the long-term leak checking of the spare BZh Liquid Unit (#056) for the Elektron O_2 generator by charging the unit once again with pressurized N_2 from the BPA-M Nitrogen Purge Unit (#23) to 1 atm (1 kg/cm^2), for the subsequent periodic pressure check. The last test pressurization was on 1/9/08. *[During Elektron operation, the inert gas locked up in the BZh has the purpose to prevent dangerous O_2/H_2 mixing. A leaking BZh cannot be used.]*

CDR Whitson serviced the prime CSA-CP (Compound Specific Analyzer-Combustion Products), replacing its battery with a fresh one (#1167).

The three crewmembers had their standard periodic PMC (Private Medical Conference) via S- & Ku-band audio/video.

Working from the voluntary “available time” suggestions list, Yuri Malenchenko conducted the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder).

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR) and VELO bike with bungee cord load trainer (FE-1).

Peggy Whitson then transferred the crew’s exercise data file to the MEC laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

The crew had an early dinner at ~10:30am (no lunch break today) and then began their sleep time at 12:00noon EDT as first step in the extensive sleep cycle shifting ahead.

After waking up from the 4-hr. “nap” at ~4:00pm later today, Leo Eyharts will move to the U.S. Airlock to start charging eight camera batteries in preparation for tomorrow night’s RPM (R-bar Pitch Maneuver) photo shoot by Whitson and

Malenchenko. Charging will be conducted on two sets of four batteries simultaneously, each one requiring at least three hours. *[The RPM will begin at ~10:24pm EDT in bright sunlight, followed by TORVA (Twice Orbital Rate V-bar Approach) initiation at ~10:35pm and V-bar arrival (310 ft in front of the station) at 10:46pm. Being below the ISS, the Orbiter will overtake it, passing through its "R-bar" radius vector at ~600 ft range while doing a slo-mo somersault for brief exposure of its belly to Peggy's & Yuri's cameras, then getting further ahead and rising up to match the station's orbital rate (velocity), followed by for lining up, starting final approach and concluding with docking at PMA-2 (Pressurized Mating Adapter 2).]*

Also for the upcoming high-pressure RPM photo activity, much of Whitson's attention later tonight and throughout the night will be on formatting the necessary camera storage devices. *[Formatting, in a Kodak DCS 760 camera on station power, will be performed on a total of eight 1GB EVA Flash Cards, each one taking ~20 minutes. Afterwards, the reformatted cards are to be transferred to the SM (Service Module) for the DCS 760 camera configuration to get ready for the RPM documentation.]*

Peggy will also perform the periodic offloading of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1054) with the collected water slated for processing. Two samples are required this time for return to Earth. *[Estimated offload time before termination (leaving ~6 kg in the tank): ~35 min.]*

Yuri Malenchenko's first job tonight after the nap will be the periodic servicing of the Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The regen process will be terminated tomorrow before sleeptime, at ~5:20am EDT. Regeneration of bed #2 follows after wake-up. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods.]*

The FE-1 is also scheduled to set up the equipment for his third session with the Russian experiment MBI-18 DYKHANIE ("respiration", "breathing"), then to tag up with ground specialists and conduct the session, finally closing down and stowing the equipment. *[Dykhanie-1 uses two body belts (PG-T/thoracic, PG-A/ abdominal), a calibrator, resistor, mouthpiece, etc., to study fundamental physiological mechanisms of the external breathing function of crewmembers under long-duration orbital flight conditions. During the experiment, physiological measurements are taken and recorded with a pneumotachogram, a thoracic pneumogram, an abdominal pneumogram, and pressure data in the oral cavity. All experimentally derived plus salient environmental data along with personal data of the subject are recorded on PCMIA card for return to the ground at end of the*

Expedition. Objectives include determining the dynamics of the relationship between thoracic (pectoral) and abdominal breathing function reserves and their realization potential during spontaneous breathing, the coordinated spontaneous respiratory movements in terms of thoracic and abdominal components of volumetric, time & rate parameters of spontaneous respiratory cycle, identification of the features of humoral-reflex regulation of breathing by dynamics of ventilation sensitivity of thoracic and abdominal components to chemoreceptor stimuli, etc. Overall, the experiment is intended to provide a better understanding of the basic mechanisms of pulmonary respiration/gas exchange gravitational relations of cosmonauts.]

In preparation for the upcoming docking, Leo will work on the Columbus FSL (Fluid Science Laboratory), temporarily re-attaching the FSL FCE (Facility Core Element) drawer structure to the rack by means of the four launch fixations bolts used during COL launch, as he did on 2/27 for the reboost. *[Afterwards, the launch captive bolts will be removed again and the protective gap covers re-installed. The need for the lock-down of the FCE was indicated by an updated structural analysis.]*

Eyharts is also scheduled to collect a Return-to-Ground water sample from the ITCS MTL (Internal Thermal Control System/Moderate Temperature Loop) in the Lab (LAB1D5 port) and another one later from the LTL (Low Temperature Loop) in Node-2.

For use by the Shuttle crew during the docked phase with the Orbiter, the CDR will unstow and configure the BPMSU (Battery Powered Speaker Microphone Unit) with its dual drag-through cable string and QDs (quick disconnects), along with video adapter cables *[The long dual strings, one going through Node-2 to the Lab, the other further on to Node-1 and its connecting modules, will be plugged in at a drag-through QD assembly at the PMA-2, with one half assigned to the station, the other to the Shuttle.]*

Also later tonight, FE-1 Yuri Malenchenko will set up the equipment for the Russian MBI-18 DYKHANIE (“respiration”, “breathing”) experiment, then conducted the session, supported by ground specialist tagup, later closing down ops and stowing the equipment. *[Dykhanie-1 gear uses two belts (PG-T/thoracic, PG-A/abdominal), a calibrator, resistor, mouthpiece, etc., to study fundamental physiological mechanisms of the external breathing function of crewmembers under long-duration orbital flight conditions. During the experiment, physiological measurements taken and recorded involve a pneumotachogram, thoracic pneumogram, abdominal pneumogram, and pressures in the oral cavity. All experimentally derived and salient environmental data along with personal data of the subject are recorded on PCMIA card for return to the ground at end of the Expedition. Objectives include determining the dynamics of the relationship between thoracic (pectoral) and*

abdominal breathing function reserves and their realization potential during spontaneous breathing, the coordinated spontaneous respiratory movements in terms of thoracic and abdominal components of volumetric, time & rate parameters of spontaneous respiratory cycle, identification of the features of humoral-reflex regulation of breathing by dynamics of ventilation sensitivity of thoracic and abdominal components to chemoreceptor stimuli, etc. Overall, the experiment is intended to provide a better understanding of the basic mechanisms of pulmonary respiration/gas exchange gravitational relations of cosmonauts.]

(Post-midnight onboard activities will be covered in tomorrow's Daily On-Orbit Report.)

ATV Update (Flight Day 2): All ATV systems are performing nominally. Yesterday, the ATV PDE-2 (Propulsion Drive Electronics #2) was successfully re-integrated at ~3:00pm EDT, returning the ATV to the nominal propulsion configuration with the redundant system available. Afterwards, the PDE was successfully used to complete an attitude slew maneuver to return to Yaw Steering, the nominal ATV attitude control mode. Two test maneuvers using Configuration A (PDE-1 & -2) were scheduled for today (11:01am/12:12pm). Tomorrow (3/12), two additional test maneuvers will be performed using Configuration B (PDE-3 & -4), at 9:20am and 10:05am. The CAM (Collision Avoidance Maneuver) Test 1 is scheduled on 3/13 at 6:00am-10:00am and the CAM Demo now on 3/14 at 3:56am. Twelve more burns will be conducted in the ensuing days, with final arrival at the "loiter" position in Parking Orbit on 3/19 (~8:00am) at about 1200 mi. in front of ISS.

FSL Update: Yesterday's troubleshooting of the FSL (Fluid Science Klaboratoiry) Rack was unsuccessful. After powering on, data readouts were erratic. Further inspection showed that a jumper cable has a broken connector (J3), with two pins missing. FSL cannot be activated in this state.

SSC-13 Failure: As per crew report this morning, the SSC-13 (Station Support Computer 13) has failed (not loading its Operating System). The laptop is currently turned off, and the plan is to try reloading the hard drive.

ERNO Safety Issue: The recent installation of the ERNO (Entwicklungsring Nord) box by FE-2 Eyharts on the FSL starboard panel still needs to be assessed for safety by NASA & ESA before it can be activated (which is not planned for the next several weeks). *[The primary purpose of this SDTO (Station Development Test Objective) is to assess the on-orbit performance of various radiation devices inside the ERNO box. This hardware includes: LEON-2 CPU (Central Processing Unit) developed by ATMEL/France and ESA, new memory devices, large SRAM (Static Random Access Memory)-based FPGAs (Field-Programmable Gate Arrays), and MEMS (Microelectromechanical Systems) sensors. The radiation-hardened LEON-*

2 microprocessor chip is the first implementation of a LEON CPU-core in silicon, with SPARC compliance. SPARC (Scalable Processor Architecture), invented by Sun Microsystems Inc., is an open set of technical specifications that any person or company can license and use to develop microprocessors and other semiconductor devices based on published industry standards.]

ISS Crew Sleep Shift Planning: To synchronize the ISS crew's timeline with STS-123/1J/A docking and subsequent docked activities, Peggy's, Yuri's and Leo's wake/sleep cycle is undergoing a number of shifts which started today. For the next six days, the wake/sleep shift schedule is as follows (all times EDT):

FD2	Wake: 4:00pm (3/11) – 6:30am (3/12) Sleep: 6:30am – 3:00pm
FD3	Wake: 3:00pm (3/12) – 8:00am (3/13) Sleep: 8:00am – 4:30pm
FD4	Wake: 4:30pm (3/13) – 8:00am (3/14) Sleep: 8:00am – 4:30pm
FD5	Wake: 4:30pm (3/14) – 7:00am (3/15) Sleep: 7:00am – 3:30pm
FD6	Wake: 3:30pm (3/15) – 7:00am (3/16) Sleep: 7:00am – 3:30pm
FD7	Wake: 3:30pm (3/16) – 6:00am (3/17) Sleep: 6:00am – 2:30pm

ISS Orbit *(as of this morning, 9:34am EDT [= epoch]):*
Mean altitude -- 341.0 km
Apogee height -- 342.0 km
Perigee height -- 340.0 km
Period -- 91.35 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0001473
Solar Beta Angle -- 6.2 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 231 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53312

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
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03/19/08 -- ATV1 "Jules Verne" parking point (loiter) arrival 8:00am EDT ~1200 mi. in front of ISS;
03/24/08 -- STS-123/Endeavour/1J/A undocking -- ~7:55pm;

03/26/08 -- STS-123/Endeavour/1J/A deorbit – ~7:33pm; landing (KSC) -- ~8:35pm;
03/27/08 – ATV1 end of loiter; leave parking point - ~2:00am;
03/29/08 -- ATV1 Demo Day 1
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12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola

3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/10/08
Date:	Monday, March 10, 2008 1:51:13 PM
Attachments:	

ISS On-Orbit Status 03/10/08

All ISS systems continue to function nominally, except those noted previously or below. *Russian Holiday: International Women's Day ("held over" from 3/8). Underway: Week 21 of Increment 16.*

After consulting with Col-CC (Columbus Control Center) specialists, FE-2 Eyharts set up a video camcorder in front of the FSL RIC (Fluid Science Laboratory Rack Interface Controller) to monitor its LEDs, then performed an uplinked troubleshooting procedure on the FSL facility, using wire cutter, wire stripper and crimp tools in an effort to repair its LAN (Local Area Network) jumper that could not be connected with the UIP (Utility Interface Panel) J46 LAN-1 connector last week.

Later, Eyharts conducted photo documentation of the completed WAICO (Waving & Coiling of Arabidopsis Roots at Different g-levels) experiment, first configuring the DCS-760 camera equipment, then removing the ECs (Experiment Containers) from the centrifuge, taking imagery inside the BGB (BIOLAB Glovebox) and afterwards replacing the ECs on the gravity-simulating centrifuge.

In the Lab, CDR Whitson connected the regular ITCS LTL (Internal Thermal Control System/Low Temperature Loop) coolant jumper at the LAB1D6 rack in support of ground-commanded activation, at 4:00am-6:00am EDT, of the U.S. CDRA (Carbon Dioxide Removal Assembly). *[CDRA was turned on to reduce cabin CO_2 level prior to 1J/A docking.]*

Yuri Malenchenko completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV for the Elektron-intended water, and processing U.S. condensate*

water as it becomes available in a filled CWC (Contingency Water Container) from the Lab humidifier.]

CDR Whitson performed the periodic deployment of four passive FMK (formaldehyde monitoring kit) sampling assemblies in the Lab (at P3, below CEVIS) and SM (at the most forward handrail, on panel 307) for two days, to catch any atmospheric formaldehyde on a collector substrate for subsequent analysis on the ground. *[Two monitors each are usually attached side by side, preferably in an orientation with their faces perpendicular to the direction of air flow.]*

Working from the voluntary “available time” suggestions list, Yuri Malenchenko conducted the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder).

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

After the U.S. MCA (Major Constituent Analyzer) executed another ground-commanded “rapid sampling” auto sequence, Malenchenko performed the (currently daily) cabin air repress with O_2 from Progress 28P storage (SrPK).

Later, MCA mode was changed by the ground to standard sequence of four times each in Lab, Node-1, Airlock, Node-2 and Columbus.

At ~8:25am EDT, the Expedition 16 crew conducted the standard pre-handover teleconference (via S/G2 audio) with the Expedition 17 crew which is currently at GCTC (Gagarin Cosmonaut Training Center) at Star City (Zvezdniy Gorodok), near Moscow.

At ~10:45am, Peggy and Yuri linked up with ground specialists at MCC-H for a 15-min debrief to discuss the images downlinked from their recent (3/7) Shuttle RPM (R-bar Pitch Maneuver) skill training. *[The skill training prepares the crew for the bottom side mapping of the Endeavour at the arrival of STS-123/1J/A on Wednesday. During the RPM at ~600 ft from the station, the ISS crew will have only ~90 seconds for taking high-resolution digital photographs of all tile areas and door seals on the Orbiter, to be downlinked for launch debris assessment. Thus, time available for the shooting will be very limited, requiring great coordination between the two headset-equipped photographers and the Shuttle.]*

At ~4:27am, Leo Eyharts powered up the SM's amateur radio equipment (Kenwood

VHF transceiver with manual frequency selection, headset, and power supply), to conduct, at 4:32am, a ham radio exchange in French with students at the Lycee mixte René Gosse, Clermont L'Herault, F-34800, France. *[Named after René Gosse who was shot by the German Gestapo in 1943, the "Lycee" stands in the very heart of the medieval city of Clermont l'Herault, a renowned tourist place of about 6,000 inhabitants, situated in the Languedoc area, one of the sunniest regions of France. Most of its buildings date from the 14th century and are located on the site of an ancient Dominican monastery. The recently restored chapel of the Penitents, built in southern Gothic style, is still used both by the school to accommodate exams and conferences and by the town council as a cultural centre for various artistic events. Questions to Leo were uplinked by ARISS (Amateur Radio on ISS) beforehand. "Have you ever had a fish in the station? If so how did you manage to contain the water in which he lived? How did it move? How did it bear the take-off?"; "Why don't you build a station on the moon rather than in space?"; "What is your feeling when you are out of the station and you look at the Earth and space?"; "What is the first sensation you feel when you work outside the station?"; "What are the temperatures outside and inside the station?"; "How do you perceive the Sun from the international space station? Does it look like the one we can see from the Earth?"; "Do the molecules made or transformed in space keep the same properties when they are brought back to the Earth?"]*

ATV Update: ATV-1 "Jules Verne" lifted off on time Saturday night at 11:03:11pm EST. Ascent and the circularization burn by the upper stage were nominal. Separation from the Ariane 5 upper stage occurred at 12:09:42am. Deployment of solar arrays and PCE (Proximity Communications Equipment) antenna boom were also nominal. Yesterday (Sunday), ATVCC (ATV Control Center/Toulouse) deferred the first two phasing burns, TP1 (9:06am EDT) and TP2 (9:40am EDT), to first analyze an apparent problem with PDE-2 (Propulsion Drive Electronics #2), one of four PDEs, each one of which controls 7 of the 28 ACS (Attitude Control System) thrusters and one of the four OCS (Orbit Correction System) engines. Rescheduling the TP burns and any impact on tomorrow's scheduled CAM test remained undetermined this morning.

ISS Crew Sleep Shift Planning: To synchronize the ISS crew's timeline with STS-123/1J/A docking and subsequent docked activities, the wake/sleep cycle of Peggy, Yuri and Leo will undergo a number of shifts which, for an on-time launch tomorrow morning at 2:28am, start tomorrow (FD1). For the first six days, the wake/sleep shift schedule is as follows (all times EDT):

- FD1
  - Wake: 2:00am – 12:00noon
  - Sleep: 12:00noon – 4:00pm ("nap")

- FD2
  - Wake: 4:00pm (3/11) – 6:30am (3/12)
  - Sleep: 6:30am – 3:00pm

- FD3
  - Wake: 3:00pm (3/12) – 8:00am (3/13)
  - Sleep: 8:00am – 4:30pm

- FD4
  - Wake: 4:30pm (3/13) – 8:00am (3/14)
  - Sleep: 8:00am – 4:30pm

- FD5
  - Wake: 4:30pm (3/14) – 7:00am (3/15)
  - Sleep: 7:00am – 3:30pm

- FD6
  - Wake: 3:30pm (3/15) – 7:00am (3/16)
  - Sleep: 7:00am – 3:30pm

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 9:27am EDT [= epoch]):*
Mean altitude -- 341.2 km
Apogee height -- 342.0 km
Perigee height -- 340.4 km
Period -- 91.36 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0001254
Solar Beta Angle -- 1.2 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 180 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53296

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS (JLP) – 2:28am EDT, for a record 16+1+2 mission duration, incl. 5 EVAs;
03/12/08 -- ATV1 "Jules Verne" CAM (Collision Avoidance Maneuver) demo, 3:59:28am EDT; orbit raising burns;

03/12/08 -- STS-123/Endeavour/1J/A docking – ~11:27pm EDT
03/19/08 -- ATV1 “Jules Verne” parking point (loiter) arrival 8:00am EDT ~1200 mi. in front of ISS;
03/24/08 -- STS-123/Endeavour/1J/A undocking -- ~7:55pm;
03/26/08 -- STS-123/Endeavour/1J/A deorbit – ~7:33pm; landing (KSC) -- ~8:35pm;
03/27/08 – ATV1 end of loiter; leave parking point - ~2:00am;
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch - ~7:16am
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~8:43am
04/19/08 -- Soyuz TMA-11/15S undocking/landing (FGB nadir port)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**

3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/09/08
Date:	Sunday, March 09, 2008 2:19:56 PM
Attachments:	image001.gif

ISS On-Orbit Status 03/09/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday -- off-duty day for CDR Whitson, FE-1 Malenchenko & FE-2 Eyharts. Ahead: Week 21 of Increment 16.*

After a flawless, precise on-time launch last night at 11:03:04 pm EST at Kourou/French Guiana, ATV1 Jules Verne is on its way to the ISS *(see photo below).* *[Currently entering a period of test and orbit raising maneuvers, the European automated freighter will start "loitering" on 3/19 about 1200 miles ahead of ISS (which at that time is busy with STS-123/1J/A), then will begin maneuvering at 3/27, conduct checkout Demos toward an IMMT Go/No Go decision on 4/2, and Docking on 4/3 (start Final Approach: ~6:10am EDT, contact SM aft port: ~10:20am.]*

Aboard the ISS, Léopold Eyharts performed the last sampling of his second session with the NASA/JSC experiment NUTRITION w/Repository, collecting a final urine sample upon wakeup for storage in the MELFI (Minus-Eighty Laboratory Freezer for ISS). The sampling kit was then stowed away. *[The current NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R +30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

Yuri Malenchenko completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including ASU toilet facilities systems/replaceables plus the weekly collection of the toilet flush counter (SPK-U), water supply (SVO) readings and POTOK parameters

for calldown to TsUP/Moscow. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC (Contingency Water Container) from the Lab humidifier. Weekly SOZh reports (on Sundays) to TsUP/Moscow deal with number & dates of water and urine containers, counter readings of water consumption & urine collection, plus data and total operating time of the Russian POTOK-150MK (150 micron) air filter unit of the SOGS air revitalization subsystem.]*

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR) and VELO bike with bungee cord load trainer (FE-1, FE-2).

After a ground-commanded “rapid sampling” auto sequence by the U.S. MCA (Major Constituent Analyzer), Malenchenko performed another cabin air repress with O_2 from Progress 28P storage (SrPK). Later, MCA mode was changed by the ground to standard sequence of four times each in Lab, Node-1, Airlock, Node-2 and Columbus.

The FE-1 Malenchenko worked a number of standard maintenance/service tasks on Russian Segment (RS) systems from the voluntary “available time” suggestions list. Specifically, Yuri -

- Ran the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder);
- Performed the daily monitoring, picture-taking and downloading on the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP), including recharging the water tank of the greenhouse as required;
- Conducted the periodic collection and logging of accumulated data of seven Bubble Dosimeter detectors of the “Matryoshka-R” radiation payload suite (RBO-3-2) installed at various exposure locations in the RS, using the special Bubble Dosimeter Reader *[the complex Matryoshka payload suite is designed for sophisticated radiation studies];*
- Performed another session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program, using the Japanese HDV (High Definition) video camera provided by SFP Charles Simonyi to shoot video of the Pyrenees, Western Mediterranean, Spain, African & Madagascar terrain left of track, Azores &

Canary Islands, US Southern Coastline, Cuba, the Caribbean Sea right of track; and

- Completed his ninth run of the Russian DZZ-2 "Diatomeya" ocean observations program *[using the NIKON F-5 digital still camera with 80-200 mm lens and the SONY PD-150P camcorder at medium zoom for continuous nonstop video, focusing on high production zones and associated oceanic phenomena in the Atlantic Ocean (Newfoundland Island coastline, West Saharan offshore areas, and US coastline).]*

CWC Update: An updated CWC (Contingency Water Container) "cue card" was uplinked for the crew's reference. *[The new card (16-0018W) lists 35 CWCs (~1355.2 L total) for the four types of water identified on board: technical water (792.9 L, for Elektron, flushing, hygiene), potable water (559.6 L), condensate water (2 L), waste/EMU dump and other (0.7 L). Of the 35 containers, 12 CWCs with technical water (519.9 L) and 2 CWCs with potable water (88.7 L) must be cleared for* Wautersia *bacteria by MCC-H before use.]*

Did you know? –

- Jules Verne had a total mass 20,750 kg (45,746 lbs) at liftoff and carries 5752 kg of ATV propellant (Demos, ISS Reboost/Attitude Control, Contingency), 860 kg ISS refuel propellant, 20 kg oxygen gas, 280 kg water, and 1150 kg varied dry cargo.
- STS-122/1E Atlantis, besides crewmember rotation, accomplished the following payload/cargo transfers:
    - Cargo Bay hardware upmass to ISS: 29,105 lbs (i.e., Columbus 26,627 lbs; SOLAR 751 lbs; EuTEF 658 lbs; NTA 1069 lbs);
    - ISS hardware downmass in Cargo Bay: 2242 lbs (i.e., NTA 1039 lbs; CMG: 1203 lbs);
    - Shuttle Middeck Resupply to ISS: 2079 lbs (i.e., SARJ DLA; OTSD/ ORU Transfer Stowage Device);
    - ISS return items in Shuttle Middeck: 2022 lbs (i.e., BMRRM (largest ORU returned in middeck, 242 lbs), TBA/Trundle Bearing Assembly, 8 CPAs/Controller Panel Assemblies.

No CEO photo targets uplinked for today.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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Eccentricity -- 0.0001732
Solar Beta Angle -- -3.8 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 138 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53280

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
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03/26/08 -- STS-123/Endeavour/1J/A deorbit – ~7:33pm; landing (KSC) -- ~8:35pm;
03/27/08 – ATV1 end of loiter; leave parking point - ~2:00am;
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
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08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
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10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)

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10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Launch of ATV1 “Jules Verne” on Ariane 5 (3/8/08)

(Photo: ESA)

Note: The daily ISS On-Orbit Status reports can also be found at http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/08/08
Date:	Saturday, March 08, 2008 3:47:40 PM
Attachments:	

ISS On-Orbit Status 03/08/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday -- off-duty day for CDR Whitson, FE-1 Malenchenko & FE-2 Eyharts except for housekeeping and voluntary work.* ***>>>Tonight's BIG EVENT: Launch of ATV Jules Verne*** *(see Ascent Timeline below).*

For his second run with the NASA/JSC experiment NUTRITION w/Repository, FE-2 Eyharts completed the all-day session, collecting urine samples for 24 hrs (to continue through tomorrow morning) and blood samples (for Serum & Heparin). *[Acting as operator and CMO (Crew Medical Officer), Peggy Whitson performed phlebotomy on Leo, i.e., drew blood samples (from an arm vein) which were first allowed to coagulate in the Repository, then spun in the HRF2 RC (Human Research Facility 2/Refrigerated Centrifuge) and finally placed in MELFI (Minus-Eighty Laboratory Freezer for ISS). The RC was later powered off after a temperature reset to limit wear on the compressor, and cleaned.* *Background: NUTRITION is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight; this includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes. The Clinical Nutritional Assessment profile currently required on all U.S. Astronauts collects blood and urine samples preflight and postflight. NUTRITION expands this protocol by also capturing in-flight samples and an additional postflight sample. Furthermore, additional measurements are included for samples from all sessions, including additional markers of bone metabolism, vitamin status, and hormone and oxidative stressor tests. The results will be used to better understand the impact of countermeasures (exercise and pharmaceuticals) on nutritional status and nutrient requirements. The Clinical Nutritional Assessment profile (MR016L), first started on two Mir crewmembers and then on all ISS US crews, nominally consists of two pre-flight and one post-flight analysis of nutritional status, as well as an in-flight assessment of dietary intake using the FFQ (Food Frequency*

Questionnaire). The current NUTRITION project has expanded MR016L testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]

For her chosen weekend VolSci (Voluntary Science) program today, the NASA/U. Nevada SWAB (Surface, Water & Air Biocharacterization) experiment, Dr. Whitson swabbed surface samples from several locations in the station interior plus from five random sites (selecting an air vent in the Lab, the hygiene station mirror in the Service Module {SM}, a panel in the FGB next to mirror 206, a ventilation grill in Node-2, and return ventilation air vents in Columbus). Afterwards, she also collected air samples at four locations in the Node and Lab. *[The samples were sealed in special SWAB tubes, labeled as to their location origins and prepared for return to Earth on 1J/A. SWAB started on Increment 13 before 12A docking.]*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the SM dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the CDR's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

As part of the house cleaning, FE-1 Malenchenko conducted preventive maintenance cleaning on the FS5, FS6, FS9, VPkhO, VdPrK, & VPrK fan grilles in the SM, the V3 grille in the DC1 Docking Module, and the TsV2 fan inlet in the FGB (Funktsionalnyi-Grusovoi Blok).

After his second session with the ELITE-S2 (Elaboratore Immagini Televisive - Space 2) payload yesterday (which inadvertently exceeded Flight Rule-dictated acoustic loads on the crew), Eyharts powered on the payload to allow downloading the accumulated results and later deactivated it again. *[The Italian (ASI) experiment ELITE-S2 is a human motion analysis facility for technological characterization and potential application for multifactorial movement analysis, to study the connection between brain, visualization and motion in micro-G. By recording and analyzing the three-dimensional motion of astronauts, this study should help engineers apply ergonomics into future spacecraft designs and determine the effects of weightlessness on breathing mechanisms for long-duration missions.]*

The Russian flight engineer worked a number of standard maintenance/service

tasks on Russian Segment (RS) systems from the voluntary “time permitting” suggestions list. Specifically, Yuri -

- Completed the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM *[regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers];*
- Ran the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder);
- Performed the daily monitoring, picture-taking and downloading on the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP), including recharging the water tank of the greenhouse as required;
- Conducted the periodic collection and logging of accumulated data of seven Bubble Dosimeter detectors of the “Matryoshka-R” radiation payload suite (RBO-3-2) installed at various exposure locations in the RS, using the special Bubble Dosimeter Reader *[the complex Matryoshka payload suite is designed for sophisticated radiation studies];*
- Performed a session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program, using the Japanese HDV (High Definition) video camera provided by SFP Charles Simonyi to shoot video of the Pyrenees, Mediterranean coastline, Sahara, the Nile river valley, Africa, the South-Eastern States of the USA including Cape Canaveral, Cuba, Jamaica, and Latin American countries with emphasis on the coastline; and
- Completed another KPT-3 session to make observations and take aerial KPT-3 photography of environmental conditions for Russia's Environmental Safety Agency (ECON) using the Nikon D2X digital camera with SIGMA 300-800mm telephoto lens.

New task items added to the discretionary U.S. “job jar” task list for Peggy and Leo pertain to two audits – of onboard CTBs (Cargo Transfer Bags), and of the “stowage rack of the week” on the Lab -- using a new Audit function introduced last year on Increment 15 with the implementation of the laptop-based IMS 2.0 version. *[This function allows the user to setup audits of bags, kits, stowage locations, just about anything that is considered a container, via a special Audit window with a linked Object Properties window.]*

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED resistive exercise device

(CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Peggy transferred the crew's exercise data file to the MEC (Medical Equipment Computer) laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~9:00am, the crewmembers held their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP/Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

Weekly Science Update (Expedition Sixteen -- Week 20)

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Radiation measurements continue to be performed in the PIRS module. Radiation measurements continue to be performed in the PIRS module. The latest memory card exchange occurred on 2/29.

ANITA: Completed.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): In progress.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): In progress.

EuTEF (European Technology Exposure Facility): On 3/3 EuTEF was successfully rebooted and DHPU troubleshooting was successfully. Look-ahead plan for EUTEF science program week from 3/5 to 3/11: DOSTEL Mode 1 continuous, EXPOSE ON, DEBIE-2 ON, TRIBOLAB Stand-By mode, FIPEX activation of sensors, MEDET re-activation for continuous measurements, PLEGPAY experiment 2 run.

Fluid Science Laboratory (FSL): The FSL Facility commissioning is on hold pending restoration of a LAN (Local Area Network) cable connection.

GEOFLOW: GEOFLOW start is pending FSL LAN cable troubleshooting. "Thanks Leo for the help with the video images of FSL!"

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): In progress.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Complete.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 "Pirs".

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION/REPOSITORY: In progress.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems):

Ongoing.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): "Peggy, we have added the next download activity to be on your task list next week. The Actiwatch will stop taking data on 3/19 if not re-initialized. Thanks for your extra sleep logging."

SOLAR (Solar Monitoring Observatory): On 3/4, the facility lost TM/TC control for the instruments at around 8:30am EST. Following power cycling of Feeder 1, control of the instruments' TM and TC was restored. On 3/5, during the transition to Pointing Mode, the SOLAR platform unexpectedly went into standby mode. Control of the platform was later restored, but SOVIM science acquisition activation was postponed. On 3/6, a second attempt to bring SOLAR platform back into pointing mode was also unsuccessful. Further troubleshooting is in work.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): In progress.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: In progress.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): After the start of the WAICO run on 2/28, all ECs (Experiment Containers) have been centrifuged at 1-g for 3 days to force the orientation of the plants to a preferential growth direction. On 3/2 after WAICO run start, all 8 ECs were tilted to their 45° position, and Rotor A was stopped to provide 0-g conditions for 4 EC's. Daily video dump is performed to assess the development pattern of the plant roots. Plant growth is nominal. The ECs show significant condensation. To achieve clearance of the EC windows by the end of the run, in order to allow for good high-resolution photos, relative humidity was decreased to 60% on 3/4 and daily BLB (BIOLAB) LSS Flushing is being performed. The end of the run is currently estimated for 3/10-11 based on plant growth. Since the BLB caution due to excessive O_2 concentration at the start of WAICO run, gas composition and pressure controls are not available, but there is no immediate science impact. O_2 sensors were switched back on 3/3 and show nominal values.

CEO (Crew Earth Observation): Through 3/6 the ground has received a total of 15,902 frames of ISS/CEO imagery for review and cataloging. "A cursory scan of imagery received this morning indicates you have acquired imagery of some of our

impact sites in both North America and Africa, promising imagery of Khartoum, Sudan, and dramatic views of what appears to be Tropical Cyclone Jockwe near Mozambique. There are probably more that we could not immediately recognize. Thanks for responding to our requests; we will provide more feedback on your imagery next week. Your recent striking image of a gigantic cumulonimbus cloud (possibly a super cell) over western equatorial Africa will be published in NASA/ GSFC's Earth Observatory website this weekend. Your high oblique view with the long lens makes an excellent visual of the 3-dimensional aspect of weather systems and their structure in our atmosphere. Nice job!"

CEO photo targets uplinked for today were **Hyderabad, India** *(the frequently turbid atmosphere over India often makes it difficult to spot city targets. ISS had a nadir pass near midday as it approached from the NW. Using the long lens settings to map the urban edges of this sprawling city of nearly 7 million people),* **Addis Ababa, Ethiopia** *(as ISS approached this target from the NW at midday, the crew was to look for the Ethiopian capital city to be just left of track. Using the long lens settings for a detailed mapping of urban edges, especially near the forest and agricultural areas),* and **Tropical Cyclone Jokwe** *(DYNAMIC EVENT: The Joint Typhoon Warning Center forecast track has Jokwe making a glancing landfall on the northeastern coast of Mozambique in the early afternoon as a Category 2 storm. This course placed the storm just left of ISS track. As the station approached the system from the NW, the crew was to try for broad, short lens views of the extent of the storm, and when near nadir, try for long lens views of details of the cloud structure. Prompt downlink of DYNAMIC EVENT imagery increases its value to the media and disaster responders)*.

CEO photography can be studied at this "Gateway" website:
http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:43am EST [= epoch]):*
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Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0001787
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Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 122 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53264

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*

03/08/08 -- ATV-1 “Jules Verne” launch/Ariane V (Kourou, French Guiana) (11:03:04pm EST); -- ***see below***
03/09/08 -- *Change of US Standard Time to Daylight Saving Time (at 2:00am)*
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS (JLP) – 2:28am EDT, for a record 16+1+2 mission duration, incl. 5 EVAs;
03/12/08 -- ATV CAM (Collision Avoidance Maneuver) demo (3:59:28am EDT)
03/12/08 -- STS-123/Endeavour/1J/A docking – ~11:27pm EDT
03/19/08 -- ATV1 parking orbit (loiter) arrival (8:00am EDT)
03/24/08 -- STS-123/Endeavour/1J/A undocking -- ~7:55pm
03/26/08 -- STS-123/Endeavour/1J/A deorbit – ~7:33pm; landing (KSC) -- ~8:35pm.
03/27/08 – ATV1 end of loiter; leave parking orbit
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
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05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
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09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)

12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

ATV "Jules Verne" Ascent Timeline

HH:MM: SS	***Critical events***
-05:30:00 (5:33pm EST)	** ATV Ground Segment launch readiness status (GO/NO-GO) to the ATV Launch Mission Manager ** Readiness to the ATV-CC, international partners and network ** Before start of Ariane 5 EPC*/main stage fuelling
-02:00:00	** Final ATV data exchange between ATV-CC and Kourou ** Loading of ATV latest software data in the ATV

-00:10:00	Final ATV Ground Segment Launch readiness GO status
-00:08:00	ATV in launch configuration, power autonomous
-00:07:00	Start of Ariane 5 automatic sequence
-00:00:03	Ariane 5 inertial platform release
---	---
11:03 EST	Main engine start - Ariane 5 Vulcain engine/ EPC ignition
---	---
+00:00:07	Solid boosters (EAP*) ignition and lift-off
+00:02:18	Solid boosters (EAP) separation - 138 seconds
+00:03:29	Fairing jettisoned - 209 seconds
+00:09:08	First stage (EPC)/upper stage (EPS) separation
+00:09:08	Upper stage (EPS*) engine ignition - 8 minutes

*)*EPC = Etage Principal Cryotecnique/ Cryogenic main stage*
EPS = Etage a Propergols Stockable/ Storable propellant stage (upper stage)
EAP = Etage d'Acceleration a Poudre/ Solid rocket boosters

Note: The daily ISS On-Orbit Status reports can also be found at http://www.hq.nasa.gov/osf/iss_reports/index.htm

+00:17:15	** Ariane 5 end of EPS 1st thrust ** Beginning of ballistic phase - 45 minutes
---	---
+01:02:10	Ariane 5 beginning of EPS second thrust
+01:02:42	** Ariane 5 end of EPS second thrust: orbit injection ** Start of Ariane 5 SCA phase ** Start of ATV telemetry ** Initialization of the ATV propulsion system ** Check of ATV status by ATV-CC
+01:06:41	Separation of ATV from upper stage
---	---
+01:31:41	Autonomous ATV navigation control from star-trackers sensor inputs

+01:36:41	** Solar array deployment (automatic) ** Maximum duration - 10 minutes (nominal 330 seconds)
+03:06:41 (2:10am EST)	(Approx. time) Deployment of the Proximity Link boom, necessary for final approach to ISS
+06:06:41 (5:10am EST)	(Approx. time) End of Launch and Early Operations Phase (LEOP)

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/07/08
Date:	Friday, March 07, 2008 1:40:41 PM
Attachments:	

ISS On-Orbit Status 03/07/08

All ISS systems continue to function nominally, except those noted previously or below.

Upon wake-up, FE-1 Yuri Malenchenko terminated his MBI-12 SONOKARD experiment session (his 11th), started last night, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

Before breakfast, CDR Whitson, FE-1 Malenchenko and FE-2 Eyharts began their workday with the periodic session of the Russian biomedical routine assessments PZEh-MO-7/Calf Volume Measurement and PZEh-MO-8/Body Mass Measurement (fifth for CDR & FE-1, second for FE-2), using the IM mass measurement device which Yuri Malenchenko afterwards broke down for stowage. *[Calf measurements (left leg only) are taken with the IZOG device, a custom-sewn fabric cuff that fits over the calf, using the knee and lower foot as fixed reference pints, to provide a rough index of deconditioning in zero-G and effectiveness of countermeasures. For determining body mass in zero-G, where things are weightless but not massless, the Russian IM "scales" measure the inertial forces that arise during the oscillatory motion of a mass driven by two helical metering springs with known spring constants. By measuring the time period of each oscillation of the unknown mass (the crewmember) and comparing it to the period of a known mass, the crewmember's mass is calculated by the computer and displayed.]*

Whitson supported the second session of the ELITE-S2 (Elaboratore Immagini Televisive - Space 2) payload by Eyharts by detaching the CEVIS (Cycle Ergometer with Vibration Isolation) from the ER3 (EXPRESS Rack 3) and moving it out of the field of view of the cameras crucial to of the experiment, which she then set up for capturing Leo's movement protocol. After powering up the IMU (Interface Management Unit) and calibrating the work area for the cameras, the FE-2 had ~1.5 hrs to perform the test operations while Whitson took documentary photographs and later stowed the test camera. *[The Italian (ASI) experiment ELITE-S2 is a human motion analysis facility for technological characterization and potential application for multifactorial movement analysis, to study the connection between brain, visualization and motion in micro-G. By recording and analyzing the three-dimensional motion of astronauts, this study should help engineers apply ergonomics into future spacecraft designs and determine the effects of weightlessness on breathing mechanisms for long-duration missions. For each of three protocols (e.g., MOVE, IMAGINE), a set of body landmarks are identified and reflective markers are applied on the subject who then performs prescheduled movements with the index finger tips then returns to the initial position (for example, the subject has to reach and brush, without exerting forces). The video cameras trace the trajectories of the body parts of the astronaut catching the light reflected by the markers, thus recording the kinetic and trajectory data of the movement.]*

Continuing his work on the FSL (Fluid Science Laboratory) in the Columbus module, the French flight engineer was scheduled to install the "ERNObox" structure for the FSL A31p laptop on the rack's starboard panel and established A31p power supply via SUP1 (Standard Utility Panel #1) and data connection via the UIP (Utility Interface Panel).

FE-1 Malenchenko meanwhile performed the monthly 30-min. maintenance/ servicing of the toilet facility (ASU), changing out replaceable ASU parts with new components, i.e., the urine receptacle (MP) and a filter insert (F-V). The old parts were discarded as trash.

After reviewing 400 & 800mm-lens "refresher" imagery taken during the STS-122/1E Atlantis RPM (R-bar Pitch Maneuver) on 2/9, Whitson and Malenchenko conducted another regular 30-min in-cabin RPM imaging skill training, Peggy's sixth, Yuri's seventh, using DCS-760 digital still cameras to take photos of an Orbiter cut-out for practice. The photos were later downlinked for ground analysis.
[The skill training prepares crewmembers for the bottomside mapping of the Orbiter at the arrival of STS-123/1J/A next week (3/13). During the RPM at ~600 ft from the station, the ISS crew will have only ~90 seconds for taking high-resolution digital photographs of all tile areas and door seals on the Atlantis from SM windows 6 & 8, to be downlinked for launch debris assessment. Thus, time available for the

shooting will be very limited, requiring great coordination between the two headset-equipped photographers and the Shuttle.]

Afterwards, Peggy checked the DCS-760 cameras for detail & color fidelity by taking blank and white images to “clean” and calibrate the CCDs (Charge-Coupled Devices). The test photos were stored on a 1GB Microdrive PCMCIA (Portable Computer Memory Card International Adapter) and downlinked to MCC-Houston for determining which cameras will be used for the actual RPM activities before the Endeavour docking.

In the US Lab, FE-2 Eyharts set up the hardware associated with urine and blood collections for his second session of NASA’s NUTRITION/Repository experiment, scheduled on his timeline tomorrow. *[The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

Continuing the current round of periodic preventive maintenance of RS (Russian Segment) ventilation systems, Yuri spent 90 min. in the DC1 (Docking Compartment), replacing the PF1,2 filter cartridges and cleaning the V1 & V2 fan grilles and VD1 & VD2 air ducts.

The Russian flight engineer also worked a number of standard maintenance/service tasks on RS systems, some from the voluntary “time permitting” task list. Specifically, Yuri -

- Completed the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers];*
- Conducted the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur);
- Ran the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder), and
- Performed the daily monitoring, picture-taking and downloading on the BIO-5

Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP), today also recharging the water tank of the greenhouse as required.

Whitson and Eyharts spent an hour reviewing uplinked material on 1J/A EVA tasks, then conducted a 30-min teleconference with ground specialists to discuss the spacewalks. *[Planned are five EVAs during the 1J/A docked period,- on FD4 (Linnehan & Reisman), FD6 (Linnehan & Foreman), FD8 (Linnehan & Behnken), FD11 (Foreman & Behnken), and FD13 (Foreman & Behnken). Major objectives are as follows:*

- *EVA-1: Prep & install JLP (Japanese Experiment Logistics Module – Pressurized Section) on Node-2; begin assembly of SPDM (Special Purpose Dexterous Manipulator, "Dextre");*
- *EVA-2: Assembly & activate SPDM;*
- *EVA-3: Assemble SPDM; transfer SSRMS yaw joint plus two DCSUs (Direct Current Switching Units) to ESP-2 (External Stowage Platform 2); transfer MISSE-6 (Materials ISS Experiment 6) to Columbus;*
- *EVA-4: Replace RPCM (Remote Power Controller Module); conduct TRAD (Tile Repair Ablator Dispenser) demo;*
- *EVA-5: Stow OBSS (Orbiter Boom Sensor System) on ISS S1 truss, install JLP trunnion covers, install TBA (Trundle Bearing Assembly) in starboard SARJ (Solar Alpha Rotary Joint.*

"Critical path" tasks include - on EVA-1: OTCM (ORU Tool Changeout Mechanism) installation; on EVA-2: SPDM arms assembly; on EVA-3: SPDM OTP (ORU Temporary Platform)/THA (Tool Holder Assembly), SLP (Integrated Spacelab Pallet) prep for landing, MISSE 6 & ORU transfers; on EVA-4: Node-2 port ACBM (Active Common Berthing Mechanism) launch lock removal; and on EVA-5: OBSS stowage on ISS.
Also, after SPDM assembly, Dextre must be parked on the Lab PDGF (Power & Data Grapple Fixture) and the SLP must be returned to the Shuttle cargo bay.]

FE-1 Malenchenko had another hour for conducting stowage operations in Progress M-63/28P, transferring and packing cargo for disposal in the freighter-turned-trash can, to be undocked on 4/7 for destructive reentry over the Pacific.

New task items added to the discretionary U.S. "job jar" task list for Peggy and Leo pertain to two audits – of onboard CTBs (Cargo Transfer Bags), and of the "stowage rack of the week" on the Lab -- using a new Audit function introduced last year on Increment 15 with the implementation of the laptop-based IMS 2.0 version. *[This function allows the user to setup audits of bags, kits, stowage locations, just about anything that is considered a container, via a special Audit window with a linked Object Properties window.]*

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Peggy transferred the crew's exercise data file to the MEC (Medical Equipment Computer) laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~3:10am EST, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~3:25am, FE-2 Eyharts had a 15-min. teleconference with ESA Management via the IP Phone.

At ~7:55am, Leo and Peggy conducted the regular weekly 20-min. audio tagup with ESA's Col-CC (Columbus Control Center) in Oberpfaffenhofen near Munich/ Germany. *[S/G-2 (Space-to-Ground 2) phone patch via SSC-10 (Station Support Computer 10)]*.

At ~9:20am, Peggy, Yuri and Leo held their standard bi-weekly teleconference with the JSC Astronaut Office (Steve Lindsey), via S-band S/G-2 audio & phone patch.

At ~12:55pm, Yuri Malenchenko downlinked a phone message of greetings to TsUP-Moscow, congratulating the President of the Russian Tennis Federation, Shamil A. Tarpishchev, on an anniversary.

At ~2:51pm, the crew will have their 14th weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC-10 (Station Support Computer 10)]*.

CEO photo targets uplinked for today were **South Tibesti Megafans** *(a series of large fanlike spreads of sediment, hundreds of km long and wide, extend southward from the Tibesti Mountains into the Bodélé depression of central Chad. A discontinuous overlapping pattern of stream channels, large and small, suggests that the entire surface of the megafans was formed by the action of rivers shifting across the surface. Since about 8000 years ago, the Sahara environment has dried significantly, leaving non-functioning rivers channels everywhere. Images of areas south of Tibesti are only available in low resolution: therefore crew imagery--continuous mapping swaths taken with 400- and 800 mm lenses--are needed to*

provide the detail to reveal evidence of stream process and the intersection of streams on different fan surfaces. As ISS approached the Tibesti Mountains from the NW at midday, the crew was to shoot just right of track for these features), **Baltimore Ecosystem, Maryland** *(the Baltimore Ecosystem Study [BES] aims to understand metropolitan Baltimore as an ecological system. The program brings together researchers from the biological, physical, and social sciences to collect new data and synthesize existing information on how both the ecological and engineered systems of Baltimore work. As a part of the National Science Foundation's Long-Term Ecological Research [LTER] Network, researchers also seek to understand how Baltimore's ecosystems change over long time periods. ISS approach was from the NW in late morning. Looking right of track for the upper end of Chesapeake Bay and using the long lens settings to map the Baltimore urban area in detail),* and **Madrean Sky Islands** *(this target is located in the northern reaches of Mexico's Sierra Madre Occidental which boast some of the richest biodiversity anywhere in North America. It is a veritable archipelago of cool, moist, higher-altitude pine-oak forested mountain ranges that dot the hot, lower Sonoran and Chihuahuan deserts of southern Arizona and New Mexico and northwestern Mexico. These climatological islands are situated in remote and rugged areas and are vestiges of cooler, wetter periods during the ice ages. ISS approach was from the NW in early afternoon sun. Using the medium resolution lens for a nadir, contextual mapping strip across the heart of this region)*.

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10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation

05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/06/08
Date:	Thursday, March 06, 2008 3:06:34 PM
Attachments:	

ISS On-Orbit Status 03/06/08

All ISS systems continue to function nominally, except those noted previously or below.

FE-1 Malenchenko started his day with an IFM (In-flight Maintenance) in the FGB (Funktsionalnyi-Grusovoi Blok), removing and replacing a sensor component of the SIT-9L Temperature Measuring System in the BR-9TsU-8 Radiotelemetry System (RTS) with a new unit, discarding the old box.

CDR Whitson performed the periodic calibration of the two CSA-O_2 (Compound Specific Analyzer-Oxygen sensor) instruments #1041 & #1052, using a calibration tank with accurately known pressure. *[Partial Pressure Oxygen (ppO_2) readings were 21.4% before and 21.3% after calibration on #1041, 23,3%/21.3% on #1052.]*

Afterwards, Whitson took the periodic CO_2 (Carbon Dioxide) measurements in the cabin atmosphere with the CDMK (CO_2 Monitoring Kit, #1013). *[Measured levels were 0.45% in the Lab, 0.43% in the SM (Service Module), 0.44% in the COL (Columbus Orbital Laboratory). 0.45% = 4,500 ppm (parts per million).]*

Later, Peggy conducted the periodic verification of IMV (Intermodular Ventilation) airflow between U.S. and Russian segment modules by taking air flow measurements using the Velocicalc meter. *[There is no direct measurement of airflow except as reflected by, and calculated from, differences in atmosphere partial pressures measured at selected points between the RS and USOS. $ppCO_2$ is a good yardstick since for example an increasing $ppCO_2$ in the Lab not reflected in the SM would indicate that Vozdukh is not receiving the air from the Lab at an efficient rate. Periodic air flow degradation checks support establishing a most effective fan cleaning schedule.]*

The CDR and FE-2 conducted an in-depth review of the upcoming 1J/A MSS (Mobile Service System) task assignments, including the new DOUG (Dynamic Onboard Ubiquitous Graphics) setup and identification of SSRMS (Space Station Remote Manipulator System) targets.

Afterwards, Peggy and Leo were joined by Yuri for a review of the summary 1J/A timeline and the commensurate plan for the ISS crew.

Having received the uplink of ATV Onboard Trainer (AOT) software via U.S. assets (OCA) overnight, Malenchenko installed the sophisticated application on the Russian RSK1 laptop and performed a health test on it. *[The AOT software shows a simulated zoomable image of the orbital region of approach with a target zone and the ATV as it closes in on the ISS. For controlling manual approaches (should they be required), the AOT provides simulated control panel images for the ATV and for the SM Simvol-Ts television display, plus text displays for station clock time and approach parameters (distance, velocities, etc.), similar to the TORU OBT.]*

FE-2 Eyharts filled out the regular FFQ (Food Frequency Questionnaire), his third, on the MEC (Medical Equipment Computer). *[By means of these FFQs, NASA/ ESA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins.]*

The CDR conducted the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week. The current cue card (16-0018V) lists 35 CWCs (~1427.9 L total) for the four types of water identified on board: technical water (812.9 L, for Elektron, flushing, hygiene), potable water (559.6 L), condensate water (54.7 L), waste/EMU dump and other (07 L). Of the 35 containers, nine CWCs with technical water (388.9 L) cannot be used until cleared for* Wautersia *bacteria, and 10 CWCs with potable water (427 L), transferred from Atlantis, are not cleared for use pending analysis of samples returning on 1E.]*

The FE-1 completed the periodic monitoring, picture-taking and image/data downlinking on the BIO-5 Rasteniya-2 ("Plants-2") experiment. Today's task was extended to include recharging the water tank of the greenhouse. *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). During its operation, the experiment requires regular*

daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/ video recording. During the duration of the BIO-5 experiment, students of the Moscow City Palace for Youth Creativity of the Meshchansky inter-regional center #15 in Moscow) and the Prince of Oldenburg Lyceum in St. Petersburg will be cultivating plants in parallel on the ground and conducting comparative observation of plant growth and development under gravity and zero-gravity conditions. They are receiving the photo images taken by Yuri.],

In the U.S. Airlock, Whitson terminated the BSA (Battery Stowage Assembly) recharging of the second set of EMU (Extravehicular Mobility Unit) batteries, to be used in the forthcoming 1J/A spacewalks.

Peggy also conducted the periodic checkup on active U.S. payloads, i.e., cleaning the ANITA (Analyzing Interferometer for Ambient Air) inlet plus inspecting and filter cleaning of the CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) incubator payload. *[The CGBA incubator is controlled from the ground, with automatic video downlinked to Earth. ANITA continues to collect data every six seconds and downlinks the data daily to the ground team. ANITA monitors low levels of potential gaseous contaminants in the ISS cabin atmosphere with a capability of simultaneously monitoring 32 gaseous contaminants. The experiment is testing the accuracy and reliability of this technology as a potential next-generation atmosphere trace-gas monitoring system for ISS and future spacecraft. This is a cooperative investigation with ESA.]*

With both OGS (Oxygen Generation System) and the Elektron-VM O_2 generator currently off, cabin air refreshes with O_2 are being performed by Malenchenko from Progress 28P storage (SrPK) as required.

Eyharts performed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC from the Lab humidifier.]*

Malenchenko took care of the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

On the subject of the failed TVIS treadmill, CDR Whitson held a 30-min. teleconference to discuss her unsuccessful troubleshooting attempts with ground specialists. TVIS continues to be off limits for the crewmembers, and they are using other exercise equipment for their workouts. *[After undergoing its regular 6-month maintenance on 3/3, a TVIS Stabilization Fault (S3) appeared at the start of its first use, rendering the exercise device unusable for the crew since then. The fault persisted after Peggy went over the treadmill yesterday to check for lose connections and other potential causes. The ground team is developing a forward plan.]*

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1, FE-2).

Afterwards, Peggy transferred the crew's exercise data file to the MEC (Medical Equipment Computer) laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Leo Eyharts had another 30 min. reserved on his schedule for preparing end-of-increment/departure cleanup and prepacking.

At ~10:35am EST, Peggy and Yuri had a 15-min teleconference with ground specialists to discuss/critique the images downlinked from last month's (2/9) Shuttle RPM (R-bar Pitch Maneuver) during 1E/Atlantis final docking approach. *[The critique has the purpose to prepare the crew for the bottom side mapping of the Orbiter at the arrival of STS-123/1J/A. During the RPM at ~600 ft from the station, the ISS crew will have only ~90 seconds for taking high-resolution digital photographs of all tile areas and door seals on the Orbiter, to be downlinked for launch debris assessment. Thus, time available for the shooting will be very limited, requiring great coordination between the two headset-equipped photographers and the Endeavour CDR, Dom Gorie.]*

At ~11:25am, the CDR had a PAO TV interview with KTIV-TV in Sioux City, Iowa (Al Joens) of ~10 min, also shown on NASA TV.

At ~4:20pm, shortly before sleep time, Yuri will set up the Russian MBI-12 SONOKARD (Sonocard) payload and start his eleventh experiment session, using a sports shirt from the SONOKARD kit with a special device in the pocket for testing a new method for acquiring physiological data without using direct contact on the skin. Measurements are recorded on a data card for return to Earth. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data*

through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]

Working off his voluntary "time permitting" task list, the FE-1 also conducted the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder), and

COL Status: (1) FSL (Fluid Science Laboratory) troubleshooting by Eyharts and Col-CC (Columbus Control Center/Oberpfaffenhofen) has identified the cause of the facility's startup failure to be a cable harness disconnected from a connector. While Eyharts may be asked to try recrimping the connector to allow its plugging in, ground specialists are already at work to construct a replacement harness in time to be launched on 1J/A next week. (2) GEOFLOW cannot be started without the FSL being powered up first. (3) On 3/10 (Monday), the high-priority BIOLAB/WAICO greenhouse plant growth experiment is coming to an end of its two-week period. (4) Both external payloads, EuTEF (European Technology Exposure Facility) & SOLAR (Solar Monitoring Observatory), are running but have developed problems that are being worked. (5) Last night, Col-CC lost all communications with COL, remaining totally without comm until ~8:00am CET (Central European Time) this morning when the not-yet-understood problem was corrected.

CDRA Update: After the 3/1 IFM (In-Flight Maintenance) by Peggy Whitson on the Carbon Dioxide Removal Assembly, bypassing the erratic temperature sensor A of Bed 2 (#202) to restore CDRA to nominal operation, Bed 1 (#201) is now showing the same problem with erratic temperature readings. Work is underway to restore channel 1's function in a similar manner by 3/11, again including placing a PPL (Pre-Positioned Load) software mask on the erroneous temperature reading.

Russian Prop Transfer Repeat: Tonight, TsUP-Moscow will repeat the transfer of oxidizer (N_2O_4, nitrogen tetroxide) to the SM's BO2 tank which was stopped yesterday morning when an SM manifold thruster caution was received, waking the crew. Tonight's transfer is scheduled for Daily Orbits DO15/16/1/2 (5:00pm-10:10pm EST). No crew involvement required.

Russian Condensate Transfer: The experimental use of the NOK-1 condensate evacuation pump of the SKV-1 air conditioner for transferring U.S. condensate from a Russian EDV container to an SM Rodnik tank proved successful and can be used

in the future. However, RSC-E cannot confirm with telemetry that the tank is receiving water, and more time is needed to determine the exact quantity of water going into the empty Rodnik. Three EDVs which have not previously carried pre-treated urine will be made available to process U.S. condensate through 15S undock (mid April). Consequently, there's no need to dump excess water overboard.

OGS Deactivation: Final deactivation of the Oxygen Generation System by Whitson was successfully completed yesterday. The previous operation ended on 10/9/07. The requirement is to activate OGS every 90 days.

ATV Update: ESA has developed a detailed timeline for the Automated Transfer Vehicle, scheduled for launch on Saturday, 3/8, at 11:03:04pm EST, and has achieved agreement with RSC-Energia on manual docking procedures and a protocol, should they become necessary, with only one new procedure yet to be incorporated. More coordination work remains to be done for the unlikely case of ATV Undocking without functioning PCE (ProxOps Communications Equipment).

MSS Readiness: The required 1J/A Robotics checkouts are complete. The MT (Mobile Transporter) was moved successfully from WS4 (Worksite 4) to WS6 yesterday (12:40pm-2:40pm EST). The MSS (Mobile Service System) is ready for 1J/A docking.

CEO photo targets uplinked for today were **B.P. Structure** *(this very small impact feature is only 2 km in diameter and estimated to be less than 120 million years old. Because of this, it is a very challenging feature to spot and has yet to be identified in any astronaut photography of the region to date. ISS approach to the target area in eastern Libya was from the NW at midday, near nadir. Trying to locate and acquire this impact with the long lens settings for detail),* **Khartoum, Sudan** *(the Sudanese capital city is located at the confluence of the White and Blue Nile Rivers just north of an extensive agricultural area. ISS had a fine nadir pass at midday. Using the long lens settings and acquire detailed views of the edges of the urban area, especially along the banks of the rivers to the N, SE and S),* and **Tropical Cyclone Jokwe** *(DYNAMIC EVENT: This late-season tropical storm is currently located just off the northern tip of Madagascar. The Joint Typhoon Warning Center forecast call for further strengthening to a Category 1 or 2 storm as it continues west-southwestward into the Mozambique Channel. ISS pass was in early afternoon and by then the system should have been well left of track. Using the short lens settings for panning, oblique views of the extent and gross cloud structure of the storm)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the

Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:16am EST [= epoch]):*
Mean altitude -- 341.8 km
Apogee height -- 343.2 km
Perigee height -- 340.4 km
Period -- 91.37 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0002071
Solar Beta Angle -- -18.7 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 97 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53233

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
03/08/08 -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana) (11:03:04pm EST);
03/09/08 -- *Change of US Standard Time to Daylight Saving Time (at 2:00am)*
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS (JLP) – 2:28am EDT, for a record 16+1+2 mission duration, incl. 5 EVAs;
03/12/08 -- ATV CAM (Collision Avoidance Maneuver) demo (3:59:28am EDT)
03/12/08 -- STS-123/Endeavour/1J/A docking – ~11:27pm EDT
03/19/08 -- ATV1 parking orbit (loiter) arrival (8:00am EDT)
03/24/08 -- STS-123/Endeavour/1J/A undocking -- ~7:55pm
03/26/08 -- STS-123/Endeavour/1J/A deorbit – ~7:33pm; landing (KSC) -- ~8:35pm.
03/27/08 – ATV1 end of loiter; leave parking orbit
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking) ~10:39am EDT
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch - ~7:16am
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~8:43am
04/19/08 -- Soyuz TMA-11/15S undocking/landing (FGB nadir port)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)

09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
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05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
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4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

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http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/05/08
Date:	Wednesday, March 05, 2008 2:46:27 PM
Attachments:	

ISS On-Orbit Status 03/05/08

All ISS systems continue to function nominally, except those noted previously or below.

In the COL (Columbus Orbital Laboratory), FE-2 Leo Eyharts had an hour allotted to perform troubleshooting on a structural element which earlier (2/17) had prevented installation of a K-BAR (Knee-Brace Assembly Replacement) capture mechanism on the overhead F2 rack, as required for relocating of the MSG (Microgravity Science Glovebox) and EXPRESS Rack 3 (ER3). *[Today's troubleshooting dealt with repair and cleaning of a threaded hole on a standoff element for the right K-BAR capture fitting. The FE-2 used a vacuum cleaner to remove FOD (Foreign Object Debris) plus safety goggles, rubber gloves and a surgical mask for his protection.]*

Leo also continued COL commissioning, today unlocking (but not completely removing) the AVM (Anti-Vibration Mount) locking bolts of the module's ISFA (Intermodular Ventilation Supply Fan Assembly) and IRFA (Intermodular Ventilation Return Fan Assembly). *[The two fan assemblies are located at opposite sidewalls of the module, both behind cover panels.]*

Later, Eyharts assisted FE-1 Malenchenko in modifying (retrofitting) an air duct in the Service Module (SM) with an acoustic shield. *[With a joint crewtime of ~3 hrs allotted, work steps included establishing access to the air duct in the SM "ceiling" by removing a panel (#322), cutting the acoustic shield to size from a larger plate of the soft material with a hacksaw, installing the shield padding on panel 322, re-attaching the panel over the air duct and finally covering the acoustic shield with a piece of protective wire screen.]*

In the Lab, CDR Whitson meanwhile performed troubleshooting on ER3 (EXPRESS Rack 3) that earlier (2/25) was found to have a small leak (during demating) at the QD (Quick Disconnect) of the MTL (Moderate Temperature Loop) supply jumper hose between ER3 and the Z-panel. *[Troubleshooting steps included fully*

demating the hose, determining which side of the QD (Z-panel-side or jumper-side) had the problem if still present and, if so, examining the QD and cycling its movable parts if they are stuck. ER3 is slated to be transferred to the Columbus module as part of NASA's share in its utilization (~50%).]

In preparation for 1J/A EVA-5, Whitson had time set aside for taking torque measurements (with a Dial Torque Wrench) on three bolts of the spare TBA-5 (Trundle Bearing Assembly #5). *[Accurate running torque values are needed to determine final bolt torque settings for the fifth spacewalk, during which EV1 Bob Behnken and EV2 Mike Foreman will install the TBA in the starboard SARJ (Solar Alpha Rotary Joint).]*

After demating the BITS2-12 onboard telemetry measurement system in the SM from the BITS2-12 onboard transmitter (set #1, BP1A), FE-1 Malenchenko removed and replaced the BPA1 with a new unit brought up by Progress 28P. BITS2-12 was remated afterwards. *[The first inspection of the transmitter, located between panels 309 & 312, for possible malfunction was conducted by Yuri on 12/6/07.]*

The crew had an hour to review transfer and stowage plans for the 1J/A docked period, going through uplinked reference material (1J/A Transfer List, 1J/A Transfer Choreography, 1J/A Stowage Plan, and an overview of Stowage Requirements for the 1J/A Stage of Increment 16.). Afterwards, Peggy, Yuri and Leo held a 30-min. teleconference with ground specialists via S-band/audio to discuss transfer particulars.

In the Lab, Peggy Whitson closed down the OGS (Oxygen Generation System). *[This involved deactivating the WDS (Water Delivery System), turning off the OGS in its rack and demating the O_2 outlet QD, followed by purging the OGS H_2 (Hydrogen) sensor and re-installing the WGS on the OGS rack front.]*

With both OGS and the Elektron-VM O_2 (Oxygen) generator currently off, cabin air refreshes with O_2 are being performed by Malenchenko from Progress 28P storage (SrPK) as required.

Using the Russian IPD Draeger tube sampler (sensors 5C & 2A), Malenchenko checked for CO (Carbon Monoxide) in the SM.

Also in the Zvezda module, the FE-1 afterwards took readings of potentially harmful atmospheric contaminants with the CMS (Countermeasure System), part of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer suite, which uses preprogrammed microchips to measure H_2CO (Formaldehyde, methanal), CO and

NH_3 (Ammonia), taking one measurement per microchip;

Continuing preparations in the U.S. Airlock for the five 1J/A EVAs, Whitson first inspected APFR WIF (Articulated Portable Foot Restraint/Worksite Interface Fixture) adapters for sharp edges, to aid in the ongoing spacesuit glove cut incident investigation, then terminated the BSA (Battery Stowage Assembly) recharging of the first set of EMU (Extravehicular Mobility Unit) batteries and started recharge on the second set.

As part of the current round of periodic preventive maintenance of RS (Russian Segment) ventilation systems, Yuri spent 20 min. in the Soyuz TMA-11/15S at the FGB nadir port, cleaning the screen of its BVN fan/heater assembly.

Afterwards, the Russian flight engineer conducted the periodic (monthly) functional closure test of the Vozdukh CO_2 removal system's spare emergency vacuum valves (AVK), in the spare parts kit. *[The AVKs are critical because they close the Vozdukh's vacuum access lines in the event of a malfunction in the regular vacuum valves (BVK) or a depressurization in the Vozdukh valve panel (BOA). Access to vacuum is required to vent* CO_2 *during the regeneration of the absorbent cartridges (PP). During nominal operation, the AVK valves remain open.]*

To support ground-conducted troubleshooting of the TVIS treadmill, CDR Whitson today had a TVIS checkout activity added to her timeline. After undergoing its regular 6-month maintenance on 3/3, a TVIS Stabilization Fault (S3) appeared during its first use, rendering the exercise device off limits for the crew all day yesterday. *[If there was no recurrence of the stabilization fault during today's checkout, Peggy was to perform a speed characterization test and download the test data as part of the nominal exercise file. The crew was then Go for using the TVIS as planned. If not, the treadmill would remain off limits until further troubleshooting, and the crew would use the other exercise hardware.]*

The FE-1 completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC (Contingency Water Container) from the Lab humidifier.]*

Yuri also conducted the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston,

Moscow, Baikonur).

In addition, working off his voluntary “time permitting” task list, Yuri –

- Conducted the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder), and
- Performed the daily monitoring, picture-taking and downloading for the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP).

At ~4:45am EST, Leo Eyharts powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, and power supply), to conduct, at 4:50am, a ham radio exchange with students at the Lycée (Secondary School) de la Borde Basse in Castres, France. Questions to Leo were uplinked by ARISS (Amateur Radio on ISS) beforehand. *[“What type of schooling and higher studies did you complete to enable you to become an astronaut? How long did you study for it?”; “What is the typical duration for a mission on board the space station (minimum & maximum?)”; “Could you describe one of the experiments that you are to conduct in the Columbus laboratory?”; “How do you resolve cases of onboard personal conflict (arguments)?”; “Do you lose the notion of time on the ISS? Do you have the same sleeping patterns as when you are on Earth?”]*

At ~7:35am, the ISS crew convened for their weekly teleconference with ISS Program Management at JSC/Houston via Private S/G2, S-band/audio.

COL Anomalies: As reported here yesterday, the FSL (Fluid Science Laboratory) rack shut down shortly after start-up and remained powered-down. Troubleshooting by Col-CC (Columbus Control Center/Oberpfaffenhofen) was performed today after Eyharts installed a NASA videocamera in front of FSL and checked a UIP (Utility Interface Panel) connector. The EuTEF (European Technology Exposure Facility) payload’s Earth-viewing camera has failed to start up twice and is currently off. The SOLAR (Solar Monitoring Observatory) payload had a spontaneous reboot Monday (3/3) night and came back to nominal performance afterwards; Col-CC is assessing.

BCC Checkout Failure: Yesterday (3/3-3/4 overnight), ground teams initiated the standard two-hour checkout of BCC (Backup Control Center) swing and activation procedures that would be necessary in the event of a flight control transfer from Houston to the HSG (Houston Support Group) at TsUP-Moscow. The checkout failed when RGS-34 (Russian Groundsite 34) was unable to uplink a PPCP (PrePlanned Command Package) from MCC-Houston on DO3. For lack of time,

the backup pass uplink on DO5 was cancelled as well. HGS-M plans to re-perform the BCC Checkout at end-March. *[Purpose of the BCC Checkout is to demonstrate BCC functionality and provide proficiency training for HSR (Houston Support Room) personnel.]*

CEO photo targets uplinked for today were **Lahore, Pakistan** *(ISS had a nadir pass at midday over the Pakistan's second largest city of over 7 million people, approaching from the NW. As the station broke out of the mountains of Afghanistan, the crew was to look for this target on the northeastern part of the Indus River Plain, using the long lens settings and trying to map the urban margins),* **Mount Vesuvius** *(this famous stratovolcano is located on the west coast of Italy just east of the city of Naples. ISS pass was late morning southeastward down the Italian peninsula, and the crew was to aim just right of track for the bay of Naples and this isolated peak, using the long lens settings for details of the structure),* and **Madrean Sky Islands** *(this target is located in the northern reaches of Mexico's Sierra Madre Occidental which boast some of the richest biodiversity anywhere in North America. It is a veritable archipelago of cool, moist, higher-altitude pine-oak forested mountain ranges that dot the hot, lower Sonoran and Chihuahuan deserts of southern Arizona and New Mexico and northwestern Mexico. These climatological islands are situated in remote and rugged areas and are vestiges of cooler, wetter periods during the ice ages. On this midday pass from the NW, the crew was to use the short lens for a nadir, contextual mapping strip across the heart of this region)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 7:48am EST [= epoch]):*
Mean altitude -- 341.9 km
Apogee height -- 343.1 km
Perigee height -- 340.7 km
Period -- 91.37 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0001789
Solar Beta Angle -- -23.7 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 101 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53217

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
03/08/08 -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana) (11:04pm EST);

03/09/08 -- *Change of US Standard Time to Daylight Saving Time (at 2:00am)*
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS (JLP) – 2:28am EDT, for a record 16+1+2 mission duration, incl. 5 EVAs;
03/12/08??-- ATV CAM (Collision Avoidance Maneuver) demo
03/12/08 -- STS-123/Endeavour/1J/A docking – ~11:27pm EDT
03/18/08?? -- ATV1 parking orbit (loiter)
03/24/08 -- STS-123/Endeavour/1J/A undocking -- ~7:55pm
03/26/08 -- STS-123/Endeavour/1J/A deorbit – ~7:33pm; landing (KSC) -- ~8:35pm.
03/29/08?? -- ATV1 Demo Day 1
03/31/08?? -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch - ~7:16am
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~8:43am
04/19/08 -- Soyuz TMA-11/15S undocking/landing (FGB nadir port)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD

2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/04/08
Date:	Tuesday, March 04, 2008 1:46:26 PM
Attachments:	

ISS On-Orbit Status 03/04/08

All ISS systems continue to function nominally, except those noted previously or below.

Using the currently nonfunctional SKV-1 air conditioner setup, FE-1 Malenchenko worked with a wrench to hook up hoses and adapters, to connect it with an EDV container with U.S. Lab condensate water, then started its condensate evacuation pump (NOK-1) via laptop for transferring the condensate over to the SRV-K2M Condensate Water Processor, to prepare it for electrolysis in the Elektron oxygen generator. *[SKV-2 meanwhile continues to operate. The activities were monitored by TsUP-Moscow.]*

CDR Whitson continued her work with the InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) experiment in the MSG (Microgravity Science Glovebox), conducting two more runs (#41 & #42) to complete the test series for the low frequencies at different current levels for the MR (magnetorheological) fluid, exchanging video tapes after each run, then removing the vial assembly and finally powering the MSG down. *[InSPACE, which is non-automated and has no ground-commanding capabilities (except for the MSG video drawer), obtains basic data on MR fluids, i.e., a new class of "smart materials" that can be used to improve or develop new brake systems, seat suspensions robotics, clutches, airplane landing gear, engine mounts, and vibration damper systems (e.g., the Dong Ting Lake Bridge in China is equipped with MR motion dampers to counteract gusts of wind). The colloidal (dispersed) particles are contained in Helmholtz coils (CAs/Coil Assemblies) in the MSG that subject them to electric fields at certain strength and frequencies. The desired strong dipolar interaction between the small colloidal particles can be achieved in micro-G simply with an external magnetic field being turned on and off. On the ground, the flow properties (rheology) of many materials, especially those making up consumer products like detergents, fabric softeners, toothpaste and paints, are similarly controlled, though not by magnetic fields but by adding a polymer. It now appears, for example, that*

new formulations of fabric softeners may perform better in space than on earth.]

Peggy Whitson and Leo Eyharts completed the regular prelaunch checkout of the Robotics complex (for which they had prepared themselves on 2/29), taking the MSS/SSRMS (Mobile Service System/Space Station Remote Manipulator System) through a series of joint-and-end effector maneuvers. *[Steps of the checkout included grappling the MBS PDGF-3 (Mobile Base System Power & Data Grapple Fixture 3), grappling & ungrappling the Node-2 PDGF, then moving the robotarm to the 1J/A start position and finally performing a checkout of the Cupola & Lab RWS (Robotics Workstations).]*

FE-1 Malenchenko performed the periodic checkout/verification of IP-1 airflow sensors in the various RS (Russian segment) hatch openings (8) in the Service Module (SM), FGB and DC1 (Docking Compartment).

Afterwards, the FE-1 conducted the periodic/long-term inspection of the pressure hull in the DC1, taking detailed digital NIKON D2X photographs of portions of the shell behind service panel 301 to check for the presence of contamination, atmospheric condensate, micro-flora and corrosion. *[Any contamination was to be cleaned off with napkins, and the best quality photos were to be downlinked later via OCA.]*

Whitson worked in the U.S. Airlock in preparation for the five 1J/A EVAs, first starting the recharge process on EMU (Extravehicular Mobility Unit) batteries in the BSA (Battery Stowage Assembly), then checking out three PGTs (Pistol Grip Tools) and two SAFER (Simplified Aid for EVA Rescue) units. *[The PGT batteries used for the checkout are to be recharged tomorrow. The two checked-out SAFERs are #1006 & #1007.]*

Peggy also conducted the periodic (every two weeks) inspection of the RED (Resistive Exercise Device) canister bolts for re-tightening if required, followed by the monthly inspection of canister cords and RED accessories.

Yuri had two hours set aside for the periodic RS (Russian Segment) window inspection & photography, today in the SM and DC1, using a tool kit with ruler, adhesive tape, 90-deg equilateral triangle & measuring tape, the NIKON D2 X digital camera with 28-70 mm lens, a flash attachment, and sketches of the windows under scrutiny (#2 & #13 in SM, plus window VL1 in DC1) with previous detected flaws marked and flaw tables. *[Purpose of the activity is to assess the condition of the window panes for deterioration as compared to the data from previous increments (appearance of new cavities, scratches, discolorations, or spots reducing transparency, or an increase in the size of old flaws), plus photography. Then images and data tables were stored on the RSK1 laptop for*

subsequent downlink via OCA.]

Malenchenko later switched the Regul Packet communications channel from Regul Set 1 to Set 2 to support tonight's ground-commanded propellant transfer activities. *[Regul provides for two-way voice communication, digital command/ program information as well as telemetry transmission via RGS (Russian Groundsites). It also has the capability to receive and transmit range, radial velocity, and time-referenced information. It is the nominal uplink path for all Russian commands and is the only subsystem that operates using the Command Radio Link (KRL). Operating at a low data rate, it is equivalent to the U.S. S-band system. There is no Russian equivalent of the U.S. high data rate Ku-band system, based on the TDRS satellites.]*

The FE-1 completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC (Contingency Water Container) from the Lab humidifier.]*

Yuri also conducted the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

In addition, working off his voluntary "time permitting" task list, Malenchenko conducted the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder), and

FE-2 Eyharts again had an hour reserved on his schedule for preparing end-of-increment/departure cleanup and prepacking.

In the SM, Leo set up the video equipment for filming his subsequent workout on the TVIS (Treadmill with Vibration Isolation & Stabilization) for biomechanical evaluation of his performance and assessment of the hardware status by ground engineers. *[He is scheduled for a similar video-recorded workout on the RED tomorrow. Peggy's and Yuri's exercise videos were filmed earlier in the Increment.]*

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS

cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Peggy transferred the crew's exercise data file to the MEC (Medical Equipment Computer) laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

The crewmembers had their standard periodic PMC (Private Medical Conference) via S- & Ku-band audio/video.

At ~10:40am EST (4:40pm in France), Leo Eyharts supported two live PAO TV downlinks for ESA, one with France 2 Public Television (Laurent Delahousse) for ~6 min., the other with the Cite de l'Espace Space Museum in Toulouse (former ESA astronaut and current French minister Claudie Haigneré & Museum Director Jean-Luc Modenc with several students) for ~14 min.

At ~3:15pm, the crew will have their 13th weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC-10 (Station Support Computer 10)]*.

FSL Anomalies: After Leo Eyharts successfully completed yesterday's FSL (Fluid Science Laboratory) activities in the Columbus moduke and Col-CC/ Oberpfaffenhofen established TCS (Thermal Control System) flow to the rack, it was observed that the mass flow rate into the rack was 6 kg/hrs less than the nominal flow rate. Additionally, when Col-CC powered up the rack auxiliary power, no power draw was evident. When ground controllers re-attempted commanding the FSL rack to ON, a short current draw was observed which then returned to zero. FSL was powered off last night, and ground teams went to work determining a forward plan.

Russian Prop Transfer: After last night's transfer of fuel (UDMH, unsymmetrical dimethyl hydrazine) from Progress M-63/28P's refueling tanks to the SM's ODU (Integrated Propulsion System) BG2 tank, TsUP-Moscow is scheduled tonight to perform transfer of oxidizer (N_2O_4, nitrogen tetroxide) to the SM's BO2 tank during Daily Orbits DO15/16/1/2 (5:50pm-11:00pm EST), pumping out N_2 (nitrogen) using the K2 compressor. No crew involvement required.

Weekend Voluntary Science: Three optional activities for the voluntary "Saturday Science" program for next weekend (3/8-3/9) were suggested to Peggy for her choice. Selection is required by tonight. *[The choices are: (1) SWAB (Surface, Water and Air Biocharacterization) collections of air & surface samples; (2)*

InSPACE-2 – three experiment runs; and (3) EPO – Careers Demo (Identify all the different steps crewmembers have taken to get to where they are today; identify all the different NASA careers that work together to prepare an astronaut for spaceflight (Objective: to motivate students to strive for a career in science, technology, engineering, and mathematics and to someday work for NASA).]

CEO photo targets uplinked for today were **Chaing Mai, Thailand** *(this sprawling metropolitan area is the economic and cultural center of northern Thailand. Because this target has not been successfully acquired in the past, the ground team requested short lens, contextual views of the region to help locate it in the future. The crew had an excellent nadir pass over this target in early afternoon sun. As ISS approached from the NW, the crew was to look for urban areas in the complex of ridges and valleys),* **Lake Eyre, Australia** *(this large, mostly dry lakebed is a landmark feature of south central Australia. Just below sea level, the drainage of about one-seventh of the continent centers here and the presence or lack of water is indicative of variation in precipitation patterns observed over the eastern half of the continent. On this mid-afternoon pass, shooting primarily nadir and left of track for contextual views of water drainage pattern),* and **Oasis Impact Crater** *(this feature in eastern Libya is about 18km in diameter. Unlike numerous other circular features in the Sahara desert, it is actually an impact site nearly 120 million years old. ISS approach was from the NW in early afternoon. With a near nadir pass, trying for long lens views with great detail)*.

CEO photography can be studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

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Apogee height -- 343.5 km
Perigee height -- 340.5 km
Period -- 91.37 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0002241
Solar Beta Angle -- -28.5 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 116 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53201

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
03/08/08 -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana) (11:04pm EST);
03/09/08 -- *Change of US Standard Time to Daylight Saving Time (at 2:00am)*

03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS (JLP) – 2:28am EDT, for a record 16+1+2 mission duration, incl. 5 EVAs;
03/12/08??-- ATV CAM (Collision Avoidance Maneuver) demo
03/12/08 -- STS-123/Endeavour/1J/A docking – ~11:27pm EDT
03/18/08?? -- ATV1 parking orbit (loiter)
03/24/08 -- STS-123/Endeavour/1J/A undocking -- ~7:55pm
03/26/08 -- STS-123/Endeavour/1J/A deorbit – ~7:33pm; landing (KSC) -- ~8:35pm.
03/29/08?? -- ATV1 Demo Day 1
03/31/08?? -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch - ~7:16am
04/10/08 -- Soyuz TMA-12/16S docking (DC1) - ~8:43am
04/19/08 -- Soyuz TMA-11/15S undocking/landing (FGB nadir port)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation

05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/03/08
Date:	Monday, March 03, 2008 2:10:20 PM
Attachments:	

ISS On-Orbit Status 03/03/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 20 of Increment 16.*

FE-1 Malenchenko updated software on the Russian RS1 laptop HDD (Hard Disk Drive). *[After first connecting the A31p to the AGAT external monitor (temporarily disconnected from TP2 laptop), the FE-1 "ghosted" (cloned) its HDD with Vers. 07.05 file structure from a DVD, then updated the RS1 HDD new software from an USB memory stick, and created a copy of the load.]*

Afterwards, Malenchenko conducted the periodic/long-term inspection of the pressure hull in the Service Module Working Compartment (SM RO), looking for any moisture, deposits, mold, corrosion and pitting behind panels 107, 109, 130, 134, 135, 138, 139, 452, also underneath the TVIS treadmill (where deposit was discovered earlier) and the cold plates (where SNT and STR lines are installed). *[The inspection of the hull surface, which is coated with a primer and dark-green enamel, is done using cleaning napkins to wipe the area in question if required and reporting results to the ground. The hull inspection looks for changed color and cavities; if cavities are found, they are to be measured for depth after cleaning. Digital photographs of the shell before and after the removal of deposits will be made for documentation.]*

In the COL (Columbus Orbital Laboratory), FE-2 Eyharts activated the FSL ISPR (Fluid Science Laboratory/International Standard Payload Rack) for operation. *[Activation was preceded by installation of gap closures to protect against inadvertent access to the free spaces in the FCE (Facility Core Element) drawer structure, and installation of a video bypass to allow correct VMU (Video Management Unit) function without installed EC (Experiment Container). Activation also included verification of functionality of the rack's fire indicator system.]*

Whitson and Eyharts performed the major 6-month IFM (In-flight Maintenance) job

on the TVIS (Treadmill with Vibration Isolation & Stabilization), first checking its operation, then turning its 20 amp power circuit breaker off and completing the required parts replacements after allowing it to cool down for about one hour. *[The initial ops check consisted of Peggy listening to the roller noise and watching the belt movement with the belt running unmanned at ~10 mph, to compare it later to the speed characterization test at the end of the IFM. Afterwards, the CDR performed the 6-month maintenance, inspecting the roller bearings and replacing such parts as TVIS retainer plate fasteners, clamp rope assembly screw and gyroscope wire ropes.]*

The CDR also relocated the IVCPDS/TEPC (Intravehicular Charged Particle Directional Spectrometer/Tissue Equivalent Proportional Counter), the primary radiation measurement tool in the ISS, from the SM to the COL. *[TEPC was installed on the COL1A3 panel and plugged in at the J01 outlet on the COL1AD1 panel. Dan Tani had relocated TEPC to the SM (panel 410) on 1/23/08 after it had been running in Node-2 since 12/24/07.]*

Yuri Malenchenko continued his test program with the new KPT-2 BAR-RM payload equipment begun on 2/13, today taking more measurements with the AU-1 ultrasound analyzer in the FGB and later downlinking the data via BSR-TM channel. The data are being used for experimenting with ISS leak detection. *[BAR-RM is designed to develop a procedure for detection of air leakage from ISS modules based on environmental data anomalies (temperature, humidity, ultrasound emissions) at possible leak locations. The payload, controlled from the RSK1 laptop, uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/thermometer (TTM-2), an ultrasound analyzer (AU-01), and a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station. Measurements are taken in specific zones (13 in SM PkhO and 4 in DC1), both with lights & fans turned on and off.]*

Leo Eyharts had ~20 min set aside for taking situational video/photography of the Columbus module at its current status, for historic documentation.

Whitson undertook the monthly FDS PEP (Fire Detection & Suppression/Portable Emergency Provisions) safety inspection/audit. *[The IMS (Inventory Management System)-supported inspection involves verification that PFEs (portable fire extinguishers), PBAs (portable breathing apparatus), QDMAs (quick-don mask assemblies) and EHTKs (extension hose/tee kits) are free of damage to ensure their functionality, and to track shelf life/life cycles on the hardware (QDMA harness inspection was not required this time). In the USOS, there are a total of 5 PFEs and 7 PBAs, plus 7 QDMAs and 4 EHTKs.]*

FE-1 Malenchenko completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U urine container, replacement of the KOV EDV for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC (Contingency Water Container) from the Lab humidifier.]*

The FE-1 also conducted the daily IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/ import to its three databases on the ground (Houston, Moscow, Baikonur).

In addition, working off his voluntary "time permitting" task list, Yuri –

- Conducted the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder), and
- Performed the daily monitoring, picture-taking and downloading for the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP).

FE-2 Eyharts had an hour reserved on his regular schedule for preparing end-of-increment/departure cleanup and prepacking.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-2), RED resistive exercise device (CDR, FE-1, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Peggy then transferred the crew's exercise data file to the MEC (Medical Equipment Computer) laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Russian Prop Transfer: Tonight during Daily Orbits DO14/15/1/2 (~5:30pm-10:35pm EST), TsUP/Moscow will be transferring propellants from the Progress M-63/28P cargo ship's BG1,2 refueling tanks to the SM's ODU (Integrated Propulsion System) BG2 tank, while pumping out N_2 using the K2 compressor. No crew involvement required.

RPC Trip Update: RPC-3 (Remote Power Controller 3) which tripped on 2/24 in

RPCM (RPC Module) LA2B_G, was successfully closed on 2/29, as reported, followed by successful commanding of the MTL RFCA (Moderate Temperature Loop Rack Flow Control Assembly) valve in Node-1 to the correct flow position to support the US Airlock depress pump for the 1J/A EVAs. Early this morning, RPC-3 tripped again. No further troubleshooting is planned before Flight 1J/A..

U.S. Condensate Water Processing: Currently, Lab/CCAA (Common Cabin Air Assembly) condensate cannot be processed in the RS (Russian Segment), and teams are considering a water dump for lack of sufficient CWC (Contingency Water Container) stowage room. However, RSC-Energia will try a new process tomorrow of using the SKV condensate pump to transfer US water which could then be processed in the RS (for Elektron).

OGS Performance: The U.S. Oxygen Generation System continues to run nominally since activation on 2/28; it will be deactivated on 2/5 (Wednesday).

RSK1 Laptop Failure Update: After the recent unsuccessful attempts by Yuri to load the Russian RSK1 laptop with an ATV (Automated Transfer Vehicle) docking simulation application, RSC-Energia plans to uplink the CBT (Computer-based Training) package, modified for the previous software version 1.2, on 3/6 (Thursday) via U.S. OCA assets.

COL Condensate Processing: Troubleshooting is underway by ESA on hardware & procedures for processing COL condensate.

No CEO photo targets uplinked for today.

CEO photography can be viewed and studied at this “Gateway” website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,000 from the ISS alone).

ISS Orbit *(as of this morning, 8:42am EST [= epoch]):*
Mean altitude -- 342.1 km
Apogee height -- 343.7 km
Perigee height -- 340.4 km
Period -- 91.38 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0002442
Solar Beta Angle -- -33.3 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 137 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53186

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
03/08/08 -- ATV-1 “Jules Verne” launch/Ariane V (Kourou, French Guyana) (~10:59pm EST);
03/09/08 -- *Change of US Standard Time to Daylight Saving Time (at 2:00am)*
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS (JLP) – 2:28am EDT, for a record 16+1+2 mission duration, incl. 5 EVAs;
03/12/08??-- ATV CAM (Collision Avoidance Maneuver) demo
03/12/08 -- STS-123/Endeavour/1J/A docking – ~11:27pm EDT
03/18/08?? -- ATV1 parking orbit (loiter)
03/24/08 -- STS-123/Endeavour/1J/A undocking -- ~7:55pm
03/26/08 -- STS-123/Endeavour/1J/A deorbit – ~7:33pm; landing (KSC) -- ~8:35pm.
03/29/08?? -- ATV1 Demo Day 1
03/31/08?? -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking/landing (FGB nadir port)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment

12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/02/08
Date:	Sunday, March 02, 2008 1:39:22 PM
Attachments:	

ISS On-Orbit Status 03/02/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday -- off-duty day for CDR Whitson, FE-1 Malenchenko & FE-2 Eyharts. Ahead: Week 20 of Increment 16.*

For today's Voluntary Science program, Peggy Whitson continued her work with the InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) experiment in the MSG (Microgravity Science Glovebox), conducting another three runs (#38, #39 and #40) to investigate higher-frequency behavior (2 Hz for #38 & #39, 5Hz for #40) at different current levels for the MR (magnetorheological) fluid with no vial change, exchanging video tapes after each run, then removing the vial assembly and finally powering the MSG down. *[InSPACE obtains basic data on MR fluids, i.e., a new class of "smart materials" that can be used to improve or develop new brake systems, seat suspensions robotics, clutches, airplane landing gear, and vibration damper systems. The colloidal (dispersed) particles are contained in CAs (Coil Assemblies) in the MSG that subject them to electric fields at certain strength and frequencies. The desired strong dipolar interaction between the small colloidal particles can be achieved in micro-G simply with an external magnetic field being turned on and off. On the ground, the flow properties (rheology) of many materials, especially those making up consumer products like detergents, fabric softeners, toothpaste and paints, are similarly controlled, though not by magnetic fields but by adding a polymer. It now appears, for example, that new formulations of fabric softeners may perform better in space than on earth.]*

FE-1 Malenchenko completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including ASU toilet facilities systems/replaceables plus the weekly collection of the toilet flush counter (SPK-U) and water supply (SVO) readings for calldown to TsUP/ Moscow. *[Regular daily SOZh maintenance consists of replacement of the KTO & KBO solid waste containers, replacement of an EDV-SV waste water and EDV-U*

urine container, replacement of the KOV EDV for the Elektron-intended water, and processing U.S. condensate water as it becomes available in a filled CWC (Contingency Water Container) from the Lab humidifier. Weekly SOZh reports (on Sundays) to TsUP/Moscow deal with number & dates of water and urine containers, counter readings of water consumption & urine collection, plus data and total operating time of the Russian POTOK-150MK (150 micron) air filter unit of the SOGS air revitalization subsystem.]

After Houston flight controllers deactivated the CDRA (Carbon Dioxide Removal Assembly) early this morning (4:00am-9:00am EST) and cooling was no longer required, CDR Whitson disconnected the ITCS LTL QD (Internal Thermal Control System/Low Temperature Loop/Quick Disconnect) jumper to the CDRA rack (LAB1D6).

Working from the Russian voluntary “time permitting” task list, Yuri Malenchenko –

- Completed his eighth run of the Russian DZZ-2 "Diatomeya" ocean observations program *[using the NIKON F-5 digital still camera with 80-200 mm lens and the SONY PD-150P camcorder at medium zoom, Yuri focused on phytoplankton field blooming in early March in the sub-arctic front of the Atlantic and bioproductive processes intensifying at this time of year in the Indian Ocean due to restructuring of the monsoon circulation; also of interest were associated oceanic phenomena (cloud pattern, water surface dynamics) in the target areas, today in the Indian Ocean the Oman coastal area and the areas west of Australia, and in the Atlantic Ocean the Gulf of Saint Lawrence and the Western Sahara offshore area]*;
- Conducted the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder), and
- Performed the daily monitoring, picture-taking and downloading for the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP).

At ~3:45am, the FE-1 participated in today’s Presidential Election in the Russian Federation with a personal downlink at ~3:45am EST as a Crew Choice event via RGS (Russian Ground Site) VHF.

Eyharts and Whitson had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-10 laptop), Leo at ~10:45am EST, Peggy at ~12:12pm

The crewmembers completed their regular 2.5-hr. physical workout program (about

half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR) and VELO bike with bungee cord load trainer (FE-1, FE-2).

No CEO photo targets uplinked for today.

CEO photography can be viewed and studied at this "Gateway" website: http://eol.jsc.nasa.gov (as of 3/1/08, this database contained 757,605 views of the Earth from space, with 314,001 from the ISS alone).

ISS Orbit (as of this morning, 8:18am EST [= epoch]):
Mean altitude -- 342.2 km
Apogee height -- 343.9 km
Perigee height -- 340.6 km
Period -- 91.38 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0002485
Solar Beta Angle -- -38.0 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 155 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53170

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
03/08/08 -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana) (~11:05pm EST); ***NEW***
03/09/08 -- *Change of US Standard Time to Daylight Saving Time*
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS (JLP) – 2:28am EDT, 16+1+2
03/12/08 -- ATV CAM (Collision Avoidance Maneuver) demo
03/12/08 -- STS-123/Endeavour/1J/A docking – ~11:27pm EDT
03/18/08 -- ATV1 parking orbit (loiter)
03/24/08 -- STS-123/Endeavour/1J/A undocking -- ~7:55pm
03/26/08 -- STS-123/Endeavour/1J/A deorbit – ~7:33pm; landing (KSC) -- ~8:35pm.
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
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04/19/08 -- Soyuz TMA-11/15S undocking/landing (FGB nadir port)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch

05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 03/01/08
Date:	Saturday, March 01, 2008 3:10:37 PM
Attachments:	

ISS On-Orbit Status 03/01/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday -- off-duty day for CDR Whitson, FE-1 Malenchenko & FE-2 Eyharts except for housekeeping and voluntary work.*

The crew completed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the Service Module (SM) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the CDR's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

As part of the house cleaning, Malenchenko performed preventive maintenance cleaning on the FS5, FS6, FS9, VPkhO, VdPrK, VPrK & TsV2 fan grilles in the SM, DC1 Docking Module, and FGB (Funktsionalnyi-Grusovoi Blok).

Later, Peggy conducted the visual microbial (bacterial & fungal) “T+5 Day” analysis of surface samples which she collected on 2/25 with the SSK/MAS (Surface Sampling Kit/Microbial Air Sampler) at specific locations near air diffusers in the COL (Columbus Orbital Laboratory). *[The sampling analysis is performed once per month for the first three months, and once every three months thereafter. Bacterial and fungal air samples are taken at two locations in each module. The colony growth on the sampling slides is analyzed after five days of incubation in four Petri dishes. For onboard visual analysis of media slides from SSK (Surface Sampling Kit), MCDs (microbial capture devices) from WMK (Water Monitoring Kit), coliform detection bags from MWAK (Microbial Water Analysis Kit), and Petri dishes from the MAS kit, the crew has a procedure for visual inspection of samples for bacterial and fungal colony growths after appropriate incubation periods.]*

FE-2 Eyharts filled out the regular FFQ (Food Frequency Questionnaire), his second, on the MEC (Medical Equipment Computer). *[By means of these FFQs, NASA/ESA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins.]*

The CDR worked on the U.S. OGS (Oxygen Generation System), removing the PWR (Payload Water Reservoir after verifying that it was empty and replacing it with a full PWR (#2004), then reactivating the OPS WDS (Water Delivery System). *[The ground monitored the activity via S-band and returned the unit to "Process" after R&R completion. Like the Elektron, OGS produces O_2 from water by electrolysis, dumping the also generated H_2 (hydrogen) through venting.]*

Yuri Malenchenko worked a number of standard maintenance/service tasks on Russian Segment (RS) systems, specifically –

- Completing the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM *[regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers]*; and - working from the Russian voluntary "time permitting" task list -
- Conducting the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder);
- Performing the periodic collection & deletion of readings on the MOSFET (metal oxide semiconductor field-effect transistor) radiation sensor reader/ display of the RBO-3-2 Matryoshka-R antroph-amorphous (human torso) "phantoms" located inside the station for sophisticated radiation studies, collecting radiation measurements every 15 minutes around the clock;
- Completing a run with the Russian "Uragan" (hurricane) earth-imaging program, using the Nikon D2X digital camera with 800 mm focal length lens plus video footage using the SONY HVR-Z1J digital high-definition camcorder provided last year by VC12 (Visiting Crewmember #12) Charles Simonyi *[targets uplinked for today were fires in the Volga-Akhtubinsk alluvial plain, contamination in Caspian Sea waters, Aral Sea and dust storm (if present), video footage of the Pyrenees mountains (from DC1 window 2), video footage of Pyrenees mountains (Window 2 in DC1), Patagonia Glaciers and Icebergs in the Drake Passage]*; and
- Performing another KPT-3 session to make observations and take aerial

KPT-3 photography of environmental conditions for Russia's Environmental Safety Agency (ECON), using the Nikon D2X digital camera with SIGMA 300-800mm telephoto lens today to document water surface contamination in the Sevastopol port area.

A new item on the U.S. discretionary “job jar” task list for Peggy Whitson has her move the PCS (Portable Computer System) A31p laptop in the SM from the PCS-2 port to the PCS-1 port (since the latter remains powered in case the FGB fire safing response is initiated). *[Previously unable to support the higher electrical draw of the A31p, the port has meanwhile been upgraded and is ready to power the SM PCS.]*

A second new task in the “job jar” is for Leo Eyharts to start preparing end-of-increment/departure cleanup and prepacking.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1, FE-2).

Peggy then transferred the crew’s exercise data file to the MEC laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~5:55am EST, the crew downlinked a PAO TV message of greetings and congratulations to TsUP-Moscow for replay on March 13 at the 50th Anniversary of the liquid-fuel rocket engine manufacturing plant Proton-PM in Perm, builder of the engines for the Proton booster, headed by General Director Igor Alexandrovich Arbuzov. *[“Dear Igor Alexandrovich, dear Proton team members: On behalf of the International Space Station crew we wish happy 50th Anniversary to the special enterprise for manufacturing liquid fuels rocket engines. You are the only enterprise in the country that builds first-stage engines for the Proton booster, which are recognized today as the most reliable in the world. By using your engines we have built our space home – the International Space Station. The trademark of your facility rests on exemplary work ethic, teamwork, skilled technical team, its talent and professionalism. We are certain that your sense of responsibility, the warmth of your hands and hearts applied to your work will serve our country well for many years to come. We wish your whole team and veterans of the enterprise new achievements, good health, and prosperity. We are certain that the product manufactured in Perm region will always be reliable, powerful and in great demand in Russia.”]*

At ~7:15am, Yuri Malenchenko had his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-9 laptop).

At ~9:00am, the crewmembers held their regular WPC (Weekly Planning Conference) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP/Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

CDRA Update: After yesterday's IFM (In-Flight Maintenance) on the Carbon Dioxide Removal Assembly by Peggy Whitson, CDRA continues to operate nominally. *[CDRA Bed 2 (#202) temperature sensor A had recently shown erratic behavior and signs of degradation that reduced system functionality, causing the bed heaters to shut off during times when they should have heated the bed to "bake out" the adsorbed CO_2. In the IFM, Peggy used four pin/socket jumpers to provide connectivity between CDRA Bed 2's redundant temperature sensors B and C while bypassing the erratic temperature sensor A. After the jumpers were installed, CDRA was successfully activated.]*

RPC Trip Update: The trip of RPC-3 (Remote Power Controller 03) in RPCM (RPC Module) LA2B_G last weekend (2/24) has proved to have been due to an overcurrent. The RPC, which powers the MTL RFCA (Moderate Temperature Loop Rack Flow Control Assembly) in Node-1, used to provide more MTL flow to the US Airlock depress pump during EVAs, was closed yesterday morning and has remained closed to date, indicating the trip may have been spurious.

COL Update: Columbus module and systems are reported to perform nominally.

Weekly Science Update (Expedition Sixteen -- Week 19)

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Radiation measurements continue to be performed in the PIRS module. Radiation measurements continue to be performed in the PIRS module. The latest memory card exchange occurred yesterday (2/29).

ANITA: Completed.

BCAT-3 (Binary Colloidal Alloy Test 3): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): In progress.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): In progress.

EuTEF (European Technology Exposure Facility): On 02/26, the EuTEF MMU (Mass Memory Unit) troubleshooting procedure has been successfully performed and DHPU (Data Handling & Power Unit) full functionality has been recovered. To date, 8 out of 9 instruments have been checked out from ground, mostly successfully but with some anomalies under assessment. On 2/27, EuTEF platform had to be powered down ("graceful shutdown") after some erroneous TM (telemetry) was encountered. After power cycling, situation is back to nominal. The EuTEF science program via scripts will begin soon.

Fluid Science Laboratory (FSL): The FSL Facility commissioning continues this week and next week, with the following look-ahead activities for Week 20: - Last mechanical configuration;- First Fluid Science Laboratory (FSL) Rack activation and software upgrade;- Optical check-out activities;- GEOFLOW Experiment Container (EC) insertion into FSL; - GEOFLOW check-out activities; - First GEOFLOW science runs.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): In progress.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Following troubleshooting activities performed during Week 17, telemetry has been downlinked and analysed by KUBIK PD (Payload Developer). All is nominal.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Complete.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: Completed.

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION/REPOSITORY: “Leo, thank you for your attention to detail in completing the FD15 Nutr/Rep session. The information conveyed via crew notes was very helpful.”

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): In progress.

SOLAR (Solar Monitoring Observatory): Some software glitches have been repeatedly encountered with the Sun Pointing Device platform, and are currently under investigation. Temperature and power monitoring is ongoing and reported as nominal. Some anomalies have also been encountered with a sub-system (DIARAD) of the SOVIM instrument, which had to be powered off until further assessment. The SOLAR instruments are currently outgassing, and some calibrations of the SOLSPEC instrument lamps and some Command Schedules for SOL-ACES are performed before the science program is started.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): In progress.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: In progress.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): "Thanks Leo for your great work in setting up this first BIOLAB experiment! WAICO is now running autonomously in the Incubator. We encountered a silent Caution yesterday late night during the activation of the experiment, triggered by slightly too high O_2 concentration in the LSM (Life Support Module). We have now recovered the temperature, centrifuge, illumination and humidity controls; we expect no major science impacts so far. The nominal growth period is 14 days, and we will continue to monitor the plants on a daily basis."

CEO (Crew Earth Observation): Through 2/26 the ground has received a total of 15,305 frames of ISS/CEO imagery for review and cataloging. "After the break for STS-122 support, we are currently working through requested sessions for: South Tibesti Megafans; East Venezuela Land Use; Lake Nasser, Toshka Lakes, Egypt; Pilcomayo River Dynamics, Argentina; and the Ganges River Delta. We hope to provide feedback in the coming weeks. We have received only 137 new images since the recent crew change and look forward to more. Your recent, incredibly detailed view of Perth-Amboy, New Jersey will be published on NASA/GSFC's Earth Observatory Website this weekend."

CEO photo targets uplinked for today were **Lahore, Pakistan** *(weather was predicted to be clear for this nadir pass over the city of Lahore. Lahore is the second largest city in Pakistan, and is located on the banks of the River Ravi. Overlapping nadir mapping frames, taken along-track, were requested to capture a rural-urban-rural transect as ISS crossed the city from NW to SE),* **Florida Coastal Everglades, FL** *(this LTER [Long Term Ecological Research] site monitors the Everglades, Florida's "river of grass". Extensive human alteration of the surface hydrology of the region has produced numerous impacts on the Everglades' flora and fauna. ISS had a nadir pass along the southwestern coast of Florida; overlapping mapping frames of the coastal wetlands were requested),* **Central-Arizona Phoenix, AZ** *(ISS orbit track passed over the southwestern portion of the Phoenix metropolitan area - currently the focus of development in this important southwestern urban center. Study of the ecological changes that accompany urbanization in an arid climate is the focus of the Central Arizona-Phoenix LTER site. High resolution nadir frames acquired along track are useful for monitoring land use/land cover change resulting from urban development),* and **Madrean Sky Islands, N. America** *(the Madrean sky islands are enclaves of Madrean pine-oak woodlands, found at higher elevations in a complex of small mountain ranges in*

southern Arizona and New Mexico and northern Mexico. The sky islands are surrounded at lower elevations by the Sonoran and Chihuahuan deserts. Overlapping nadir mapping frames of the mountain summits and ridgelines, taken along track, were requested).

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 8:04am EST [= epoch]):
Mean altitude -- 342.4 km
Apogee height -- 344.0 km
Perigee height -- 340.8 km
Period -- 91.38 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0002399
Solar Beta Angle -- -42.5 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude loss in the last 24 hours -- 160 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53154

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
03/07/08 -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana) (~11:23pm EST); docking 4/3
03/09/08 -- *Change of US Standard Time to Daylight Saving Time*
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS (JLP) – 2:28am EDT, 16+1+2
03/12/08 -- ATV CAM (Collision Avoidance Maneuver) demo
03/12/08 -- STS-123/Endeavour/1J/A docking – ~11:27pm EDT
03/18/08 -- ATV1 parking orbit (loiter)
03/24/08 -- STS-123/Endeavour/1J/A undocking -- ~7:55pm
03/26/08 -- STS-123/Endeavour/1J/A deorbit – ~7:33pm; landing (KSC) -- ~8:35pm.
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking/landing (FGB nadir port)

05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/29/08
Date:	Friday, February 29, 2008 2:26:03 PM
Attachments:	

ISS On-Orbit Status 02/29/08

All ISS systems continue to function nominally, except those noted previously or below. *Today is February's fifth Friday, because of its 29 Leap Year days; the last time February had 5 Fridays was in 1980 and next time will be in 2036.*

Before breakfast and exercise, FE-2 Eyharts performed his first PHS (Periodic Health Status) w/Blood Labs examination. CDR Whitson assisted in drawing blood and using the U.S. PCBA (Portable Clinical Blood Analyzer). The second part of PHS, Subjective Clinical Evaluation, was performed later in the day. *[The PHS exam, with PCBA analysis and clinical evaluation, is guided by special software (IFEP, In-Flight Examination Program) on the MEC (Medical Equipment Computer). While PCBA analyzes total blood composition, the blood's hematocrit is particularly measured by the Russian MO-10 protocol.]*

In preparation for 1J/A arrival and transfer of the JAXA ELM-PS (Experiment Logistics Module - Pressurized Section), called JLP for short, the CDR installed the CBCS (Centerline Berthing Camera System) at the Node-2 zenith (upper) hatch, powered it up and checked it out. Afterwards, she disconnected the CBCS electronics cables to avoid hatch "dragthroughs". *[JLP will be transferred from the Shuttle cargo bay with the SSRMS on 3/14 and berthed at the Node-2 zenith CBM (Common Berthing Mechanism) during EVA-1 (of five EVAs total) by Rick Linnehan (EV1) & Garrett Reisman (EV2).]*

Afterwards, Whitson moved to the Airlock (A/L), connected EMU (Extravehicular Mobility Unit) #3008 to the SCU (Service & Cooling Umbilical) and initiated the standard 1-hr scrubbing process on the spacesuit's cooling water loops, filtering ionic and particulate matter (via a 3-micron filter). No iodination for biocide maintenance was required this time. The cooling loops were afterwards reconfigured and the EMU water processing kit disassembled and stowed. *[This prepared EMU #3008 for use on STS-123/docked.]*

FE-1 Malenchenko had 4 hrs set aside for a major IFM (Inflight Maintenance) on the Russian Thermal Control System (STR), to restore its Loop 1 (KOB1) by removing two units (BS) containing electric recirculation pumps (ENA) on the 3SPN2 pump panel and replacing them with spares from FGB stowage. *[Such R&Rs have been done before by previous crews.]*

Later, Malenchenko transferred the KAR01 SIS-1 kit from the DC1 and set it up in the Service Module (SM) for exposure and photography in preparation for the next SFP (Spaceflight Participant), arriving on Soyuz TMA-12/16S in April. *[KAR01 SIS-1, part of the KAR experiment suite of SFP/Visiting Cosmonaut Ko San from South Korea, a researcher at Samsung Advanced Institute of Technology, studies the growth pattern of vegetable cultures like soy, rice, radish, orchid seeds and others in the zero-G environment.]*

In the COL (Columbus Orbital Laboratory), after yesterday's preparatory work on the FSL (Fluid Science Laboratory) facility, Leo Eyharts today set up and configured the CEM-L (Central Experiment Module-Lower) for its activation and initiation of the first experiment run on Monday (3/3). *[ESA will attempt to complete five experiment runs within FSL prior to Flight 1J/A.].*

Peggy Whitson powered up the MSG (Microgravity Science Glovebox) and performed another session with the InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) experiment, today conducting runs #36 & #37, with a vial change from #002 to #007 between the runs and an increase in frequency from 0.66 Hz to 2Hz. Afterwards, the MSG was deactivated again. *[InSPACE obtains basic data on MR (magnetorheological) fluids, i.e., a new class of "smart materials" that can be used to improve or develop new brake systems, seat suspensions robotics, clutches, airplane landing gear, and vibration damper systems. The colloidal (dispersed) particles are contained in CAs (Coil Assemblies) in the MSG that subject them to electric fields at certain strength and frequencies. The desired strong dipolar interaction between the small colloidal particles can be achieved in micro-G simply with an external magnetic field being turned on and off. On the ground, the flow properties (rheology) of many materials, especially those making up consumer products like detergents, fabric softeners, toothpaste and paints, are similarly controlled, though not by magnetic fields but by adding a polymer. It now appears, for example, that new formulations of fabric softeners may perform better in space than on earth.]*

Yuri Malenchenko worked through a long list of standard maintenance/service tasks on Russian Segment (RS) systems. Specifically, the FE-1 –

- Completed the periodic (generally monthly) service of the ESA/RSC-Energia experiment ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS), removing its PCMCIA memory card (#943) from the AST

spectrometer (inserted on 2/15) and replacing it with a new card (#944), then, as usual, checking the used card on the RSK1 laptop for quantity and size of files;

- Employed the Russian IPD Draeger tube and CMS (Countermeasure System) samplers to take air samples for Carbon Monoxide (CO), to verify data obtained with the IPD-CO sampler on 2/25;
- Took readings of potentially harmful contaminants in the SM with the CMS (part of the GANK-4M Real-Time Harmful Contaminant Gas Analyzer system), which uses preprogrammed microchips to measure Formaldehyde (H_2CO, methanal), CO and Ammonia (NH_3), taking one measurement per microchip;
- Performed monthly maintenance on the deactivated Russian IK0501 GA (Gas Analyzer) of the SOGS Pressure Control & Atmospheric Monitoring System by replacing its CO_2 filter assembly (BF) with a new unit from FGB stowage (done last: 1./21), then reactivating the unit;
- Completed the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers];*
- Linked up with TsUP-Moscow stowage specialists at ~4:25am EST via S-band to conduct the weekly IMS (Inventory Management System) tagup, discussing stowage issues and equipment locations;
- Conducted the daily IMS maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/ import to its three databases on the ground (Houston, Moscow, Baikonur); and - working from the Russian voluntary “time permitting” task list -
- Completed the regular daily checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder), and
- Performed the daily monitoring, picture-taking and downloading on the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP).

Peggy gathered measurements for the weekly atmospheric status check for ppO_2 (Partial Pressure Oxygen) and $ppCO_2$ (pp Carbon Dioxide), using the hand-held CSA-CP (Compound Specific Analyzer-Combustion Products), CSA-O_2 (CSA - Oxygen sensor) and CDMK (CO_2 Monitoring Kit). Batteries were to be replaced if necessary. *[Purpose of the 15-min activity is to trend with MCA (Major*

Constituents Analyzer), i.e., to correlate the hand-held readings with MCA measurements. CSA-CP sensors (and readings) employed in the SM were #1051 (20.1%) & #1044/prime (20.3%); in Node-1 #1058 (19.0%); and in Node-2 #1045 (20.0%). O_2 sensor checks used #1052 (20.8%), #1041 (20.9%). CDMK CO_2 level in Lab was 0.5% and in SM 0.5%.]

As a fix for the erratic temperature sensor A of the CDRA (Carbon Dioxide Removal Assembly)'s absorbent bed #2, Whitson today installed a jumper cable to bypass the sensor, then supported the ground-commanded activation of CDRA (9:50am-11:50am) by connecting the regular ITCS LTL (Internal Thermal Control System/ Low Temperature Loop) coolant jumper at the LAB1D6 rack for cooling. *[The anomalous dP signature has not been explained yet, despite several days of troubleshooting.]*

Whitson and Eyharts conducted a 30-min review of new POC DOUG (Portable Onboard Computer Dynamic Onboard Ubiquitous Graphics) material, now using the new MSS (Mobile Service System) R5 software upgrade which mainly incorporates SPDM functionality into the MSS and PCS (Portable Computer System) displays. The review was for the SSRMS (Space Station Remote Manipulator System) activities scheduled on 3/4 (Tuesday). *[Next week's Robotics ops will essentially be the regular prelaunch checkout of the MSS/SSRMS complex for STS-139/1J/A, involving maneuvers to grapple the MBS PDGF-3 (Mobile Base System Power & Data Grapple Fixture 3), grapple & ungrapple the Node-2 PDGF, perform a checkout of the Cupola & Lab RWS (Robotics Workstation), and finish by moving the robotarm to the 1J/A start position.]*

Later today, before sleep time, Peggy will stand by to reconnect PCS laptops after ground specialists have finished uploading patches to the three C&C MDMs (Command & Control Multiplexer/Demultiplexer) computers. *[For loading the software patches (which deal with ATV Fire Warning and the Time Tag Queue), engineers have performed two Backup vs.Standby C&C swaps, followed by a Primary-to-Standby C&C transition about 12 hrs later. The CDR will reconnect PCSs after the C&C1 transition to Primary (C&C3 then being Backup & C&C2 Standby).]*

Leo Eyharts had another 60 minutes for himself for general orientation (station familiarization & acclimatization), as is standard daily rule for the first two weeks after starting station residency.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device

(CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1, FE-2).

Peggy then transferred the crew's exercise data file to the MEC laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~3:45am EST, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~4:45am, Leo conducted the regular weekly 15-min. audio tagup with ESA's Col-CC (Columbus Control Center) in Oberpfaffenhofen near Munich/Germany. *[S/G-2 (Space-to-Ground 2) phone patch via SSC-10 (Station Support Computer 10)]*.

At ~2:10pm, the crew had their twelfth weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC-10 (Station Support Computer 10)]*.

OGS Activation Update: By adding some water into the US OGS (Oxygen Generation System) WDS (Water Delivery System), the ground succeeded last night in activating the OGS. The system is currently generating O_2 at a nominal 3-person equivalent rate.

COL Update: Columbus module and systems are performing nominally.

CWC Update: An updated CWC (Contingency Water Container) "cue card" was uplinked for the crew's reference. *[The new card (16-0018V) lists 35 CWCs (~1427.9 L total) for the four types of water identified on board: technical water (812.9 L, for Elektron, flushing, hygiene), potable water (559.6 L), condensate water (54.7 L), waste/EMU dump and other (07 L). Of the 35 containers, nine CWCs with technical water (388.9 L) cannot be used until cleared for* Wautersia *bacteria, and 10 CWCs with potable water (427 L), transferred from Atlantis, are not cleared for use pending analysis of samples returning on 1E.]*

CEO photo targets uplinked for today were Hubbard Brook, New Hampshire *(there was snow on the ground and ice on the rivers this time of year for the first of two Long Term Ecological Research [LTER] sites. The main objective from the standpoint of CEO is a record of land cover/land use change on a seasonal basis. The Hubbard Brook Experimental Forest [HBEF] is a 3,160 hectare reserve located in the White Mountain National Forest, near Woodstock, New Hampshire. The on-site research program is dedicated to the long-term study of forest and associated*

aquatic ecosystems. Overlapping imagery of this area was requested), and Plum Island Ecosystem, Maine *(the second of two LTER sites for this day, the principal study site was the Plum Island Sound estuary, its coupled Parker, Rowley and Ipswich River watersheds and the adjacent coastal ocean, the Gulf of Maine. This LTER site focuses on how several aspects of global change influence organic matter and nutrients from land, ocean and marshes and how they interact with the external drivers [climate, land use, river discharge, sea level]. Overlapping imagery of this area was requested)*.

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Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
03/07/08 -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana) (~11:23pm EST); docking 04/03
03/09/08 -- *Change of US Standard Time to Daylight Saving Time*
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS (JLP) – 2:28am EDT, 16+1+2
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03/12/08 -- STS-123/Endeavour/1J/A docking – ~11:27pm EDT
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03/24/08 -- STS-123/Endeavour/1J/A undocking -- ~7:55pm
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03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry

04/08/08 -- Soyuz TMA-12/16S launch
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05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
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09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
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10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
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10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
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11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
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12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/28/08
Date:	Thursday, February 28, 2008 2:26:28 PM
Attachments:	

ISS On-Orbit Status 02/28/08

All ISS systems continue to function nominally, except those noted previously or below.

For the purpose of testing the main TORU (Teleoperator Control System) receiver on Progress M-63/28P, FE-1 Malenchenko and CDR Whitson worked with ground specialists via VHF on DO3 (Daily Orbit 3) in the standard vehicle-to-vehicle TORU checkout between the Service Module (SM) and the docked Progress 28P. Progress thrusters (DPO) were inhibited and not involved. *[Crew activities focused on TORU activation, inputting commands via the RUO Rotational Hand Controller and close-out ops. TORU lets an SM-based crewmember perform the approach and docking of automated Progress vehicles in case of failure of the automated KURS system. Receiving a video image of the approaching ISS, as seen from a Progress-mounted docking television camera ("Klest"), on a color monitor ("Simvol-Ts", i.e. "symbol center") which also displays an overlay of rendezvous data from the onboard digital computer, the crewmember steers the Progress to mechanical contact by means of two hand controllers, one for rotation (RUO), the other for translation (RUD), on adjustable armrests. The controller-generated commands are transmitted from the SM's TORU control panel to the Progress via VHF radio. In addition to the Simvol-Ts color monitor, range, range rate (approach velocity) and relative angular position data are displayed on the "Klest-M" video monitor (VKU) which starts picking up signals from Progress when it is still approximately 7 km away. TORU is monitored in real time from TsUP over Russian ground sites (RGS) and via Ku-band from Houston, but its control cannot be taken over from the ground.]*

Peggy Whitson reloaded her handheld PDA (Personal Digital Assistant) with new data from SSC (Station Support Computer), i.e., an updated PDA image with all applications and a new PDA IMS (Inventory Management System) database. She also deleted some hi-res imagery to free up storage space. *[The PDA is periodically synchronized manually with the latest IMS data via wireless (WiFi) connection to the network. The IMS database can be updated from the handheld*

by using a PDA Expansion Pack and BCR (Bar Code Reader) Scanner module.]

Working a series of switches, the CDR performed a Power On/Off checkout of the new SSPCM (Solid State Power Control Module) which Dan Tani installed on 2/17 in the HRF1 (Human Research Facility Rack 1) in the US Lab.

With the Biolab WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels #1) experiment in the COL (Columbus Orbital Laboratory) now well into its first run, FE-2 Eyharts continued commissioning activities on the FSL (Fluid Science Laboratory), first removing the four launch fixation bolts installed yesterday on the front part of the CEM-L (Central Experiment Module-Lower) for the reboost, and then installing drawer handles on it. *[The remainder of CEM-L setup is scheduled tomorrow (2/29) so that FSL can be activated on Monday (3/3). ESA will attempt to complete five experiment runs within FSL prior to Flight 1J/A.]*

Later, Leo Eyharts continued activation & checkout ops on the ELITE-S2 (Elaboratore Immagini Televisive - Space 2) payload by connecting camera cables to its IMU (Interface Management Unit) and routing the cables in the Lab for another session. *[The Italian (ASI) experiment ELITE-S2 is a human motion analysis facility for technological characterization and potential application for multifactorial movement analysis, to study the connection between brain, visualization and motion in micro-G. By recording and analyzing the three-dimensional motion of astronauts, this study should help engineers apply ergonomics into future spacecraft designs and determine the effects of weightlessness on breathing mechanisms for long-duration missions.]*

Whitson configured IMV (Intermodular Ventilation) air ducting to the US Airlock (A/L) for temperature and humidity control after ground-commanded (S-band) deactivation of the A/L CCAA (Common Cabin Air Assembly) earlier today (4:00am-8:45am).

Peggy downloaded the structural dynamics data gathered by the IWIS (Internal Wireless Instrumentation System) during the overnight reboost, to be downlinked later via OCA. Afterwards, Peggy tore down the IWIS setup of RSUs (Remote Sensor Units) ands cabling for stowage.

Later, the CDR turned on the MSG (Microgravity Science Glovebox) and performed another session with the InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) experiment, today conducting run #35 (vial 002), going back again to the lowest frequency (0.66 Hz) but at higher field strength (which tends to result in significant particle structures). Afterwards, she powered down the MSG. *[InSPACE obtains basic data on MR (magnetorheological) fluids, i.e., a new class of "smart materials" that can be used to improve or develop new*

brake systems, seat suspensions robotics, clutches, airplane landing gear, and vibration damper systems. The colloidal (dispersed) particles are contained in CAs (Coil Assemblies) in the MSG that subject them to electric fields at certain strength and frequencies. The desired strong dipolar interaction between the small colloidal particles can be achieved in micro-G simply with an external magnetic field being turned on and off. On the ground, the flow properties (rheology) of many materials, especially those making up consumer products like detergents, fabric softeners, toothpaste and paints, are similarly controlled, though not by magnetic fields but by adding a polymer. It now appears, for example, that new formulations of fabric softeners may perform better in space than on earth.]

Using files uplinked from TsUP-Moscow, FE-1 Malenchenko installed new BVS (SM Computer System) software images on the KTsP1 (Central Post Computer 1) in the SM from a laptop, displaying settings for computers to be upgraded (e.g., TsVM Central Computers, TVM Terminal Computers, US-21, US-22, MDM-FGB, US-FGB).

Leo Eyharts set up the equipment for the US PHS (Periodic Health Status) assessment with blood labs, to be performed by him tomorrow using the PCBA (Portable Clinical Blood Analyzer). Preparations included an electronic function test and control analysis on the PCBA in preparation for tomorrow's blood analysis activity. *[The PHS exam, with PCBA analysis and subsequent clinical evaluation, is guided by special software (IFEP, In-Flight Examination Program) on the MEC (Medical Equipment Computer).*

Peggy Whitson conducted the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week. The current cue card (16-0018U) lists 36 CWCs (~1392.5 L total) for the four types of water identified on board: technical water (812.9 L, for Elektron, flushing, hygiene), potable water (559.6 L), condensate water (20 L), waste/EMU dump and other (0 L). Of the 36 containers, nine CWCs with technical water (388.9 L) cannot be used until cleared for* Wautersia *bacteria, and 10 CWCs with potable water (427 L), transferred from Atlantis, are not cleared for use pending analysis of samples returning on 1E.]*

CDR Whitson and FE-2 Eyharts performed the mandatory 60-min Emergency Event OBT (Onboard Training) drill for new crewmembers, for the case of rapid cabin depressurization or fire. Russian and US experts stood by at both control centers for consultation. The rule is that the Russian-led emergency exercise should be performed by every new station crewmember once within seven days after departure of the previous crew. *[Background: Purpose of the drill for new station residents is to (a) familiarize them with the location of hardware and the positions of*

valves used in emergency situations, (b) familiarize them with the translation routes to the Soyuz vehicle, (c) work through the Russian Segment (RS) hardware deactivation procedures, (d) familiarize them with the particulars of the scenario and the results of the previous US Segment (USOS) fire drill, and (d) practice crew interactions in emergency situations. Referring to EMER book crew procedures, first Peggy and Leo translated along the emergency egress path to the FGB nadir port (where Soyuz TMA-11 is currently docked), checking hardware such as the Sokol suits, cable cutters, fire extinguisher (OKR), gas masks (IPK), emergency procedures books, valve settings, hatch rubber seal & restraint integrity, etc. In the USOS the inspection focused on fireports in the Lab, Node and Airlock, readiness of CSA-CP (Compound Specific Analyzer-Combustion Products), ISS leak kit, PBAs (portable breathing assemblies) and PFEs (portable fire extinguishers), emergency procedures books, valve settings, integrity of hatch rubber seals, presence of hatch handrails, etc. The exercise was topped off by a thorough debrief with the ground via S-band. During the session, the crew simulated executing the planned emergency procedures while moving about the station. For the case of an onboard fire and for emergency descent, there are other mandatory emergency drill OBTs.]

Yuri Malenchenko continued his test program with the new KPT-2 BAR-RM payload equipment begun on 2/13, today taking measurements with the AU-1 ultrasound analyzer in the PrK Transfer Tunnel to the DC1 (Docking Compartment) and FGB GA (Pressurized Compartment) and later downlinking the data via BSR-TM channel. Measurements in the SM RO2 (large diameter) and RO1 (small diameter) sections were taken on 2/16 and 2/26. The data are being used for experimenting with ISS leak detection. *[BAR-RM is designed to develop a procedure for detection of air leakage from ISS modules based on environmental data anomalies (temperature, humidity, ultrasound emissions) at possible leak locations. The payload, controlled from the RSK1 laptop, uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/thermometer (TTM-2), an ultrasound analyzer (AU-01), and a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station. Measurements are taken in specific zones (13 in SM PkhO and 4 in DC1), both with lights & fans turned on and off.]*

The FE-1 completed routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Malenchenko also performed the daily IMS maintenance, updating/editing its

standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Later, Yuri conducted the daily monitoring, picture-taking and downloading on the BIO-5 Rasteniya-2 ("Plants-2") experiment. The task included recharging the water tank of the greenhouse as required. *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. During the duration of the BIO-5 experiment, students of the Moscow City Palace for Youth Creativity of the Meshchansky inter-regional center #15 in Moscow) and the Prince of Oldenburg Lyceum in St. Petersburg will be cultivating plants in parallel on the ground and conducting comparative observation of plant growth and development under gravity and zero-gravity conditions. They are receiving the photo images taken by Yuri.]*

In addition, working from the Russian voluntary “time permitting” task list, the Russian flight engineer completed the regular checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder). *[This is a daily monitoring/temp checking, carried on the Russian voluntary task list for the duration of Expedition 16].*

At 2:55pm EST, Peggy is scheduled to conduct the periodic VHF-1 emergency communications check over NASA’s VHF (Very High Frequency) stations, today at the Dryden, Wallops and White Sands VHF sites, talking with Houston/Capcom, MSFC/PAYCOM (Payload Operation & Integration Center Communicator) and Moscow/GLAVNI (TsUP Capcom) in the normal fashion via VHF radio from a handheld microphone and any of the U.S. segment ATUs (audio terminal units). *[Purpose of the test is to verify signal reception and link integrity, improve crew proficiency, and ensure minimum required link margin during emergency (no TDRS) and special events (such as a Soyuz relocation).]*

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR) and VELO bike with bungee cord load trainer (FE-1, FE-2).

Peggy then transferred the crew’s exercise data file to the MEC (Medical Equipment Computer) laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Leo had another 60 minutes for himself for general orientation (station familiarization & acclimatization), as is standard daily rule for the first two weeks after starting station residency.

At ~10:30am EST, the ISS crew held a teleconference (audio) with crewmembers of the upcoming 1J/A mission, discussing timeline, transfer and handover particulars of their joint (docked) period next month. *[Launch of STS-123/Endeavour, carrying the Canadian SPDM "Dextre" and the ELM-PS (Experiment Logistics Module - Pressurized Section) for the Japanese "Kibo" Laboratory (to follow on 5/25), is scheduled for 3/11 at 2:28am EDT, with the crew of CDR Dominic Gorie, PLT Greg Johnson, MS1/EV1/2 Bob Behnken, MS2/EV2 Mike Foreman, MS3 Takao Doi/ JAXA, MS4/EV1 Rick Linnehan, and MS5/EV2/FE-2-16 Garrett Reisman. Reisman will take over the ISS FE-2 position from Léopold Eyharts who returns on Endeavour on 3/24 (landing 3/28).]*

GNC MDM Upload Update: Yesterday's uploading of new software patches to both GNC MDMs (Guidance, Navigation & Control Multiplexer/Demultiplexer) computers went well. One patch limits CMG (Control Moment Gyroscope) Gimbal Acceleration, the other controls Attitude Filter Reset.

ISS Reboost Update: The overnight ISS reboost with the SM's two KD main engines (694 lbs thrust each) and ODU props, started at 00:16am EST and completed successfully, with a slight overburn: Planned Delta-V was 3.0 m/s vs. 3.1 m/s actual, resulting in a mean altitude increase of 5.3 km (2.9 nmi). Burn duration: 123.57 sec. Preliminary results indicate that the reboost will adequately support Soyuz 16S docking, Soyuz 15S undocking, and Flight 1J/A as planned.

RSK1 Laptop Failure Update: Malenchenko's second attempt, on 2/27, to load the Russian RSK1 laptop with ATV (Automated Transfer Vehicle) docking simulator software was unsuccessful. Specialists are developing a procedure for using the previous software (vers. 1.2) for conducting the ATV CBT (Computer-based Training) on the laptop.

SRK-V Condensate Feed Unit Update: Continued attempts to troubleshoot the failed CFU (Condensate Feed Unit) pump of the Russian SRV-K (Condensate Water Processor) in the SM were unsuccessful. Energia/Moscow is developing a new plan for restoring the system.

OGS Activation Failure: Last night, the ground-commanded startup of the US OGS (Oxygen Generation System) failed in the middle of the start-up sequence, shortly into the crew's sleep period. This has been seen before and appears to be associated with a recirculation pump anomaly. After several attempts to start up the

system on Wednesday, teams decided to stand down and review data. OGS remains off at this time.

COL Update: Columbus module and systems are performing nominally.

CEO photo targets uplinked for today were **Shanghai, China** *(weather satellites suggested a relatively clear day for this often smog covered city. Shanghai is the largest city in China and the eighth largest city in the world. It is situated on the banks of the Yangtze River Delta. Documenting detail within the city boundaries and land use outside of the city),* **Ulawun Volcano** *(the lighting will be lower than for usual requests for CEO targets. However, low light also accentuates the topographic features of most volcanoes. Ulawun volcano is the highest volcano of the Bismarck arc, and one of Papua New Guinea's most frequently active. Historical eruptions date back to the beginning of the 18th century. Twentieth-century eruptions were mildly explosive until 1967, but after 1970 several larger eruptions produced numerous lava flows, greatly modifying the summit crater),* **South Tibesti Megafans** *(a series of large fanlike spreads of sediment, hundreds of km long and wide, extend southward from the Tibesti Mountains into the Bodélé depression of central Chad. A discontinuous overlapping pattern of stream channels, large and small, suggests that the entire surface of the megafans was formed by the action of rivers shifting across the surface. Since about 8000 years ago, the Sahara environment has dried significantly, leaving non-functioning rivers channels everywhere. Images of areas south of Tibesti are only available in low resolution: therefore crew imagery--continuous mapping swaths taken with 400- and 800 mm lenses--are needed to provide the detail to reveal evidence of stream process and the intersection of streams on different fan surfaces),* **Presqu'ile Impact Crater** *(there are no images of this particular impact crater in the CEO database. Presqu'ile crater is 24 kilometers in diameter and is estimated to be less than 500 million years old),* and **Konza Prairie, Kansas** *(the focal site for the Konza Prairie Long Term Ecological Research program is the Konza Prairie Biological Station [KPBS]. KPBS is a 3,487 hectare native tallgrass prairie field research station owned by The Nature Conservancy and Kansas State University. KPBS is located in the Flint Hills region of northeastern Kansas. The Flint Hills encompasses over 50,000 square km throughout much of eastern Kansas from near the Kansas-Nebraska border south into northeastern Oklahoma and contains the largest remaining area of unplowed tallgrass prairie in North America).*

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 10:07am EST [= epoch]):
Mean altitude -- 342.5 km
Apogee height -- 343.8 km
Perigee height -- 341.1 km
Period -- 91.38 min.
Inclination (to Equator) -- 51.65 deg
Eccentricity -- 0.0001991
Solar Beta Angle -- -50.7 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.76
Mean altitude gain in the last 24 hours -- 5300 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53107

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
03/07/08 -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana) (~11:23pm EST); docking 04/03
03/09/08 -- *Change of US Standard Time to Daylight Saving Time*
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS – 2:28am EDT, 16+1+2
03/12/08 -- ATV CAM (Collision Avoidance Maneuver) demo
03/12/08 -- STS-123/Endeavour/1J/A docking – ~11:27pm EDT
03/18/08 -- ATV1 parking orbit (loiter)
03/24/08 -- STS-123/Endeavour/1J/A undocking -- ~7:55pm
03/26/08 -- STS-123/Endeavour/1J/A deorbit – ~7:33pm; landing (KSC) -- ~8:35pm.
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking/landing (FGB nadir port)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)

09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/27/08
Date:	Wednesday, February 27, 2008 1:31:53 PM
Attachments:	

ISS On-Orbit Status 02/27/08

All ISS systems continue to function nominally, except those noted previously or below.

Upon wakeup, FE--2 Eyharts performed the last sampling of his first session with the NASA/JSC experiment NUTRITION w/Repository, collecting a final urine sample for storage in the MELFI (Minus-Eighty Laboratory Freezer for ISS). The sampling kit was then stowed away. Leo's next NUTRITION/Repository activity will be his Flight Day 30 (FD30) session. *[The current NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

FE-1 Malenchenko and CDR Whitson continued the current round of periodic preventive maintenance of RS (Russian Segment) ventilation systems. *[In the Service Module (SM), Yuri cleaned the inlet fan (MTs12-4) grille of the BMP (Micropurification Unit), temporarily deactivated, after visually inspecting and photographing the grille (on panel 419). Peggy later worked in the FGB, accessing and cleaning the vent screens of specific interior closeout panels (116, 231, 316 & 431).]*

In preparation for tonight's station reboost from the two-nozzle SM main engine, the CDR installed an IWIS RSU (Internal Wireless Instrumentation System Remote Sensor Unit) in Node-2, hooking it up to UOP2 (Utility Outlet Panel 2) for power. Afterwards, Whitson configured and programmed the timing of the IWIS ICU (Interface Control Unit) for tonight's activation. *[Along with the new unit in Node-2, IWIS will monitor dynamic/vibrational responses of the ISS structure during the reboost, measured by RSUs in the Lab, Node-1, FGB and SM (in Sync Mode),*

transmitting their measurements via radio to the central NCU (Network Control Unit).]

FE-2 Eyharts set up and configured the VCA-2 (Video Camera Assembly 2) in the Columbus Orbital Laboratory (COL) module to capture the subsequent emergency drill.

All three crewmembers then performed the 90-min Columbus New Module "Delta" Emergency Procedure Drill, tailored for the new addition to the station, *[Purpose of the "Delta" OBT (Onboard Training) exercise, mandatory at no later than 7-10 days after arrival of the new module, was to familiarize the crew with COL hardware and valves used in emergency situations and with the new Ammonia Detection Kit location, hardware and cue cards, and to review new, stand-alone COL emergency procedures, including the "big picture" changes to the existing emergency procedures due to the new module addition. For example: the increased station volume increases the ISS reserve time in case of a leak (to ~1240 min, from ~1070 min); additional equipment safing would be required; the sequence of closing hatches for USOS (US Segment) leak checks will be impacted; more volume is now available for utilizing USOS atmosphere for RS (Russian Segment) leaks; while the automated response to a Rapid Depress situation for COL is consistent with the automated response for the other USOS modules, although automatically commanded COL hardware is added, etc. COL does not have PBA (Portable Breathing Apparatus) oxygen ports and no EHTKs (Extension Hose Tee Kits) for PBA, the nearest location for both being in Node-2.]*

Eyharts continued preparing the COL BLBG (Biolab Glovebox) for the upcoming experiment WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels). *[After preparing and sterilizing two sets of sample Experiment Containers (Ecs #1-4 & #5-8) yesterday, then inserting them in the BLBG TCU (Thermal Control Unit), both EC sets were installed today in the incubator for starting the experiment. The WAICO samples require a 14-day growing period and will be returned on Flight 1J/A.]*

With the Russian Elektron O_2 (oxygen) generator powered off since yesterday, CDR Whitson supported the activation of the new OGS (Oxygen Generation System) in the US Lab by configuring the OGS rack and the H_2 (hydrogen) sensor for activation. The subsequent power-up of the rack was performed from the ground via S-band/telemetry commanding. *[After the OGA (Oxygen Generation Assembly) had been running for 20 min for a leak check of the dome, Whitson reconnected the H_2 sensor QDs (Quick Disconnects), closed the rack door and re-attached the WDS (Water Delivery System) for its subsequent activation. OGS is one of the three Regenerative ELCSS system racks slated to be installed in Node 3.]*

In the Soyuz 15S spacecraft, docked at the FGB nadir port, Malenchenko turned off the gas analyzer, terminating its periodic checkup activity.

Peggy Whitson performed the periodic offloading of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1054) with the collected water slated for processing. No samples were required this time. *[Estimated offload time before termination (leaving ~6 kg in the tank): ~30 min.]*

After the aborted software upgrade of the Russian RSE1 laptop on 2/24, Yuri Malenchenko today had 2 hrs reserved for troubleshooting the RSE1 machine, conducting a health check of the installed HDD (Hard Disk Drive) and reloading the RSE version 1.2 software for further checkout. *[With the new ATV CBT (Automated Transfer Vehicle Computer-based Training) application the crew will be able to run ATV docking simulations on the laptop.]*

Yuri conducted an audit/inventory of RS ODF (Operations Data File) cue cards for spacewalks, including assessing their condition and readiness for use on EVAs.

The FE-1 also downlinked Part 2 of the prerecorded video of "Life aboard ISS" footage filmed by Peggy with the SONY HRV-Z1 high-definition camcorder on 2/22 for use on Russian television. *[TsUP-Moscow had suggested scenes of Yuri working with the Matryoshka radiation detectors, filling the Elektron EDV container with US condensate water, and other scenes of interest to TV viewers including crewmembers washing their faces, brushing their teeth, exercising, cooking meals, conducting science research and servicing life support systems. Part 1 of the recorded footage was downlinked yesterday.]*

In preparation for tonight's station reboost, Leo Eyharts worked on the Columbus FSL (Fluid Science Laboratory), temporarily re-attaching the FSL FCE (Facility Core Element) drawer structure to the rack by means of the four launch fixations bolts used during COL launch. *[After the reboost, the launch captive bolts will be removed again and the protective gap covers re-installed. The need for the lock-down of the FCE during a reboost was indicated by an updated structural analysis.]*

The FE-1 completed routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Yuri also worked on the "Matryoshka-R" radiation payload suite (RBO-3-2),

conducting the periodic collection and logging of accumulated data of seven Matryoshka-R Bubble Dosimeter detectors installed on 2/22 at various exposure locations in the RS, using the special Bubble Dosimeter Reader. *[The complex Matryoshka payload suite is designed for sophisticated radiation studies. Three detectors now in use are positioned in spherical "Phantom" containers in the DC1, four in the stbd crew cabin, under the work table, and behind a panel (#327).]*

In addition, working from the Russian voluntary "time permitting" task list, the Russian flight engineer --

- Performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur);
- Conducted the regular checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder) *[This is a daily monitoring/temp checking, carried on the Russian voluntary task list for the duration of Expedition 16];* and
- Performed the daily monitoring, picture-taking and downloading on the BIO-5 Rasteniya-2 ("Plants-2") experiment. Today's task was extended to include recharging the water tank of the greenhouse. *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. During the duration of the BIO-5 experiment, students of the Moscow City Palace for Youth Creativity of the Meshchansky inter-regional center #15 in Moscow) and the Prince of Oldenburg Lyceum in St. Petersburg will be cultivating plants in parallel on the ground and conducting comparative observation of plant growth and development under gravity and zero-gravity conditions. They are receiving the photo images taken by Yuri.]*

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Peggy then transferred the crew's exercise data file to the MEC (Medical Equipment Computer) laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

As most every day after his arrival, when not busy with urgent Columbus commissioning work, Leo had another 60 minutes for himself for general orientation (station familiarization & acclimatization), as is standard daily rule for the first two weeks after starting station residency.

At ~12:30pm EST, Peggy Whitson supported two interactive PAO TV interviews with US media of ~10 min each: The Hawk Eye Newspaper, Burlington, IA (Craig Neises), and KCCI-TV in Des Moines, IA (Molly Cooney).

GNC MDM Swap: At about 10:00am, Houston ground controllers started loading new software patches to both GNC MDMs (Guidance, Navigation & Control Multiplexer/Demultiplexer) computers, one to control CMG (Control Moment Gyroscope) Gimbal Acceleration, the other for Attitude Filter Reset. Executing the loading required swapping the two MDMs at ~11:30am between Prime and Backup, ending with GNC-1 being primary MDM. During the swap activities, the ISS was controlled by Russian MCS (Motion Control System) thrusters, with attitude control authority handed over from US CMG Momentum Management at 11:25am, to be returned later today (~3:50pm).

ISS Reboost: Attitude control will again be turned over to RS tonight at ~10:30pm for the duration of the planned ISS reboost. The thrust maneuver, with the SM's two-barrel KD main engine and ODU props, is scheduled for ~00:21am EST, with a planned delta-V of 3.2 m/s. Some US systems will be powered down for the maneuver and afterwards reactivated. Attitude control authority will then be returned to USOS at ~1:20am. For both MCS/thruster periods, the protective Lab science window shutters will remain closed.

MSS Software Upgrade: All MSS/SSRMS (Mobile Service System/Space Station Remote Manipulator System) software Vers. R5.0 uplinks and checkouts were successfully completed; PCS (Portable Computer System) A31p laptops were patched without issues. *[The update was required to incorporate Dextre/SPDM (Special Purpose Dexterous Manipulator) functionality into the MSS. In addition, there were a few updates to the SSRMS and MBS (Mobile Base System) behavior as well as new SPDM PCS displays. The crew's next Robotics operations will occur on the new MSS R5 software. In prep for that, the ground will uplink a brief summary of system behavior changes for the DOUG (Dynamic Onboard Ubiquitous Graphics) software review for those ops.]*

CDRA Troubleshooting Update: Carbon Dioxide Removal Assembly dP (delta Pressure) troubleshooting was completed. Nothing was found that could explain the anomalous dP signature. For the CDRA's erratic temperature sensor, a bypass jumper cable will be installed on 2/29 (Friday).

STS-123/1J/A Preview: JAXA reported that preparations for Flight 1J/A continue on schedule. Launch of STS-123/Endeavour, carrying the Canadian SPDM "Dextre" and the ELM-PS (Experiment Logistics Module - Pressurized Section) for the Japanese "Kibo" Laboratory (to be launched 5/25), is scheduled for 3/11 at 2:28am EDT, with the crew of CDR Dominic Gorie, PLT Greg Johnson, MS1/EV1/2 Bob Behnken, MS2/EV2 Mike Foreman, MS3 Takao Doi/JAXA, MS4/EV1 Rick Linnehan, and MS5/EV2/FE-2-16 Garrett Reisman. Reisman will take over the ISS FE-2 position from Léopold Eyharts who returns on Endeavour on 3/24 (landing 3/28)..

CEO photo targets uplinked for today were **Eastern Tien Shan, China** *(looking left to obtain general views of winter conditions on these mountains, especially snow pack and glacier tongues),* **Chaing Mai, Thailand** *(this is northern Thailand's largest and most culturally significant city. Chaing Mai and two neighboring cities form a major population cluster [700,000] in a mountain valley. The cities are difficult to discern from orbit. However, the valley floor where the cities are located is light gray compared with the surrounding dark green mountains. Looking left of track up the Ping River valley. General orientation views were requested),* **Saharan dust, Chad** *(Dynamic event. Spring winds are setting up in the central Sahara Desert, with dust plumes being raised from the basin just north of Lake Chad. This basin—the Bodele basin--supplies more dust to the Earth's atmosphere than any other on the planet, with some dust reaching the Americas every season. Looking left as the plumes blow towards track),* and **Ile Rouleau Impact Crater, Canada** *(this small impact crater [~4 km in diameter] lies partly under water in long, narrow Lake Mistassini. However, it is relatively easy to locate as the center uplift forms an island, close to nadir.)*

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http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 8:31am EST [= epoch]):
Mean altitude -- 337.4 km
Apogee height -- 342.7 km
Perigee height -- 332.2 km
Period -- 91.28 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007794
Solar Beta Angle -- -54.3 deg (magnitude decreasing)

Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 66 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53107

Significant Events Ahead *(all dates Eastern Time, some changes possible.):*
02/28/08 -- ISS Reboost w/IWIS, SDMS (TIG 00:21am EST; delta-V~3.2 m/s; SM KD prop.sys.)
03/07/08 -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana) (~11:23pm EST); docking 04/03
03/09/08 -- *Change of US Standard Time to Daylight Saving Time*
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS – 2:28am EDT, 16+1+2
03/12/08 -- ATV CAM (Collision Avoidance Maneuver) demo
03/12/08 -- STS-123/Endeavour/1J/A docking – ~11:23pm
03/18/08 -- ATV1 parking orbit (loiter)
03/24/08 -- STS-123/Endeavour/1J/A undocking -- ~7:43pm
03/28/08 -- STS-123/Endeavour/1J/A landing -- ~3:00pm.
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking/landing (FGB nadir port)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
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08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking

10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
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2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/26/08
Date:	Tuesday, February 26, 2008 2:51:52 PM
Attachments:	

ISS On-Orbit Status 02/26/08

All ISS systems continue to function nominally, except those noted previously or below.

To conclude his first session with the NASA/JSC experiment NUTRITION w/ Repository, FE-2 Eyharts completed the all-day Part 2 session, by collecting urine samples for 24 hrs, to continue through tomorrow morning. The samples were consecutively stored in the MELFI (Minus-Eighty Laboratory Freezer for ISS). Blood collections were performed by Peggy on Leo yesterday. *[The current NUTRITION/Repository project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

The CDR set up the camcorder equipment for taking video of Leo Eyharts' first PFE-OUM (Periodic Fitness Evaluation - Oxygen Uptake Measurement session on the CEVIS (Cycle Ergometer with Vibration Isolation), filmed via VTR (Video Tape Recorder) from the ground. *[The footage was downlinked afterwards for biomechanical evaluation of the exercising crewmember and assessment of the on-orbit setup of equipment during data collection and hardware status.]*

Later, Whitson and Eyharts configured the PFE-OUM equipment at the HRF-2 (Human Research Facility 2) rack for Leo's workout on the CEVIS while wearing an HRM (Heart Rate Monitor), with Peggy, as operator, obtaining measurements of the subject. *[The equipment includes the HRF PFM/PAM (Pulmonary Function Module/ Photoacoustic Analyzer Module), Mixing Bag System and GDS (Gas Delivery System). After calibration of the DPFM (Differential Pressure Flowmeter), Peggy assisted in changing the loads on the ergometer and recording data. Later, the two*

crewmembers updated the evaluation protocol, deactivated & stowed the gear, and powered down the PFE-OUM laptop. Purpose of PFE-OUM is to measure aerobic capacity during exercise within 14 days after arrival on ISS, and once monthly during routine PFEs. The data allows exercise physiologists & flight doctors to assess the crew's health & fitness and to provide data for modifying & updating crew-specific exercise regimes. PFE-OUM is a collaborative effort between NASA and ESA (European Space Agency).]

Afterwards, the CDR disassembled the video setup and stowed it, then gave the Go for the ground to downlink the VTR video.

Earlier, Yuri also downlinked the prerecorded video of "Life aboard ISS" footage filmed by Peggy with the SONY HRV-Z1 high-definition camcorder on 2/22 for use on Russian television. *[TsUP-Moscow had suggested scenes of Yuri working with the Matryoshka radiation detectors, filling the Elektron EDV container with US condensate water, and other scenes of interest to TV viewers including crewmembers washing their faces, brushing their teeth, exercising, cooking meals, conducting science research and servicing life support systems. More recorded footage is to be downlinked tomorrow.]*

In the Columbus Module, Eyharts continued preparing the BLBG (Biolab Glovebox) for the upcoming experiment WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels). *[Preparations include installing the first four ECs (Experiment Containers, #1-4) in the BLBG, supporting Glovebox sterilization by the ground, preparing the ECs for operation, and installing the video cassette for the first run. After starting these activities yesterday, they fell behind the original timeline, which has delayed the actual start-up of the experiment.]*

FE-1 Malenchenko continued his test program with the new KPT-2 BAR-RM payload equipment begun on 2/13, today taking measurements with the AU-1 ultrasound analyzer at various locations in the RO1 (small diameter) section of the Service Module (SM) and later downlinking the data via BSR-TM channel. Measurements in the SM RO2 (large diameter) section were taken on 2/16. The data are being used for experimenting with ISS leak detection. *[BAR-RM is designed to develop a procedure for detection of air leakage from ISS modules based on environmental data anomalies (temperature, humidity, ultrasound emissions) at possible leak locations. The payload, controlled from the RSK1 laptop, uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/thermometer (TTM-2), an ultrasound analyzer (AU-01), and a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station. Measurements are taken in specific zones (13 in SM PkhO and 4 in DC1), both with lights & fans turned on and off.]*

Whitson conducted “Week 19” sampling of potable water for chemical and microbial analysis from the SVO-ZV tap and two SRV-K taps, the latter after preliminary heating of the water (four heating cycles) and flushing. *[Peggy collected three 450 mL samples (for postflight microbial analysis) and two 750 mL samples (for postflight chemical analysis) from each of three ports (SRV-K hot, SRV-K warm, SVO-ZV) for return on STS-123/1J/A. The small amounts of water used for flushing the equipment were reclaimed from the flush bag.]*

The CDR retrieved and stowed the two FMKs (Formaldehyde Monitoring Kits) deployed by her two days ago (2/24) in the Lab (below CEVIS cycle) and SM (most forward handrail on panel 307) to catch any atmospheric formaldehyde (H_2CO, methanal) on a collector substrate for subsequent analysis on the ground. *[Formaldehyde is an intermediate in the oxidation (combustion) of methane and other carbon compounds, e.g., forest fires, in automobile exhaust, and in tobacco smoke. Small amounts of formaldehyde are produced as a metabolic byproduct in most organisms, including humans.]*

In preparation for tomorrow’s scheduled activation of the US OGS (Oxygen Generation System) in the Lab for its next phase of checkout, FE-1 Malenchenko supported TsUP in deactivating the Elektron O_2 generator. As part of the standard deactivation process the Elektron was purged with N_2 (nitrogen), controlled from laptop.

Meanwhile in the US Lab Peggy worked with the ground in activating the SAMS ICU (Space Acceleration Measurement System/Interface Control Unit), the control computer of the rack/drawer-based system for recording structural dynamics of the station.

Malenchenko transferred a control panel (PU) for the ATV (Automated Transfer Vehicle) to its operational location in the SM for installation.

Yuri also had ~90 min set aside for the periodic equipment servicing in the SM’s ASU toilet facility, changing out replaceable parts with new components, viz., two receptacles (PR & MP), four hoses, a T-connector, an elbow fitting, an indicator, a filter insert (F-V), the pretreat container (E-K) with its hose. All old parts were discarded as trash. *[E-K contains five liters of pre-treat solution, i.e., a mix of H_2SO_4 (sulfuric acid), CrO_3 (chromium oxide, for oxidation and purple color), and H_2O (water). The pre-treat liquid is mixed with water in a dispenser (DKiV) and used for toilet flushing.]*

Afterwards, the FE-1 completed the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

In addition, working from the Russian voluntary "time permitting" task list, the Russian flight engineer --

- Performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur);
- Conducted the regular checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder) *[This is a daily monitoring/temp checking, carried on the Russian voluntary task list for the duration of Expedition 16];* and
- Performed the daily monitoring, picture-taking and downloading on the BIO-5 Rasteniya-2 ("Plants-2") experiment. *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. During the duration of the BIO-5 experiment, students of the Moscow City Palace for Youth Creativity of the Meshchansky inter-regional center #15 in Moscow) and the Prince of Oldenburg Lyceum in St. Petersburg will be cultivating plants in parallel on the ground and conducting comparative observation of plant growth and development under gravity and zero-gravity conditions. They are receiving the photo images taken by Yuri.]*

In the FGB (Funktsionalnyi-Grusovoi Blok), the CDR did more preventive RS (Russian Segment) ventilation system maintenance, with the cleaning of the three SOTR (Thermal Control System) gas-liquid heat exchanger (GZhT4) grills not finished yesterday.

Peggy also worked on the long-term CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) incubator, first powering it off and decabling it, then accessed its interior for removing some items, inserting a new plant habitat (Silicate Garden Habitat) on its CSI-02 (CGBA Science Insert #2) base, closing the incubator, reconnecting its cabling and powering it up. *[The CGBA incubator is controlled from the ground, with automatic video downlinked to Earth.]*

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2/PFE-OUM), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Peggy then transferred the crew's exercise data file to the MEC (Medical Equipment Computer) laptop for downlinking, as well as the daily wristband HRM data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

As most every day after his arrival, when not busy with urgent Columbus commissioning work, Leo had another 60 minutes for himself for general orientation (station familiarization & acclimatization), as is standard daily rule for the first two weeks after starting station residency.

At ~8:45am EST (2:45pm in Paris), Leo Eyharts supported three interactive PAO interviews with TV/radio media in France of ~6.5 min each: TF1 French TV (Harry Roselmack), France 24 News Network (Ulysse Gosset), and Europe 1 French Radio (Alain Cirou). Questions for Leo were uplinked beforehand. *["What is life like on the station? What are the differences with Mir?"; "Tell us about the docking of Columbus, and how are the experiments going?"; "2008 is a splendid year for Europe with a number of important space missions including yours. Is there still a competition in space now or would you say it was more about cooperation?"; "Do you sleep well, and what do you dream about?"; "Your German crewmate was not well. What would happen if you were to fall ill?"]*

At ~3:00pm, the crew had their eleventh weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC-10 (Station Support Computer 10)]*.

The three station residents had their standard periodic PMC (Private Medical Conference) via S- & Ku-band audio/video.

Weekend Voluntary Science: Three optional activities for the voluntary "Saturday Science" program for next weekend (3/1, 3/2) were suggested to Peggy for her choice. Selection is required by tonight. *[The choices are: (1) InSPACE-2 – three experiment runs; (2) EPO – Careers Demo (Identify all the different steps crewmembers have taken to get to where they are today; identify all the different NASA careers that work together to prepare an astronaut for spaceflight (Objective: to motivate students to strive for a career in science, technology, engineering, and mathematics and to someday work for NASA); and (3) SWAB (Surface, Water and Air Biocharacterization) collections of air & surface samples.]*

QD Leak in Lab: Yesterday, when the crew started to demate the MTL (Moderate Temperature Loop) hose of US EXPRESS Rack 3 (ER3) in preparation for the upcoming relocation of ER3 to the Columbus Module, the QD (Quick Disconnect) leaked a small amount of coolant. The QD was immediately remated, and the leak stopped. Analysis is underway as part of ER3 relocation planning.

ISS Reboost Preview: Tomorrow night's ISS reboost with the SM main engine (2 KD thrusters & ODU props) is scheduled for shortly after midnight (00:21am EST), with a planned delta-V of (currently) 3.2 m/s. Some US systems will be powered down for the maneuver and afterwards reactivated.

SRK-V Condensate Feed Unit: Energia/Moscow is investigating an issue with the CFU (Condensate Feed Unit) of the Russian SRV-K (Condensate Water Processor) in the SM.

CEO photo targets uplinked for today were **Mount Vesuvius, Italy** *(nadir pass. Vesuvius is wooded and thus easy to detect as a darker circular area in the middle of the coastline of the Bay of Naples [just east of Naples]. Detailed imagery from low earth orbit reveals changes in topography of this active volcano. In the early 1980s an area of 80 square kilometers between the volcano and Naples was lifted up by tectonic forces, in places by 5.9 feet [1.8 meters], causing damage to houses and the harbor, and necessitating the relocation of 36,000 people. Vesuvius is famous for the catastrophic eruption in 79 A.D. that buried the towns of Herculaneum and Pompeii),* **South Tibesti Megafans, Chad** *(ISS track passed through the middle of this site. Mapping swaths left and right of track were requested. Two major rivers lead water and sediment off the southern slopes of the Tibesti Mts. In the past when central Saharan climates were wet, these now-dormant rivers flowed strongly, filling a large, permanent lake in the Lake Chad basin. In the process they created two extensive delta-like features [megafans] that have recently been recognized. Remnants of these ancient river courses may be sufficiently detailed in ISS/CEO imagery for past flow discharges to be calculated [from widths, sinuosity and other remotely sensed data]),* and **Teide Volcano, Tenerife, Canary Is.** *(ISS track passed just north of Tenerife Island. Teide Volcano forms the entire southern part of the island. Detailed images of the high, central parts were requested. This dormant volcano has recently shown signs that it might be building for another eruption. Standing 3,715 m above sea level, Teide is the third largest volcano on the planet [only the enormous volcanoes Mauna Loa and Mauna Kea are larger]. Since Tenerife Island was settled in 1402, the volcano has erupted nine times. Over the last three hundred years, eruptions have occurred every century or so, in 1706, 1798 and 1909. A new eruption in the near future may be in the offing)*.

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3QTR CY10 – STS-133/ULF5.

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From: vonPuttkamer, Jesco H. (HQ-CJ000)

To: Von Puttkamer, Jesco H. (HQ-CE010);

CC:

Subject: ISS On-Orbit Status 02/25/08

Date: Monday, February 25, 2008 12:35:31 PM

Attachments:

ISS On-Orbit Status 02/25/08

All ISS systems continue to function nominally, except those noted previously or below. *Russian Holiday: "Defender of the Fatherland Day" (Dyen' zaschitnika Otechestva),- also: Men's Day (Dyen' Muzhchin). Underway: Week 19 of Increment 16.*

Before breakfast, having reached the FD15 (Flight Day 15) mark in his flight, FE-2 Eyharts undertook his first session with the NASA/JSC experiment NUTRITION w/ Repository, today limited to two blood draws (for Serum & Heparin). *[Acting as operator and CMO (Crew Medical Officer), Peggy Whitson performed phlebotomy on Leo, i.e., drew blood samples (from an arm vein) which were first allowed to coagulate in the Repository, then spun in the HRF RC (Human Research Facility/ Refrigerated Centrifuge) and finally placed in MELFI (Minus-Eighty Laboratory Freezer for ISS). The RC was later powered off after a temperature reset to limit wear on the compressor, and cleaned. Background: NUTRITION is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight; this includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes. The Clinical Nutritional Assessment profile currently required on all U.S. Astronauts collects blood and urine samples preflight and postflight. NUTRITION expands this protocol by also capturing inflight samples and an additional postflight sample. Furthermore, additional measurements are included for samples from all sessions, including additional markers of bone metabolism, vitamin status, and hormone and oxidative stressor tests. The results will be used to better understand the impact of countermeasures (exercise and pharmaceuticals) on nutritional status and nutrient requirements. The Clinical Nutritional Assessment profile (MR016L), first started on two Mir crewmembers and then on all ISS US crews, nominally consists of two pre-flight and one post-flight analysis of nutritional status, as well as an in-flight assessment of dietary intake using the FFQ (Food Frequency Questionnaire). The current NUTRITION project expands MR016L testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow*

evaluation of post-flight nutrition and implications for rehabilitation.]

Also for Leo's FD15 mark, Dr. Whitson broke out and set up the PFE-OUM (PFE-Oxygen Uptake Measurement) equipment on the HRF-2 (Human Research Facility 2) rack, including the PFM/PAM (Pulmonary Function Module/Photoacoustic Analyzer Module), Mixing Bag System and GDS (Gas Delivery System). Data collection on Eyharts, with herself as operator, is scheduled tomorrow. *[The Periodic Fitness Evaluation with Oxygen Uptake Measurement experiment, using the CEVIS ergometer for workout, demonstrates the capability of crewmembers to perform periodic fitness evaluations with continuous oxygen consumption measurements within 14 days after arrival on ISS, and once monthly during routine PFEs. Once the capability of the pulmonary function system (PFS) to perform PFEs is verified, crewmembers will be able to integrate their monthly PFE with oxygen consumption measurements to fulfill the requirement for cardiovascular fitness evaluations during long-duration space flight.]*

On the EMCS (European Modular Cultivation System) facility, after having installed two new RBLSS (Rotor Based Life Support System) modules last week (2/21) in preparation for the upcoming Japanese CW/RW (Cell Wall/Resist Wall) experiment, the CDR today installed water tubes on the new modules. Later, the CDR also removed all cabling from EMCS in preparation for the move of ER3 (EXPRESS Rack 3) from the US Lab to the COL (Columbus Orbital Laboratory). *[The EMCS rack contains a rotating centrifuge that can support a wide range of small plant and animal experiments under partial gravity conditions. One of the new RBLSS modules is on Rotor A (position EC2, RBLSS Box 1) and the other on Rotor B (position EC2, RBLSS Box 1).]*

Also for the ER3 move to COL, Whitson decabled its ELC (ER3 Laptop Computer) and stowed it along with its cables and power supply.

FE-1 Malenchenko had another 1h 20m for cargo transfer and stowage from Progress M-63/28P to the ISS. *[28P, docked at the DC1 Docking Compartment, is currently scheduled for separation on 4/7.]*

FE-2 Eyharts continued supporting the COL BLBG (Biolab Glovebox) experiment WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels), installing the first four ECs (Experiment Containers, #1-4) in the BLBG, supporting the ground-controlled sterilization of the Glovebox, preparing the ECs for operation and installing the video cassette for the first run.

The FE-1 meanwhile conducted the periodic inventory audit of 35 Russian medical kits and items located in the Service Module (SM) medical cabinet. Purpose: to verify their availability, condition and stowage locations, weed out a number of

discarded kits, replace medications in the Emergency First Aid Kit (NP-2 #A 082) with fresh supplies, and relocate/reconfigure medical kit contents.

Malenchenko also used the AK-1M adsorber and IPD-CO Draeger tubes to perform the periodic sampling of cabin air for subsequent analysis on the ground. *[Yuri started out by taking air samples in the SM and FGB and to check for leaked-out Freon in the SM, then switched to the IPD-CO Draeger tubes sampler to check for CO (carbon monoxide) in the SM.]*

Whitson conducted microbiological sampling in Columbus, taking surface samples with the SSK (Surface Sample Kit) for the first time and air samples at mid-module, using the MAS (Microbial Air Sampler) kit and the GSC (Grab Sample Container). *[Bacterial and fungal air samples are usually taken at two locations in the module being checked. The colony growth on the MAS sampling slides is analyzed after five days of incubation in four Petri dishes. For onboard visual analysis of media slides from the SSK, the crew has a procedure for visual inspection of samples for bacterial and fungal colony growths after appropriate incubation periods.]*

Later, Yuri audited Russian IPD air samplers delivered on Progress M62/27P and re-labeled their cartridge belts for identification.

Leo Eyharts continued his support of the ELITE-S2 (Elaboratore Immagini Televisive - Space 2) payload by powering up its IMU (Interface Management Unit) to allow the ground to downlink the data from his previous session (2/22) by tele-commanding. Afterwards, he turned the IMU off again. *[The Italian (ASI) experiment ELITE-S2 is a human motion analysis facility for technological characterization and potential application for multifactorial movement analysis, to study the connection between brain, visualization and motion in micro-G. By recording and analyzing the three-dimensional motion of astronauts, this study should help engineers apply ergonomics into future spacecraft designs and determine the effects of weightlessness on breathing mechanisms for long-duration missions.]*

In the FGB (Funktsionalnyi-Grusovoi Blok), the CDR and FE-1 started a new round of the periodic preventive maintenance of RS (Russian Segment) ventilation systems. Peggy cleaned the detachable VT7 fan screens 1, 2 & 3 of the three SOTR (Thermal Control System) gas-liquid heat exchangers (GZhT4) while Yuri cleaned the grille of the TsV1 ventilator.

Peggy Whitson conducted another session with the InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) experiment in the MSG (Microgravity Science Glovebox), conducting runs #34 (vial 002) to investigate a higher frequency (2.0 Hz) instead of yesterday's low frequency (0.66 Hz) which

resulted in weak fluid/particle structures. *[InSPACE obtains basic data on MR (magnetorheological) fluids, i.e., a new class of "smart materials" that can be used to improve or develop new brake systems, seat suspensions robotics, clutches, airplane landing gear, and vibration damper systems. The colloidal (dispersed) particles are contained in CAs (Coil Assemblies) in the MSG that subject them to electric fields at certain strength and frequencies. The desired strong dipolar interaction between the small colloidal particles can be achieved in micro-G simply with an external magnetic field being turned on and off. On the ground, the flow properties (rheology) of many materials, especially those making up consumer products like detergents, fabric softeners, toothpaste and paints, are similarly controlled, though not by magnetic fields but by adding a polymer. It now appears, for example, that new formulations of fabric softeners may perform better in space than on earth.]*

It was Malenchenko's turn today for the mandatory 30-min. medical CBT (Computer-based Training) contingency drill, with video & text material, to refresh his CMO proficiency/rating. Peggy and Leo completed theirs on 2/21. *[To maintain proficiency in using HMS (health maintenance systems) hardware, today's training focused on Part 2 of the regular exercise, viz., a review of Nasal Airway, Suction Device, ILMA (Intubating Laryngeal Mask Airway) with endotracheal tube, and Cricothyrotomy (incision to re-enable breathing air inflow).]*

In the Soyuz 15S spacecraft, docked at the FGB nadir port, Malenchenko turned on the gas analyzer, a periodic 48-hr. checkup activity.

The FE-1 completed the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Yuri also performed the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

In addition, working from the Russian voluntary "time permitting" task list, the Russian flight engineer --

- Conducted the regular checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder) *[This is a daily monitoring/temp checking, carried on the Russian voluntary task list for the duration of Expedition 16];* and

- Performed the daily monitoring, picture-taking and downloading on the BIO-5 Rasteniya-2 ("Plants-2") experiment. Today's task was extended to include recharging the water tank of the greenhouse. *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/ video recording. During the duration of the BIO-5 experiment, students of the Moscow City Palace for Youth Creativity of the Meshchansky inter-regional center #15 in Moscow) and the Prince of Oldenburg Lyceum in St. Petersburg will be cultivating plants in parallel on the ground and conducting comparative observation of plant growth and development under gravity and zero-gravity conditions. They are receiving the photo images taken by Yuri.]*

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1, FE-2).

Peggy Whitson then transferred the crew's exercise data file to the MEC (Medical Equipment Computer) laptop for downlinking, as well as the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

As most every day after his arrival, when not busy with urgent Columbus commissioning work, Leo had 60 minutes for himself for general orientation (station familiarization & acclimatization), as is standard daily rule for the first two weeks after starting station residency.

At ~9:37am, FE-2 Eyharts powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, and power supply) and at 9:42am conducted a ham radio exchange with students at College Reydellet, Saint-Denis, Ile de La Réunion. *[Saint-Denis is the administrative capital of the French overseas department of Réunion Island, in the Indian Ocean. The city counts 130,000 inhabitants. Jules Reydellet College collaborated in the making of SPUTNIK 40 (RS17), and students contacted Viktor Afanasyev on MIR from TsUP-Moscow in September 1999. The College welcomed Victor Poliakov and Pavel Vinogradov who threw a spaceship model from MIR, and also cosmonauts Jean-Loup Chrétien, Jean-Pierre Haigneré and Claudie Haigneré. The exchange was conducted in French.]*

RPC Trip: Yesterday, RPC 03 (Remote Power Controller 03) in RPCM (RPC

Module) LA2B_G tripped due to an overcurrent, as a subsequent data dump showed. The RPC powers the MTL RFCA (Moderate Temperature Loop Rack Flow Control Assembly) in Node-1, used to provide more MTL flow to the US Airlock depress pump during EVAs. Formulation of a plan for troubleshooting and possibly R&R (Removal & Replacement) is underway.

No CEO (Crew Earth Observation) photo targets uplinked for today.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 7:49am EST [= epoch]):
Mean altitude -- 337.5 km
Apogee height -- 342.8 km
Perigee height -- 332.3 km
Period -- 91.28 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007797
Solar Beta Angle -- -59.6 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 58 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53075

Significant Events Ahead *(all dates Eastern Standard, some changes possible.):*
02/28/08 -- ISS Reboost w/IWIS, SDMS
03/07/08 -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana) (~11:23pm EST); docking 04/03
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/12/08 -- ATV CAM (Collision Avoidance Maneuver) demo
03/13/08 -- STS-123/Endeavour/1J/A docking
03/18/08 -- ATV1 parking orbit (loiter)
03/25/08 -- STS-123/Endeavour/1J/A undocking
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)

04/19/08 -- Soyuz TMA-11/15S undocking/landing (FGB nadir port)
05/10/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08 -- ATV1 undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/24/08
Date:	Sunday, February 24, 2008 1:02:13 PM
Attachments:	

ISS On-Orbit Status 02/24/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday -- off-duty day for CDR Whitson, FE-1 Malenchenko & FE-2 Eyharts. Ahead: Week 19 of Increment 16.*

For today's Voluntary Science program, Peggy Whitson continued her work with the InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) experiment in the MSG (Microgravity Science Glovebox), conducting runs #31, #32 and #33 to investigate low frequency behavior (0.66 Hz) at the highest particle concentration MR (magnetorheological) fluid, exchanging video tapes after each run, then removing the vial assembly and finally powering the MSG down. *[InSPACE obtains basic data on MR fluids, i.e., a new class of "smart materials" that can be used to improve or develop new brake systems, seat suspensions robotics, clutches, airplane landing gear, and vibration damper systems. The colloidal (dispersed) particles are contained in CAs (Coil Assemblies) in the MSG that subject them to electric fields at certain strength and frequencies. The desired strong dipolar interaction between the small colloidal particles can be achieved in micro-G simply with an external magnetic field being turned on and off. On the ground, the flow properties (rheology) of many materials, especially those making up consumer products like detergents, fabric softeners, toothpaste and paints, are similarly controlled, though not by magnetic fields but by adding a polymer. It now appears, for example, that new formulations of fabric softeners may perform better in space than on earth.]*

During the InSPACE runs, Peggy took time for the periodic deployment of two passive FMK (Formaldehyde Monitoring Kit) sampling assemblies in the Lab (below CEVIS) and SM (Service Module, most forward handrail) for two days, to catch any atmospheric formaldehyde (H_2CO, methanal) on a collector substrate for subsequent analysis on the ground. *[Formaldehyde is an intermediate in the oxidation (combustion) of methane and other carbon compounds, e.g., forest fires,*

in automobile exhaust, and in tobacco smoke. Small amounts of formaldehyde are produced as a metabolic byproduct in most organisms, including humans.]

FE-1 Malenchenko completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables plus the weekly collection of the toilet flush counter (SPK-U) and water supply (SVO) readings for calldown to TsUP/Moscow.

Yuri also gathered weekly data on total operating time and "On" durations of the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem for reporting to TsUP.

In the US Lab, FE-2 Eyharts set up the hardware associated with urine and blood collections for NASA's NUTRITION/Repository experiment. *[To gain more time for Leo's planned work on the COL FSL (Columbus Orbital Laboratory/Fluid Science Laboratory) facility, his start with NUTRITION may be scheduled as early as tomorrow morning. The NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

Working from the Russian voluntary "time permitting" task list, Yuri Malenchenko today --

- Completed his seventh run of the Russian DZZ-2 "Diatomeya" ocean observations program, using the Japanese HDV (High Definition) video camera for nocturnal observations of the ocean to detect and record bio-luminescent glow of high-production water areas *[Uplinked target zones in the Pacific Ocean were the Eastern coast of New Zealand, above the Eastern Pacific Upwelling, and in the Indian Ocean the geographical area above the West Indian underwater ridge and the Great Australian Bight)];*
- Performed a session of the Russian GFI-8 "Uragan" (hurricane) earth-imaging program, using the Nikon D2X digital camera with 800 mm focal length lens *[Uplinked targets for today were pollution in the Caspian Sea, a general view of the Aral Sea, and the Pyrenees mountains (from DC1 window)],* and
- Conducted the regular checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder) *[This is a daily monitoring/temp checking, carried on*

the Russian voluntary task list for the duration of Expedition 16].

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR) and VELO bike with bungee cord load trainer (FE-1).

Eyharts and Whitson had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-9 laptop), Leo at ~11:15am, Peggy at ~12:50pm EST.

CDRA Troubleshooting Update: After Whitson's work, with the ground, on CDRA (Carbon Dioxide Removal Assembly) troubleshooting over the past two days, CDRA was activated yesterday and is functional. However, the system still exhibits the same signature of an elevated differential pressure (dP) over the Precooler during Half-Cycle 1, although the troubleshooting cleared several suspected causes. CDRA was deactivated again today by ground commanding (~7:00am-12:00pm), and analysis continues.

RSE1 Laptop Upgrade Update: On 2/22, Yuri Malenchenko's attempt to upgrade the Russian laptop RSE1 with a new software application for ATV (Automated Transfer Vehicle) docking simulations, from a DVD on the RSS1 laptop, was aborted after the procedure failed, probably due to incompatibility of the old RSS1 software with the new load. After restoring RSS1 functionality with a spare hard drive, TsUP-Moscow was considering repeating the ATV OBT (Onboard Training) software load on 2/27 (Wednesday).

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05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/23/08
Date:	Saturday, February 23, 2008 2:08:39 PM
Attachments:	

ISS On-Orbit Status 02/23/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday -- off-duty day for CDR Whitson, FE-1 Malenchenko & FE-2 Eyharts except for housekeeping and voluntary work.*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the Service Module (SM) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the CDR's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

CDR Whitson prepared the MELFI (Minus Eighty Degree Laboratory Freezer for the ISS) for the next DCB (Double Cold Bag) sample stow activity, first swapping box modules in Dewar 3 trays A & B, then inserting 16 -32deg ICEPAC belts in Dewar 3 *[The MELFI dewar is currently powered off, i.e., at ambient temperature, so Peggy did not have to hurry through the normal 60 sec time "window" after its opening.]*

The CDR reconfigured the auto-rebooted PCS (Portable Computer System) laptops in COL (Columbus Orbital Laboratory), Lab and SM for use after the new R5 software patch uplink by the ground. Later in the day, she powered down the currently not needed Cupola and Airlock PCS laptops.

Peggy also finished up her assistance to ground specialists in troubleshooting the CDRA (Carbon Dioxide Removal Assembly) which had exhibited an unexpected differential pressure (dP) offset between half cycle 1 and half cycle 2 operations. *[The troubleshooting, begun yesterday, involves inspecting and cleaning CDRA locations that could contribute to the dP anomaly at five locations that are accessible from the front of the rack and one area that requires removal of the*

TCCS (Trace Contaminant Control System) and use of the ULD (Ultrasonic Leak Detector). Yesterday Whitson experienced difficulties with the onboard fiber scope tool required for inspecting the AD/DES #2 (Absorbent/Desorbent Bed #2), resulting in deferral of about one hour of troubleshooting to today. Ground controllers plan to activate CDRA after dP troubleshooting is complete.]

The FE-1 completed the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM.

Also, working from the Russian voluntary "time permitting" task list, Yuri Malenchenko --

- Completed another radiation data monitoring & logging session for flow & dose power data with the Matryoshka-R radiation payload and its LULIN-5 electronics box *[accumulated readings were recorded on a log sheet for subsequent downlink to TsUP/Moscow via the BSR-TM payload data channel],*
- Conducted the regular checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder) *[this is a daily monitoring/temp checking, carried on the Russian voluntary task list for the duration of Expedition 16],*
- Performed a session of the Russian "Uragan" (hurricane) earth-imaging program, using the Nikon D2X digital camera with 800 mm focal length lens *[targets uplinked for today were the Western slopes of Carpathian mountains, Aral Sea and a dust storm (if present), the Kerch Strait area, the Main Caucasus mountain range (Elbrus volcano, Kazbek volcano), oil slicks in the Caspian Sea, the Pyrenees mountains(series of snapshots along the ridge)]*, and
- Completed another KPT-3 session to make observations and take aerial KPT-3 photography of environmental conditions for Russia's Environmental Safety Agency (ECON) using the Nikon D2X digital camera with SIGMA 300-800mm telephoto lens.

Two new jobs added to Peggy Whitson's voluntary "job jar" task list concern preparations for 1J/A EVAs, viz., (1) configuring some foam brushes and the tile sample bag, and (2) EMU resizing for 1J/A (also hard-scheduled next Wednesday).

At ~5:55am EST, Peggy & Leo held the (now) regular weekly audio tagup with ESA's Col-CC (Columbus Control Center) in Oberpfaffenhofen near Munich/ Germany. *[S/G-2 (Space-to-Ground 2) phone patch via SSC-10 (Station Support Computer 10)]*.

At ~7:40am, Yuri Malenchenko had his weekly PFC (Private Family Conference) via

S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-9 laptop).

At ~9:15am, the crew held its regular weekly planning conference (WPC) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP/Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

MSS Software Transition Update: Last night, ground controllers successfully completed uplink and checkout of the Robotics MSS (Mobile Service System) R5 software to the Prime C&C MDM (Command & Control Multiplexer/Demultiplexer computer). *[This software update is required to incorporate Dextre/SPDM (Special Purpose Dexterous Manipulator) functionality into the MSS. In addition, there were a few updates to the SSRMS (Space Station Remote Manipulator System) and MBS (Mobile Base System) behavior as well as new SPDM PCS displays. The crew's next Robotics operations will occur on the new MSS R5 software. In prep for that, the ground will uplink a brief summary of system behavior changes for the DOUG (Dynamic Onboard Ubiquitous Graphics) software review for those ops.]*

Columbus Update: Columbus systems continue to operate nominally.

Weekly Science Update (Expedition Sixteen -- Week 18)

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Radiation measurements continue to be performed in the PIRS module. Memory card exchange has been successfully performed on 2/15.

ANITA: Completed.

BCAT-3 (Binary Colloidal Alloy Test 3): The ground is presently working to schedule an activity to get the orientation of the stowed sample module rotated. This is to reduce the possibility of a bubble migrating through some of the samples when they are being stowed and equilibrating for six months. The stowage procedure is being updated to reflect this desire for future operations.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Reserve.

CFE (Capillary Flow Experiment): Reserve.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): In progress.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): Third session successfully performed on 2/14.

EuTEF (European Technology Exposure Facility): EuTEF has been successfully installed on COL External Platform during EVA-3 on 2/15 (FD9). During Week#18, 9 out of 9 instruments have been progressively checked out from ground with success. Two instruments (PLEGPAY and EXPOSE-E) have already been fully commissioned. At EuTEF platform level, troubleshooting is underway on some software issues with the DHPU MMU (Data Handling & Power Unit Mass Memory Unit), so that scripts can be loaded to operate the EuTEF platform in an automated way. The full commissioning of the remaining instruments will continue during Week #19 and the science program will begin during Week #20.

GEOFLOW: Hardware launched on 1E. The FSL (Fluid Science Laboratory) facility commissioning continues for a couple of days by Leo Eyharts, and it is currently planned to start the GEOFLOW science program during Week #20.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): In progress.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): Completed 30 runs since the start of InSPACE-2. Three runs were completed on 2/19 which were performed nominally. These runs explored the low frequency response of the fluid. A progression to much larger structures with increasing field strength was observed. The final structures at the end of the last run exhibited large field distortion effects when it pulsed.

Integrated Immune: Peggy's and Leo's participation in the STS-122 (1E) Integrated Immune session is appreciated!

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Troubleshooting of the centrifuge/ incubator was performed successfully on 2/15 and 2/16. The test demonstrated that the temperature can be set between +37degC and +6degC, and the KUBIK-

FM3 is fully functional. Telemetry has been downlinked and is under analysis by the KUBIK Payload Developer (PD).

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Complete.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 “Pirs”.

MULTIGEN-1: MULTIGEN-1 samples have been downloaded on STS-122 (1E) and will now be analyzed on the ground..

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION/REPOSITORY: In progress..

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): The ground appreciates Peggy’s completion of the download/initialization activity off the task list. Her remaining scheduled activities include monthly downloads, two more weeks of sleep logging, and doffing the Actiwatch. Also appreciated is the additional sleep logging. “Peggy, you continue to go above and beyond and the PI greatly appreciates it.”

SOLAR (Solar Monitoring Observatory): SOLAR has been successfully installed on COL External Platform during EVA-3 on 2/15 (FD9). Some software glitches have been repeatedly encountered with the Sun Pointing Device platform, and are currently under investigation. Some anomalies have also been encountered with a sub-system of the SOVIM instrument, which had to be power cycled. The SOLAR instruments are currently outgassing (nominal activity), before the science program is started.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): In progress.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: In progress.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): WAICO#1 hardware launched on 1E. WAICO#1 items (ATCS with chemicals, Cultivation Box Bowls with Agar) transferred to MELFI on 2/10 (FD4). Two transfer activities of 2 x 4 WAICO-#1 Seeds containers to MELFI have been performed on 2/11 to start Arabidopsis seeds vernalization phase. The BIOLAB commissioning is nearing completion. The transfer of cold stowed items from MELFI to BIOLAB was completed yesterday (2/22), and WAICO#1 experiment is currently planned to start on 02/26.

CEO (Crew Earth Observation): Ongoing.

CEO photo targets uplinked for today were **Dhaka, Bangladesh** *(the population of greater Dhaka, the Bangladeshi capital, is 11 million, making it the 11th largest city on Earth. Images of the margins of the city are requested. The city can be hard to identify: the crew was to start looking right as ISS passed over the very wide Brahmaputra River on the India-Bangladesh border. Then they were to look on a branch river nearer track than the Brahmaputra),* **Ganges River Delta** *(fast change of river course location and island shape typify this major world delta. Requested was a mapping swath of overlapping images aimed right of track. An extreme example of fast change was the sudden appearance offshore of New Moore Island [3.5 km long] in 1970. The island appeared immediately after the storm surge and floods generated by Cyclone Bhola in November 1970. This cyclone, although only a category 3 storm, was the most destructive on record. It caused the movement of vast amounts of sediment. The island continues to grow),* and **East Haruj Megafans, Libya** *(ISS passed over the center of this remote Saharan target. A mapping swath taken near nadir was requested. The almost featureless desert landforms of these "desert flats" have been recently recognized as vast spreads of river sediment [megafans]. The sediment has been transported hundreds of km from the Tibesti Mts. far to the south. Now-dry river courses can be traced from the mountains. These rivers undoubtedly flowed during wet climate phases in the past.)*

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 8:30am EST [= epoch]):
Mean altitude -- 337.7 km
Apogee height -- 343.0 km
Perigee height -- 332.3 km
Period -- 91.29 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007958
Solar Beta Angle -- -61.4 deg (magnitude peaking)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 66 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53044

Significant Events Ahead *(all dates Eastern Standard, some changes possible.):*
02/28/08 -- ISS Reboost w/IWIS, SDMS
03/07/08 -- ATV-1 “Jules Verne” launch/Ariane V (Kourou, French Guyana) (~11:23pm EST); docking 04/03
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/12/08 -- ATV CAM (Collision Avoidance Maneuver) demo
03/13/08 -- STS-123/Endeavour/1J/A docking
03/18/08 -- ATV1 parking orbit (loiter)
03/25/08 -- STS-123/Endeavour/1J/A undocking
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**

10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/22/08
Date:	Friday, February 22, 2008 3:24:35 PM
Attachments:	

ISS On-Orbit Status 02/22/08

All ISS systems continue to function nominally, except those noted previously or below.

Upon wakeup, FE-1 Yuri Malenchenko terminated his tenth MBI-12 SONOKARD experiment session, started last night, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

Before breakfast, CDR Whitson, FE-1 Malenchenko and FE-2 Eyharts started the day with the periodic session of the Russian biomedical routine assessments PZEh-MO-7/Calf Volume Measurement and PZEh-MO-8/Body Mass Measurement (fourth for CDR & FE-1, first for FE-2), using the IM mass measurement device which Yuri Malenchenko afterwards broke down for stowage. *[Calf measurements (left leg only) are taken with the IZOG device, a custom-sewn fabric cuff that fits over the calf, using the knee and lower foot as fixed reference pints, to provide a rough index of deconditioning in zero-G and effectiveness of countermeasures. For determining body mass in zero-G, where things are weightless but not massless, the Russian IM "scales" measure the inertial forces that arise during the oscillatory motion of a mass driven by two helical metering springs with known spring constants. By measuring the time period of each oscillation of the unknown mass (the crewmember) and comparing it to the period of a known mass, the crewmember's mass is calculated by the computer and displayed.]*

Malenchenko serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out" cycle to vacuum on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process will be terminated at ~4:15pm EST. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. Filter bed 1 was regenerated yesterday.]*

The FE-1 also started charging the SONY HRV-Z1J camcorder battery and ~2.5 hrs later terminated the process without dismantling the setup.

For today and Sunday (2/24), Peggy Whitson's work schedule includes shooting some "Life inboard the ISS" footage with the camcorder for use on Russian television. *[For today's filming, TsUP-Moscow's suggestion was to film Yuri Malenchenko while working with the Matryoshka radiation detectors and the filling of the Elektron EDV container with US condensate water (see below). Other scenes of interest to TV viewers would include crewmembers washing their faces, brushing their teeth, exercising, cooking meals, conducting science research and servicing life support systems. The downlinking of the recorded footage is scheduled next week (2/26 & 2/27).]*

CDR Whitson supported FE-2 Eyharts' activities with the ELITE-S2 (Elaboratore Immagini Televisive - Space 2) payload by moving the CEVIS (Cycle Ergometer with Vibration Isolation) out of the field of view of the cameras crucial to of the experiment, which she then set up for capturing Leo's Eyharts' movement protocol. After powering up the IMU (Interface Management Unit) and calibrating the work area for the cameras, the FE-2 had ~1.5 hrs to perform the test operations while Whitson took documentary photographs and later stowed the test camera. *[The Italian (ASI) experiment ELITE-S2 is a human motion analysis facility for technological characterization and potential application for multifactorial movement analysis, to study the connection between brain, visualization and motion in micro-G. By recording and analyzing the three-dimensional motion of astronauts, this study should help engineers apply ergonomics into future spacecraft designs and determine the effects of weightlessness on breathing mechanisms for long-duration missions. For each of three planned protocols, a set of body landmarks are identified and reflective markers are applied on the subject who then performs prescheduled movements with the index finger tips then returns to the initial position (for example, the subject has to reach and brush, without exerting forces). The video cameras trace the trajectories of the body parts of the astronaut catching the light reflected by the markers, thus recording the kinetic and trajectory data of the movement.]*

Yuri Malenchenko set up new Bubble dosimeters for recording radiation traces as

an additional component of the RS (Russian Segment) radiation payload suite "Matryoshka-R" (RBO-3-2), initializing and deploying the detectors. *[A total of seven Bubble dosimeter detectors (A01-A08, A05 not used) were initialized in the Bubble dosimeter reader in the Service Module (SM) and positioned at their exposure locations, three near the "Phantom" unit on the DC1 panel and four in the SM starboard crew cabin on both sides of the MOSFET (metal oxide semiconductor field-effect transistor) dosimeter detector unit. The setup was photo-documented with the NIKON D2X camera and also reported to TsUP via log sheet on the BSR-TM payload channel. The complex Matryoshka payload suite is designed for sophisticated radiation studies. Note: Matryoshka is the name for the traditional Russian set of nested dolls.]*

The FE-1 spent ~1.5 hrs on the TVIS treadmill for the periodic Russian PZE-MO-3 test for physical fitness evaluation, his second time, using the TVIS in unmotorized (manual control) mode and wearing the Kardiokassette KK-2000 belt with three chest electrodes. *[The fitness test, controlled from the RSE-Med laptop, yields ECG (electrocardiogram) readings to the KK-2000 data storage device, later downlinked via the BSR-TM payload telemetry channel. Before the run, the KK-2000 was synchronized with the computer date/time readings. For the ECG, the crewmembers worked out on the treadmill, first walking 3 min. up to 3.5 km/h, then running at a medium pace of 6.5 km/h, followed by the maximum pace not exceeding 10 km/h, then walking again at gradually decreasing pace.]*

In the COL (Columbus Orbital Laboratory), Leo Eyharts worked on the BLB (Biolab), first deinstalling and removing all hardware items required earlier for BLB and BLB-Incubator commissioning, then installing a new video tape and the hardware for the subsequent operation of the WAICO (Waving and Coiling of Arabidopsis Roots at Different g-levels) experiment, including 1 ATCS (Automatic Temperature Controlled Stowage) unit and 16 seed containers stored in the MELFI (Minus Eighty Degree Laboratory Freezer for the International Space Station) on 2/10. *[WAICO, contributed by Leibniz Universität in Hannover, Germany, is a small greenhouse for studying the interaction of circumnutation (the successive bowing or bending in different directions of the growing tip of the stems and roots) and gravitropism (a tendency to grow toward or away from gravity) in microgravity and 1-g of* Arabidopsis thaliana *(commonly known as thale cress).]*

In the US Lab, Whitson performed troubleshooting on the CDRA (Carbon Dioxide Removal Assembly), after connecting the regular ITCS LTL (Internal Thermal Control System/Low Temperature Loop) coolant jumper at the LAB1D6 rack for the ground-commanded activation of CDRA later (12:10p-2:00pm). *[For the troubleshooting, Peggy first used a fiber optics tool to inspect the AD/DES #2 (Absorbent/Desorbent Bed #2), then removed the TCCS (Trace Contaminant*

Control Subassembly) and used the ULD (Ultrasonic Leak Detector) to sample and inspect Ad/DES #2.]

FE-1 Malenchenko upgraded the Russian laptop RSE1 with a software application from a DVD and the RSS1 laptop that enables it to support a planned ATV (Automated Transfer Vehicle) docking simulation for an upcoming docking OBT (On-Board Training).

Using the SKDS CMS (Pressure Control & Atmosphere Monitoring System/ Countermeasure System), Yuri took the periodic readings of potentially harmful contaminants in the SM. The hardware was then returned to initial stowage. *[The CMS uses preprogrammed microchips to measure Formaldehyde (H_2CO, methanal), Carbon Monoxide (CO) and Ammonia (NH_3), taking one measurement per microchip.]*

Peggy gathered measurements for the periodic (weekly) atmospheric status check for ppO_2 (Partial Pressure Oxygen) and $ppCO_2$ (pp Carbon Dioxide), using the hand-held CSA-CP (Compound Specific Analyzer-Combustion Products), CSA-O_2 (CSA -Oxygen sensor) and CDMK (CO_2 Monitoring Kit). Batteries were to be replaced if necessary. *[Purpose of the 15-min activity is to trend with MCA (Major Constituents Analyzer), i.e., to correlate the hand-held readings with MCA measurements. CSA-CP sensors (and readings) employed in the SM were #1051 (20.7%) & #1044/prime (20.9%); in Node-1 #1058 (19.6%); and in Node-2 #1045 (20.6%). O_2 sensor checks used #1052 (21.5%), #1041 (21.6%). CDMK CO_2 level in Lab was 0.43 and in SM ~0.42%.]*

Malenchenko completed the periodic (about twice a month) replenishing of the Elektron's water supply for electrolysis, filling the KOV thermal loops' EDV container with purified water from CWC (Contingency Water Container, #1043) collected by the US CCAA (Common Cabin Air Assembly). *[The 40-minute procedure is specially designed to prevent air bubbles larger than ~10 mm from getting into the BZh Liquid Unit where they could cause Elektron micropump shutdown.]*

The FE-1 completed the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM.

Also, working from the Russian voluntary "time permitting" task list, Malenchenko -

- Performed the periodic downloading of accumulated log files from the Russian BSMM (Payload Matching Unit/computer) to the US OCA for downlink,

- Completed the daily IMS maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/ import to its three databases on the ground (Houston, Moscow, Baikonur),
- Conducted the regular checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder) *[This is a daily monitoring/temp checking, carried on the Russian voluntary task list for the duration of Expedition 16],* and
- Performed the daily monitoring, picture-taking and downloading on the BIO-5 Rasteniya-2 ("Plants-2") experiment. *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP)].*

For Peggy Whitson and Leo Eyharts, a new item added to the discretionary US “job jar” task list is to recover the functionality of the SSC-2 (Station Support Computer 2) laptop. *[Steps include removing & stowing its current CPSD (Crew Personal Support Disk) hard drive #1148, replacing it with a second hard drive (#1185), reconnecting the A31p client to the Ethernet cable and reloading the hard drive from a backup DVD, then re-registering the client on the OpsLAN (Operations Local Area Network).]*

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1/MO-3, FE-2), RED resistive exercise device (CDR) and VELO bike with bungee cord load trainer (FE-1).

Peggy then transferred the crew’s exercise data file to the MEC (Medical Equipment Computer) laptop for downlinking, as well as the daily wristband HRM data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~3:25am EST, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~8:55am, Peggy, Yuri and Leo conducted their standard bi-weekly teleconference with the JSC Astronaut Office (Steve Lindsey), via S-band S/G-2 audio & phone patch.

At ~3:55pm, the crew will have their tenth weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC-10 (Station Support Computer 10)]*.

MSS Software Transition: MCC-Houston has started the multi-hour transition of onboard computers to the new CDH (Command & Data Handling) software version R5 for the Robotics MSS (Mobile Service System) and SSRMS (Space Station Remote Manipulator System). *[The procedure began at ~7:00am on the Prime C&C MDM (Command & Control Multiplexer/Demultiplexer computer), after first deleting the old MSS R3 software. After an initial checkout, ground specialists will tomorrow load a patch (PPL/Prepositioned Load) to all PCS (Portable Computer System) laptops to add the Robotics displays that go with R5, then repeat the file uplinks to the Backup & Standby C&C MDMs as well as the MSD (Mass Storage Device), followed by the remaining patches to the other PCS laptops.]*

COL Update: Columbus systems continue to operate nominally.

WDS Update: An updated Water Delivery System "cue card" was uplinked for the crew's reference. *[The new card (16-0018U) lists 36 CWCs (~1392.5 L total) for the four types of water identified on board: technical water (812.9 L, for Elektron, flushing, hygiene), potable water (559.6 L), condensate water (20 L), waste/EMU dump and other (0 L). Of the 36 containers, nine CWCs with technical water (388.9 L) cannot be used until cleared for* Wautersia *bacteria, and 10 CWCs with potable water (427 L), transferred from Atlantis, are not cleared for use pending analysis of samples returning on 1E.]*

CEO photo targets uplinked for today were **Northern Temperate Lakes, Wisconsin** *(looking right or east of ISS track for lakes in this LTER [Long Term Ecological Research] site. The North Temperate Lakes Research program aims to understand the ecology of lakes in relation to relevant atmospheric, geochemical, landscape and human processes. The overarching research question is "How do biophysical setting, climate, and changing land use and cover interact to shape lake characteristics and dynamics over time [past, present, future]?" Documenting land use around the lake as well as lake levels and colors),* and **West Hawk Impact Crater** *(looking right or east of ISS orbital track for this Canadian lake formed by an impact crater. West Hawk Lake was formed approximately 351 million years ago. It is 2.4 kilometers in diameter. West Hawk Lake is also the deepest lake in Manitoba [115m].)*

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 8:08am EST [= epoch]):
Mean altitude -- 337.7 km
Apogee height -- 343.0 km
Perigee height -- 332.4 km
Period -- 91.29 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007872
Solar Beta Angle -- -60.6 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Revolutions since FGB/Zarya launch (Nov. 98) -- 53028

Significant Events Ahead *(all dates Eastern Standard, some changes possible.):*
02/28/08 -- ISS Reboost w/IWIS, SDMS
03/07/08 -- ATV-1 “Jules Verne” launch/Ariane V (Kourou, French Guyana) (~11:23pm EST); docking 04/03
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/12/08 -- ATV CAM (Collision Avoidance Maneuver) demo
03/13/08 -- STS-123/Endeavour/1J/A docking
03/18/08 -- ATV1 parking orbit (loiter)
03/25/08 -- STS-123/Endeavour/1J/A undocking
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 -- STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)

10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
1QTR CY09 -- STS-127/2J/A launch - JEM EF, ELM-ES, ICC-VLD
2QTR CY09 -- STS-128/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
3QTR CY09 -- STS-129/ULF3 - ELC1, ELC2
4QTR CY09 -- STS-130/19A - MPLM
1QTR CY10 – STS-131/ULF4
2QTR CY10 -- STS-132/20A – Node-3 + Cupola
3QTR CY10 – STS-133/ULF5.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/21/08
Date:	Thursday, February 21, 2008 12:54:40 PM
Attachments:	

ISS On-Orbit Status 02/21/08

All ISS systems continue to function nominally, except those noted previously or below.

FE-1 Malenchenko performed the periodic servicing of the Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The regen process will be terminated before sleeptime, at ~2:15pm EST. Regeneration of bed #2 follows tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods.]*

CDR Whitson and FE-2 Eyharts completed the mandatory 30-min. medical CBT (Computer-based Training) contingency drill, with video & text material, to refresh their CMO (Crew Medical Officer) proficiency/rating. *[To maintain proficiency in using HMS (health maintenance systems) hardware, today's training focused on Part 2 of the regular exercise, viz., a review of Nasal Airway, Suction Device, ILMA (Intubating Laryngeal Mask Airway) with endotracheal tube, and Cricothyrotomy (incision to re-enable breathing air inflow).]*

FE-1 Malenchenko worked in the Soyuz TMA-11/15S vehicle, docked at the FGB nadir port, dismantling the KURS-A rendezvous and approach radar system of its SUDN motion control & navigation system and removing it from the Orbit Module (to be jettisoned prior to reentry), a 3.5-hour job including logging it in the IMS (Inventory Management System). These valuable components will be returned to Earth on the Shuttle for reuse. *[KURS, not required for Soyuz reentry or prox ops (relocation), has two components: KURS-A is the active half of the Russian space program's proven S-band radar system for automated flight, which measures relative motion parameters between Soyuz(or Progress) and the ISS during rendezvous operations, to enable the autopilot's calculation of corrective impulses. The system's passive transponder counterpart (KURS-P) is on the Service Module (SM), with one antenna each at the tip of the two solar array wings.]*

Leo continued preparing the ELITE-S2 (Elaboratore Immagini Televisive - Space 2) hardware for operation, connecting camera cables to its IMU (Interface Management Unit) and routing them in the Lab, then activating the ELC (EXPRESS Laptop Computer) and installing the ELITE-S2 Remote Desktop Client software from CD. *[The Italian (ASI) experiment ELITE-S2 is a human motion analysis facility for technological characterization and potential application for multifactorial movement analysis, to study the connection between brain, visualization and motion in micro-G. By recording and analyzing the three-dimensional motion of astronauts, this study should help engineers apply ergonomics into future spacecraft designs and determine the effects of weightlessness on breathing mechanisms for long-duration missions.]*

Peggy Whitson performed clean-up operations on the EMCS (European Modular Cultivation System) facility, exchanging a number of EMCS modules in preparation for the upcoming CW/RW (Cell Wall/Resist Wall) experiment. *[The EMCS rack contains a rotating centrifuge that can support a wide range of small plant and animal experiments under partial gravity conditions.]*

The CDR also conducted the periodic check of active U.S. payloads, viz., cleaning the ANITA (Analyzing Interferometer for Ambient Air) inlet plus inspecting and filter cleaning of the CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) incubator payload. *[The CGBA incubator is controlled from the ground, with automatic video downlinked to Earth. ANITA continues to collect data every six seconds and downlinks the data daily to the ground team. ANITA monitors low levels of potential gaseous contaminants in the ISS cabin atmosphere with a capability of simultaneously monitoring 32 gaseous contaminants. The experiment is testing the accuracy and reliability of this technology as a potential next-generation atmosphere trace-gas monitoring system for ISS and future spacecraft. This is a collaborative investigation with ESA.]*

Continuing his COL (Columbus Orbital Laboratory) commissioning work, Leo Eyharts set up hardware in the FSL (Fluid Science Laboratory), specifically the upper section of the CEM (Central Experiment Module), including removing launch fixation bolts and installing some ORUs (Orbital Replacement Units),

In Node-2, Whitson installed and configured an SSC (Station Support Computer) A31p laptop as SSCR (Station-to-Shuttle Communications Router), loading it with the necessary image software (V.4.0) and connecting it to the ISL UIP (Integrated Station LAN Utility Interface Panel). *[The SSCR will enable wireless connectivity between the Shuttle and Station LANs (Local Area Networks) during a flight, which will allow the Shuttle to shut down its own Ku-band to help save fuel cell cryo. During the 1J/A mission, the laptop will be powered up again, and the ground will verify that everything works OK with the Shuttle network.]*

The CDR also continued troubleshooting & cable connectivity checkout of the PS28 (Powerstrip 28) junction box with Part 2 of the uplinked procedures.

Later, Peggy conducted the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week. The current cue card (#16-0018T), to be updated with today's d data, lists 36 CWCs (~1295.1 L total) for the four types of water identified on board: technical water (695.3 L, for Elektron, flushing, hygiene), potable water (559.5 L), condensate water (40.2 l), waste/EMU dump and other (0 L). Of the 36 containers, nine CWCs with technical water (251.1 L) cannot be used until cleared for* Wautersia *bacteria, and 10 CWCs with potable water (427 L), transferred from Atlantis, are not cleared for use pending analysis of samples returning on 1E.]*

Regular servicing & maintenance tasks completed by Yuri Malenchenko today included –

- Linking up with TsUP-Moscow stowage specialists at ~3:05am EST via S-band to conduct the weekly IMS (Inventory Management System) tagup, discussing stowage issues and equipment locations,
- The periodic checkout/verification of IP-1 airflow sensors in the various RS (Russian segment) hatch openings (8) in the SM, FGB and DC1 (Docking Compartment),
- The monthly maintenance on the Russian IK0501 GA (gas analyzer) of the SOGS Pressure Control & Atmospheric Monitoring System, adjusting for O_2 readings *[IK0501 is an automated system for measuring CO_2, O_2, and H_2O in the air as well as the flow rate of the gas being analyzed],*
- The daily monitoring, picture-taking and downloading on the BIO-5 Rasteniya-2 ("Plants-2") experiment. *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP)], and*
- Completing the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM.

Also, working from the Russian voluntary "time permitting" task list, Yuri was to -

- Perform the periodic downloading of accumulated log files from the Russian BSMM (Payload Matching Unit/computer) to the US OCA for downlink,
- Complete the daily IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/ import to its three databases on the ground (Houston, Moscow, Baikonur), and

- Conduct the regular checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder). *[This is a daily monitoring/temp checking, carried on the Russian voluntary task list for the duration of Expedition 16.]*

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1, FE-2).

Peggy then transferred the crew's exercise data file to the MEC laptop for downlinking, as well as the daily wristband HRM data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Shortly before sleep time, Malenchenko will set up the Russian MBI-12 SONOKARD (Sonocard) payload and started his tenth experiment session, using a sports shirt from the SONOKARD kit with a special device in the pocket for testing a new method for acquiring physiological data without using direct contact on the skin. Measurements are recorded on a data card for return to Earth. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

At ~3:25am EDT, Leo Eyharts powered up the SM's amateur radio equipment (Kenwood VHF transceiver with manual frequency selection, headset, and power supply), to conduct, at 3:30am, a ham radio exchange with students at Robespierre School in Rueil-Malmaison, France. Questions to Leo were uplinked by ARISS (Amateur Radio on ISS) beforehand. *["When do you know when it is time to sleep?"; "What do you like to eat on earth, that you could not have in the ISS?"; "Is it frightening to go to space?"; "How long could the Space Station remain in space?"; "What do you do if you get sick?"; "Are there any meteors passing nearby the ISS?"; "How could you take a shower in zero-gravity?"; "Is the Earth pollution visible from the space?"; "What did you put in your suitcase before leaving to the space?"; "Do you plan to live one day on another planet?"]*

VolSci Program Update: For the Voluntary Science program on 2/24 (Sunday), Peggy Whitson has opted for another session with the InSPACE-2 experiment.

VOA Shutdown: Yesterday the US VOA (Volatile Organics Analyzer) shut down after successfully running through a test and shortly after the standard Sample Acquire command was sent by the ground. Specialists are analyzing a VOA data dump before any further troubleshooting will be performed.

CEO photo targets uplinked for today were **Brent Impact Crater** *(weather was predicted to be partly cloudy in this area, but hopefully it was clear enough for the crew to see this crater. Brent impact crater is 3.8 kilometers in diameter and is one of the older craters, dated at approximately 396 million years. As with many craters in Canada, this one is highlighted by the lakes that fill in part of the crater), and* **Charlevoix Impact Crater** *(as with Brent crater, the area around Charlevoix is also predicted to be partly cloudy. Roughly half of this impact crater is visible along the left bank (western side) of the St. Lawrence River. Charlevoix is 54 kilometers in diameter and 342 million years old)*.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 6:27am EST [= epoch]):
Mean altitude -- 337.7 km
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Perigee height -- 332.6 km
Period -- 91.29 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007653
Solar Beta Angle -- -58.9 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 100 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 53011

Significant Events Ahead *(all dates Eastern Standard, some changes possible.):*
02/28/08 -- ISS Reboost w/IWIS, SDMS
03/07/08 -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana) (~11:23pm EST); docking 04/03
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/12/08 -- ATV CAM (Collision Avoidance Maneuver) demo
03/13/08 -- STS-123/Endeavour/1J/A docking
03/18/08 -- ATV1 parking orbit (loiter)

03/25/08 -- STS-123/Endeavour/1J/A undocking
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 – STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
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10/01/08 -- **NASA 50 Years**
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10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
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11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
04/15/09 -- **Constellation’s Ares I-X Launch**
04/23/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/??/09 -- STS-128/Discovery/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
08/??/09 -- STS-129/Endeavour/ULF3 - ELC1, ELC2
10/??/09 -- STS-130/Discovery/19A - MPLM
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/20/08
Date:	Wednesday, February 20, 2008 1:15:36 PM
Attachments:	

ISS On-Orbit Status 02/20/08

All ISS systems continue to function nominally, except those noted previously or below.

STS-122/Atlantis returned to Earth this morning after 12d 18h 22min in space, touching down at KSC on the first landing opportunity at 9:07am EST, after 202 orbits & 5.3 million miles. During the perfectly executed ISS 1E mission, its seven-member crew conducted three EVAs, delivered and installed the European Columbus laboratory, brought up new Expedition 16 crewmember Léopold Eyharts and returned his predecessor Dan Tani who spent 121 days in space (116 on board the station). It was the 121st flight of a Space Shuttle, the 24th Shuttle mission to visit the station and the 29th for Atlantis. *Welcome back, Atlantis! Next up: STS-123/Endeavour/1J/A on March 11 with the Kibo laboratory module – Japan/JAXA's BIG day.*

Wake/sleep cycle for the crew remains at 1:00am-4:30pm EST.

FE-2 Eyharts began his day with a 15-min familiarization session of the ELITE-S2 payload, reviewing upcoming activation and checkout procedures. Later (~1:10pm EST), Leo conducted a teleconference with ground personnel, including Gianluca Neri, the experiment's PD (Payload Developer). *[The Italian (ASI) experiment ELITE-S2 (Elaboratore Immagini Televisive - Space 2) is a human motion analysis facility for technological characterization and potential application for multifactorial movement analysis, to study the connection between brain, visualization and motion in micro-G. By recording and analyzing the three-dimensional motion of astronauts, this study should help engineers apply ergonomics into future spacecraft designs and determine the effects of weightlessness on breathing mechanisms for long-duration missions.]*

The FE-2 also continued commissioning of the COL (Columbus Orbital Laboratory), finishing up readying the BLB (Biolab) facility. *[Leo's activities included BioGlovebox containment and sterilization testing, BioGlovebox health check as*

well as configuring the BGB LSM (Life Support Module) by setting the GN_2 (gaseous nitrogen) valve on the Biolab Rack UIP (Utility Interface Panel) to "N_2 Supply" and opening Life Support Gas B.]

Working in the "Quest" Airlock on more post-EVA cleanup tasks, CDR Whitson set up and started the periodic scrubbing process on the EMU (Extravehicular Mobility Unit) cooling water loops, by initiating ionic and particulate matter filtration (using a 3-micron filter) on suits #3006 & #3018, then starting (and later terminating) cooling loop iodination (biocide maintenance). Afterwards, the cooling loops were reconfigured and the EMU water processing kit disassembled and stowed. *[Purpose of the scrubbing, including iodination of the LCVGs (Liquid Cooling & Ventilation Garments) for biocidal maintenance, is the elimination of any biomass and particulate matter that may have accumulated in the loops.]*

FE-1 Malenchenko worked on the Russian BSPN Payload Server, upgrading the RSS1 laptop computer with new a software version from a file uplinked by TsUP-Moscow overnight.

In support of IP (International Partners) video requirements, Peggy Whitson used the Lab RWS (Robotic Workstation) for troubleshooting the faulty RS (Russian Segment) video setup for downlinking analog video signals via US Ku-band and digital "streaming video" packets via the MPEG-2 (Moving Pictures Expert Group 2) encoder, U.S. OpsLAN and Ku-band. *[To look for the fault in the video setup, Peggy was to go by a process of elimination, connecting/disconnecting cables, swapping laptop shells and hard drives, etc.]*

The FE-1 did more ATV (Automated Transfer Vehicle)-related work by running tests of the connection of the KL-154 "Klest" television equipment with the ATV television control console (BRTK-PU).

The CDR performed a routine inspection of the MELFI (Minus Eighty Degree Laboratory Freezer for the International Space Station). *[Purpose: to verify Dewar 3 configuration (tray & box module), remove any condensation found, and inspect the dewar's box module lids.]*

FE-2 Eyharts filled out the regular FFQ (Food Frequency Questionnaire), his first, on the MEC (Medical Equipment Computer). *[By means of these FFQs, NASA/ESA astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins.]*

Afterwards, Eyharts set up and conducted the periodic (monthly) O-OHA (On-Orbit Hearing Assessment) test, a 30-min NASA EHS (Environmental Health Systems) examination to assess the efficacy of acoustic countermeasures, using a special MEC laptop application. It was Leo's first onboard O-OHA session. *[The O-OHA audiography test involves minimum audibility measurements for each ear over a wide range of frequencies (0.25-10 kHz) and sound pressure levels, with the crewmembers using individual-specific Prophonics earphones, Bose ANC headsets and the SLM (sound level meter). To conduct the testing, the experimenter is supported by special EarQ software on the MEC, featuring an up/down-arrow-operated slider for each test frequency that the crewmember moves to the lowest sound pressure level at which the tone can still be heard. The baseline test is required not later than about Flight Day 14 for each new Expedition and is then generally performed once per month. Note: There have been temporary hearing deficits documented on some U.S. and Russian crewmembers, all of which recovered to pre-mission levels.]*

Whitson & Eyharts each completed a run with the MedOps WinSCAT (Spaceflight Cognitive Assessment Tool) experiment by logging in on the MEC and performing the psychological evaluation exercise on the laptop-based WinSCAT experiment. It was Peggy's fourth and Leo's first session. *[WinSCAT is a time-constrained questionnaire test of cognitive abilities, routinely performed by astronauts aboard the ISS every 30 days before or after the PHS (periodic health status) test or on special CDR's, crewmembers or flight surgeons request.]*

The CDR had 75 min reserved for unpacking and stowing 1E-delivered cargo, supported by an uplinked Unpack List.

Peggy also conducted the periodic (every two weeks) 10-min inspection of the RED (Resistive Exercise Device) canister cords and accessory straps as well as the canister bolts for re-tightening if required.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR) and VELO bike with bungee cord load trainer (FE-1).

Peggy then transferred the crew's exercise data file to the MEC laptop for downlinking, as well as the daily wristband HRM data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Continuing the current round of RS ventilation system maintenance, the FE-2 worked in the FGB module cleaning the ventilation screens of interior panels 201,

301 and 401.

FE-1 Yuri Malenchenko completed the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Working off his discretionary "time permitting" task list, the FE-1 also was to –

- Perform the daily 20-min IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur),
- Conduct the daily monitoring, picture-taking and downloading on the newly set up BIO-5 Rasteniya-2 ("Plants-2") experiment *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/ video recording. During the duration of the BIO-5 experiment, students of the Moscow City Palace for Youth Creativity of the Meshchansky inter-regional center #15 in Moscow) and the Prince of Oldenburg Lyceum in St. Petersburg will be cultivating plants in parallel on the ground and conducting comparative observation of plant growth and development under gravity and zero-gravity conditions. They are receiving the photo images taken by Yuri],*
- Do the regular checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder) *[this is a daily monitoring/temp checking, carried on the Russian voluntary task list for the duration of Expedition 16],*
- Perform the periodic downloading of accumulated log files from the Russian BSMM (Payload Matching Unit/computer) to the "Wiener" power laptop, then transfer its log files to US OCA for downlink, and
- Gather and prepare equipment required for a SOTR (Thermal Control System, US: TCS) test to measure KOB1 (Loop #1) hydraulic parameters *[during recent RS SOTR operation, the coolant pressure in KOB1 dropped, possibly because of entrapped air or a minor leak in the accumulator bellows. A test to measure the free air volume in KOB1 and to conduct a leak check on the system is scheduled for tomorrow (2/21).]*

A new task added to the US "job jar" task list is for Peggy to start prepack preparations for the next Shuttle visit, STS-123-1J/A next month.

No CEO photo targets uplinked for today.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
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Solar Beta Angle -- -56.4 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 44 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52997

Significant Events Ahead *(all dates Eastern Standard, some changes possible.):*
02/28/08 -- ISS Reboost w/IWIS, SDMS
03/07/08 -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana) (~11:23pm EST); docking 04/03
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/12/08 -- ATV CAM (Collision Avoidance Maneuver) demo
03/13/08 -- STS-123/Endeavour/1J/A docking
03/18/08 -- ATV1 parking orbit (loiter)
03/25/08 -- STS-123/Endeavour/1J/A undocking
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
05/25/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS

05/27/08 -- STS-124/Discovery/1J docking
06/05/08 -- STS-124/Discovery/1J undocking
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 – STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
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10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
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11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
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12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
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12/15/08 -- STS-119/Discovery/15A undocking
04/15/09 -- **Constellation's Ares I-X Launch**
04/23/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
05/??/09 -- STS-128/Discovery/17A - MPLM, last crew rotation
05/??/09 -- **Six-person crew on ISS (following Soyuz 18S-2 docking)**
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10/??/09 -- STS-130/Discovery/19A - MPLM
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/19/08
Date:	Tuesday, February 19, 2008 12:59:00 PM
Attachments:	

ISS On-Orbit Status 02/19/08

All ISS systems continue to function nominally, except those noted previously or below. *Crew rest day.*

Wake/sleep cycle for the crew was adjusted to 1:00am-4:30pm EST.

For today's Voluntary Science program, CDR Whitson continued her work with the InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) experiment in the MSG (Microgravity Science Glovebox), conducting runs #28, #29 and #30, investigating low frequency behavior of the lowest concentration magnetorheological (MR) fluid, exchanging video tapes after each run, then switching to the highest concentration (vial #4) and finally powering the MSG down. *[The activity included an EPO (Education Payload Operation) Demo for grades 9-12. InSPACE obtains basic data on MR fluids, i.e., a new class of "smart materials" that can be used to improve or develop new brake systems, seat suspensions robotics, clutches, airplane landing gear, and vibration damper systems. The colloidal (dispersed) particles are contained in CAs (Coil Assemblies) in the MSG that subject them to electric fields at certain strength and frequencies. The desired strong dipolar interaction between the small colloidal particles can be achieved in micro-G simply with an external magnetic field being turned on and off. On the ground, the flow properties (rheology) of many materials, especially those making up consumer products like detergents, fabric softeners, toothpaste and paints, are similarly controlled, though not by magnetic fields but by adding a polymer. It now appears, for example, that new formulations of fabric softeners may perform better in space than on earth.]*

FE-2 Leo Eyharts broke out and set up the PFE-OUM (Periodic Fitness Evaluation-Oxygen Uptake Measurement) equipment on the HRF-2 (Human Research Facility 2) rack, including the HRF PFM/PAM (Pulmonary Function Module/Photoacoustic Analyzer Module), Mixing Bag System and GDS (Gas Delivery System). Data collection on Leo as subject, with Peggy as operator, is scheduled tomorrow. *[The PFE-OUM experiment, using the CEVIS ergometer for workout, demonstrates the*

capability of crewmembers to perform periodic fitness evaluations with continuous oxygen consumption measurements within 14 days after arrival on ISS, and once monthly during routine PFEs. Once the capability of the pulmonary function system (PFS) to perform PFEs is verified, crewmembers will be able to integrate their monthly PFE with oxygen consumption measurements to fulfill the requirement for cardiovascular fitness evaluations during long-duration space flight.]

FE-1 Yuri Malenchenko completed the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Working off his discretionary "time permitting" task list, the FE-1 performed the periodic downloading of accumulated log files from the Russian BSMM (Payload Matching Unit/computer) to the "Wiener" power laptop, then transferred two log files to US OCA for downlink.

Also on Yuri's task list for today was the regular check of the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature checkup on its ART (automatic temperature recorder). *[This is a daily monitoring/temp checking, carried on the Russian voluntary task list for the duration of Expedition 16.]*

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1, FE-2). The CEVIS is set up for tomorrow's PFE-OUM session by Leo.

Peggy then transferred the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~3:30am EST, the crew participated in a TV downlink of greetings for replay to the participants of the 12th World Russian People's Council taking place in the State Kremlin Palace in Moscow from 2/20 to 2/22. *[An assembly of children and young people, the Congress is devoted to the theme "Future Generations – Russia's National Treasure". For the first time in the history of the World Russian People's Council since 1993, the majority of the forum participants will be young people from all corners of Russia. President V.V. Putin and Alexy II, Patriarch of Moscow and All of Russia, are expected to address the Council with their welcome greetings.*

Over 5000 people will participate in the Congress, to be greeted by the ISS crew: "…Our society needs you to be bold, dynamic, thinking, searching! You will be implementing ideas of Tsiolkovsky, Korolev, and other space pioneers. We also congratulate students of the Bauman Moscow State University who won the Innovation Project 2007 competition in the Youths and Space category. Today, our space home is orbiting the Earth, and tomorrow these words from a song will become a reality: "Fly around the Earth and go to Mars!" Mars is awaiting you!"]

MT Translation: Later today (4:20pm-6:20pm) the Mobile Transporter cart will be translated on its rails by ground commanding from WS7 (Worksite 7) to WS4 to provide added MMOD (Micrometeoroid/Orbital Debris) protection of the TUS (Trailing Umbilical System), as before Flight 1E. During the move, Russian thrusters will be inhibited (3:49pm-6:25pm) due to loads constraints.

WDS Update: An updated Water Delivery System "cue card" was uplinked for the crew's reference. The new card (16-0018T) lists 36 CWCs (Contingency Water Containers; ~1295.1 L total) for the four types of water identified on board: technical water (695.3 L, for Elektron, flushing, hygiene), potable water (559.5 L), condensate water (40.2 l), waste/EMU dump and other (0 L). Of the 36 containers, nine CWCs with technical water (251.1 L) cannot be used until cleared for *Wautersia* bacteria, and 10 CWCs with potable water (427 L), transferred from Atlantis, are not cleared for use pending analysis of samples returning on 1E.

Weekend Voluntary Science: Two optional activities for the voluntary "Saturday Science" program for next weekend (2/23-24) were suggested to Peggy for her choice. Selection is required by tonight. *[The two choices are: (1) InSPACE-2 – two experiment runs on 2/23 and three runs on 2/24; (2) EPO – Careers Demo (Identify all the different steps crewmembers have taken to get to where they are today. Identify all the different NASA careers that work together to prepare an astronaut for spaceflight. Objective: to motivate students to strive for a career in science, technology, engineering, and mathematics and to someday work for NASA.]*

No CEO photo targets uplinked for today.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 8:39am EST [= epoch]):
Mean altitude -- 337.8 km
Apogee height -- 343.0 km
Perigee height -- 332.6 km
Period -- 91.29 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0007759
Solar Beta Angle -- -53.2 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 380 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52981

Significant Events Ahead *(all dates Eastern Standard, some changes possible.):*
02/20/08 -- STS-122/Atlantis/1E landing at KSC (nominal) ~9:06am ET
02/28/08 -- ISS Reboost w/IWIS, SDMS
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04/10/08 -- Soyuz TMA-12/16S docking (DC1)
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04/24/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
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05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
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08/28/08 – STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**

10/11/08 -- Progress M-65/30P undocking (from SM aft port)
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04/23/09 -- STS-127/Endeavour/2J/A launch - JEM EF, ELM-ES, ICC-VLD
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10/??/09 -- STS-130/Discovery/19A - MPLM
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

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http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/18/08
Date:	Monday, February 18, 2008 3:08:22 PM
Attachments:	image001.gif

ISS On-Orbit Status 02/18/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 18 of Increment 16, with a new FE-2, Léopold (Leo) Eyharts who has replaced Dan Tani. US Holiday (President's Day).*

STS-122/Atlantis and ISS are flying in separate orbits again *(Flight Day 12 for STS-122/1E)*

After final preparations on both sides of the hatches (closed yesterday on ISS side at 1:03pm EST), Atlantis this morning undocked smoothly at 4:27am from PMA-2 (Pressurized Mating Adapter 2), after a total docked time of 11d 13h 42m. *[For undocking, the station was turned from -XVV through ~180 deg to +XVV ZLV (+x-axis in velocity vector, z-axis in local vertical) at ~3:30am, put briefly on free drift for the undocking, and then maneuvered to 1E Stage attitude of +XVV TEA attitude at 5:06am.]* ***See picture from Atlantis flight deck, below.***

KSC landing is nominally expected on 2/20 (Wednesday) at ~9:06m EST. *[If the landing occurs as planned, STS-122 mission duration will be 12d 18h 21m. Dan Tani's total time in space will be 121 days, with 116 days on board ISS.]*

Aboard the station, the crew is enjoying a light-duty day. Wakeup for CDR Peggy Whitson, FE-1 Yuri Malenchenko and FE-2 Leo Eyharts was at ~12:45am. Sleep time tonight: 3:15pm EST.

With the U.S. CDRA (Carbon Dioxide Removal Assembly) deactivated by the ground overnight (~9:00pm-2:00am) and its cooling no longer required, Whitson demated and took down the ITCS LTL (Internal Thermal Control System/Low Temperature Loop) jumper at the CDRA-supporting LAB1D6 rack.

Both Eyharts and Whitson used the DCS760 digital cameras and PD-100 camcorder to document the undocking, backing away and separation of the Atlantis. Peggy later conducted the playback for transmitting the footage to the ground.

FE-1 Malenchenko made sure that the Lab science window was shuttered for protection against jet plumes during the undocking.

Before and during the undocking, the FE-1 stood by at a laptop with a stopwatch to monitor the proper performance of automatic undocking software for the PMA-2 departure under Russian thruster control. *[The procedure provides for the crewmember to take over the automatic operational attitude control sequence manually if the software does not resume control after the period of free drift a few minutes after physical separation.]*

After the undocking, PCS (Portable Computer System) laptops were not shut down as usual because of a planned uploading (on 2/22-23) of a patch to each PCS for a new MSS (Mobile Service System) software version (R5).

Assisted by Yuri, Peggy Whitson later depressurized the PMA-2 to prevent humidity condensation and pressure fluctuations. Leak checking by Peggy followed for the standard one hour. Afterwards, the necessary equipment was torn down.

The FE-1 did the reconfiguration of the Russian telephone/telegraph subsystem (STTS) to its post-undocking settings, from its primary string back to nominal mode on the backup string. This also severed the VHS (UHF) channel to the receding Shuttle Orbiter and restored the RSA-2 S/G (Space-to-Ground) comm configuration on Panel 3. *[The "Voskhod-M" STTS enables telephone communications between the SM, FGB, DC1 Docking Compartment and U.S. segment (USOS), and also with users on the ground over VHF channels selected by an operator at an SM comm panel, via STTS antennas on the SM's outside. There are six comm panels in the SM with pushbuttons for accessing any of three audio channels, plus an intercom channel. Other modes of the STTS include telegraphy (teletype), EVA voice, emergency alarms, Packet/Email, and TORU docking support.]*

In the US Airlock (A/L), the CDR terminated the bake-out regeneration of the last batch of METOX (Metal Oxide) canisters. *[As per ground request, she also inspected the oven's air inlet screen to assist in an airflow analysis.]*

Later, Peggy started the downloading of IWIS (Internal Wireless Instrumentation System) structural dynamics data recorded during the reboost and the undock activities. When completed, the CDR dismantled and stowed the IWIS hardware.

Structural dynamics data from the external SDMS (Structural Dynamic Measurement System) on the S0 truss were dumped by ground command at ~2:30pm.

Yuri Malenchenko terminated the current extended performance testing of the Russian KRIOGEM-03 refrigerator. *[Steps included removing the AX-03 icepack for return to its container and deactivating the freezer, leaving its door ajar temporarily for airing out, before wiping the camera with a dry napkin and closing the refrigerator's door.]*

The FE-1 had more time reserved for transferring cargo & payload equipment from Progress M-63/28P to the ISS, going by an uplinked list of locations and objectives. *[For example: Gear for the Korean experiment to be conducted by the next visiting cosmonaut*

(VC-14) was stowed in the DC1 Docking Compartment since the experiment will be performed there.]

At ~12:40pm, Dr. Whitson participated in a 20min. crew teleconference with the Principal Investigator (PI) of the InSPACE (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) to discuss Peggy's Voluntary Science activity tomorrow and results found to date. *[InSPACE, conducted last in June 2006 by Jeff Williams on Increment 13 and now again on Increment 16, obtains basic data on magnetorheological (MR) fluids, i.e., a new class of "smart materials" that can be used to improve or develop new brake systems, seat suspensions robotics, clutches, airplane landing gear, and vibration damper systems. The dispersed particles are contained in CAs (Coil Assemblies) in the MSG that subject them to electric fields of certain strength and frequencies. New visual data from InSPACE-2 of MR fluid structures in a pulsed magnetic field show columns of particles exhibiting an unexpected oscillation when viewed from the side (perpendicular to the applied magnetic field), reminiscent of the instabilities of a fluid jet. This behavior has never been observed in earthbound experiments with MR fluids. Additional experiments in the MSG helped to determine how this phenomenon varies when the operator changed the strength of the field, the concentration of the sample, and the pulse frequency.]*

Working off her voluntary "job jar" task list, Peggy also was to download/initialize her SLEEP experiment (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) Actiwatch which will stop taking data on 2/20 if not initialized. *[To monitor the crewmember's sleep/wake patterns and light exposure, Peggy wears a special Actiwatch device which measures the light levels encountered by her as well as her patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the "job jar" task list.]*

Also on the CDR's task list was the set-up of an additional SSC (Station Support Computer) in COL as per Peggy's request. *[For lack of sufficient wireless/RF bandwidth, ground recommendation is for her to use an additional drag-thru LAN cable across the hatch from Node-2.]*

To allow use of a camcorder in Node-2, Peggy removed the J01 cap at the Node's VDC video camcorder port (N2 S3) and stowed it away.

FE-2 Eyharts continued COL (Columbus Orbital Laboratory) commissioning activities on the BLB (Biolab), including opening its gas supply line, checking out OHD (Overheat Detection) functionality, testing its laptop and conducting a sterilization functionality test on the BLBGlovebox.

Leo also worked on the MEC (Medical Equipment Computer) to personalize its software load for storing his own physical exercise data.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer

(CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Malenchenko then transferred the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~12:12pam, Leo had a PFC (Private Family Conference) via S-band/audio and Ku-band/ MS-NetMeeting application (which displays the uplinked ground video on the SSC-9 laptop).

No CEO photo targets uplinked for today.

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ISS Orbit (as of this morning, 8:28am EST [= epoch]):
Mean altitude -- 338.2 km
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Perigee height -- 332.8 km
Period -- 91.30 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0008114
Solar Beta Angle -- -49.6 deg (magnitude increasing)
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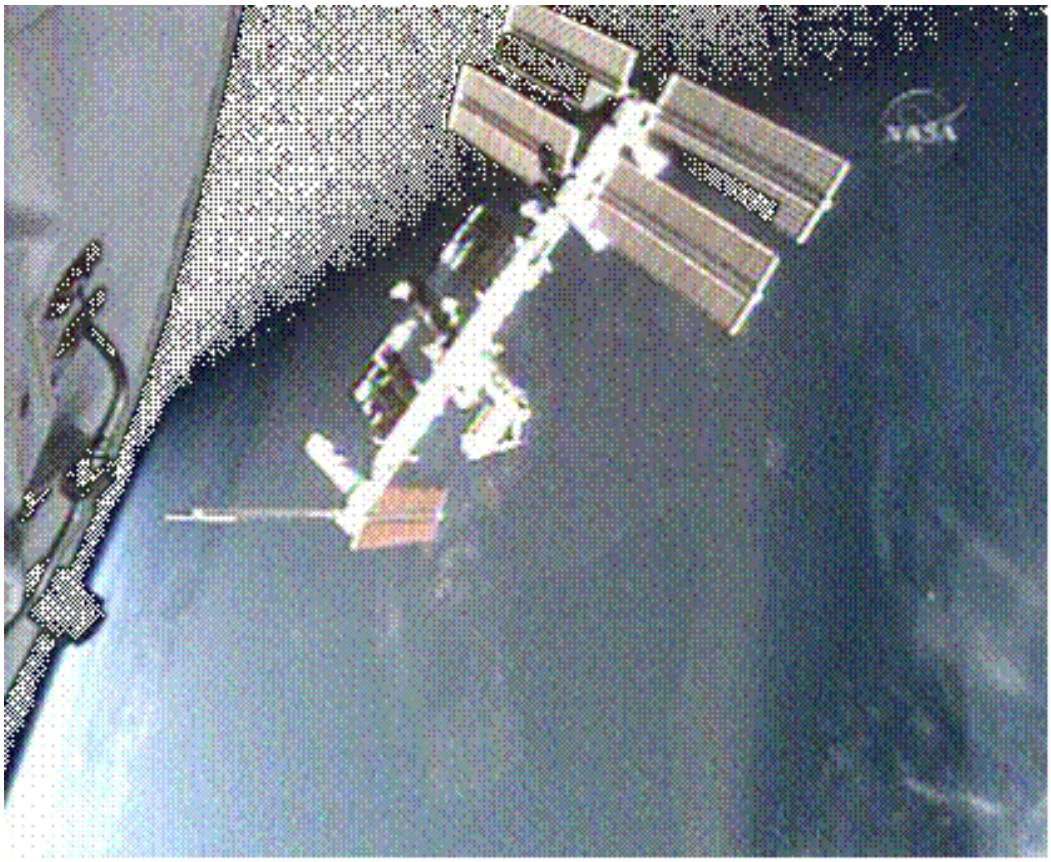
ISS seen this morning (2/18) from departing STS-122/Atlantis


NASA

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/17/08
Date:	Sunday, February 17, 2008 1:28:58 PM
Attachments:	

ISS On-Orbit Status 02/17/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday --- Mission 1E Flight Day 11 (FD11). Dan Tani's 118th day in space (116 aboard ISS). Ahead: Week 18 of Increment 16.*

Wake/sleep cycle shifted further back to prepare for 2/18 undocking: 1:45am – 4:15pm EST (incl. Eyharts), Shuttle crew: 1:45am – 4:45pm (incl. Tani).

CDR Peggy Whitson performed her final INTEGRATED IMMUNE blood collection, assisted by MS1 Leland Melvin, right before hatch closure. FE-2 Dan Tani will continue his saliva collections, both liquid and dry, and blood collections aboard the Atlantis all the way home FE-2-16 Leo Eyharts transferred his and Peggy's saliva return pouches and blood sleeves as well as Dan's saliva collection kit to the Shuttle for return. *[Background: IMMUNE assessment, integrated with the Russian IMMUNO, is a 24-hr. test of human immune system changes, with the objective to investigate immune neuro-endocrine reactions in the space environment by studying samples of saliva, blood and urine using collection kits and the biomedical (MBI) protection kit, to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected at intervals during the collection day using a specialized book that contains filter paper. The liquid saliva collections require that the crewmember soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations. The on-orbit blood samples are collected right before undocking and returned on the Shuttle so that analysis can occur with 48 hours of the sampling. This allows assays that quantify the function of different types white blood cells and other active components of the immune system. For cold storage, samples are secured in the MELFI (Minus-Eighty Laboratory Freezer for ISS). Also included are entries in a fluid/medications intact log, and a stress-test questionnaire to be filled out by the subject at begin and end. Urine is collected during a 24-hour period, conventionally divided into two twelve-hour phases: morning-evening and evening-morning.]*

More crewtime was applied to COL (Columbus Orbital Laboratory) rack configuration, activation & operation, led by CDR Peggy Whitson and MS3 Hans Schlegel.

Whitson terminated the fine leak check of the COL/Node-2 vestibule (which showed successful hermeticity), then ingressed the new module (~3:55 am) for performing the required COL IATCS (Internal Active Thermal Control System) coolant fluid sampling. *[After installation and purging (degassing) the sampling adaptor and FSS (Fluid System Servicer) hose of entrapped air, further steps included configuring the adapter, adjusting the metering valve, collecting the return sample, and tearing down and removing the degassing & sampling equipment.]*

Hans Schlegel meanwhile continued activation of the EDR (European Drawer Rack) and BLB (BIOLAB). *[On EDR, Schlegel activated the laptop, connected & test-activated (later deactivated) the PCDF EU (Protein Crystallization Diagnostic Facility Electronic Unit). On BLB, he set up the laptop, installed stowage items (SI, power & video cables, 4 BGB front filters, plus removal of Kapton tape from rear filters) & commissioning items (CI, EU mounting plate, spotlight) for the BLBGlovebox, then verified functionality of the power switch on front.]*

Later, Schlegel took documentary 3D photography of the COL interior using a NIKON camera equipped with two lenses for stereoscopic imagery.

Afterwards, Peggy worked on installing the K-BAR (Knee-Brace Assembly Replacement) capture mechanisms on COL racks A1 and F2 (which gave Tani and Eyharts some trouble) for relocating of the MSG (Microgravity Science Glovebox) and EXPRESS Rack 3 (ER3) racks.

COL activation & commissioning also included the EPM (European Physiology Module) and the FSL (Fluid Science Laboratory), the latter's to be completed by Leo Eyharts.

FE-1 Malenchenko took the periodic sensor readings of the Russian "Pille-MKS" (MKS = ISS) radiation dosimetry experiment which has ten sensors placed at various locations in the Russian segment (port cabin window, starboard cabin window, ASU toilet facility, control panel, etc.). Nine of the ten dosimeters are read manually.

Concluding post-EVA clean-up ops, FE-2 Dan Tani terminated the overnight regeneration of METOX (Metal Oxide) canisters in the Airlock (A/L) oven and initiated the process on the next batch.

CDR Whitson gathered and stowed the EVA tools used during the 1E spacewalks, finishing up what Rex Walheim couldn't quite complete yesterday.

Winding up the three-day checkout of the KUBIK-3 thermally controlled incubator in the Soyuz 15S Orbital Compartment, Yuri copied the accumulated time/temperature data for subsequent downlinking via the BSR-TM payload telemetry channel, then deactivated the thermostat system and closed out ops.

Dan Tani had ~4 hrs for changing out and replacing the failed SSPCM (Solid State Power

Control Module) in the HRF1 (Human Research Facility Rack 1) in the US Lab, to be checked out later by CDR Whitson. *[However, afterwards the rack is exhibiting some anomalous conditions which constrain its re-activation.]*

Malenchenko performed maintenance and functionality checks on the Russian VELO cycle ergometer (VB-3), focusing on its pedals, crank arm and internal springs, involving disassembly and reassembly of the exercise device.

Peggy and Dan reviewed DCB (Double Cold Bag) procedure familiarization material, then packed return samples and transferred the DCB to the Shuttle.

CDR Whitson, CDR Frick and PLT Poindexter concluded the O_2 (oxygen) transfer from Atlantis to the ISS HPGTs (High-Pressure Gas Tanks) on the exterior of the A/L after ~15 hours of operation, then tore down the transfer and pump-over equipment. Total amount O_2 transferred: 85-90 lbs. *[This transfer used the remaining operational cycles allowed under Flight Rule for the diaphragm pump of the ORCA (Oxygen Recharge Compressor Assembly) which had been modified by waiver from 280,000 to 373,000 cycles. A replacement ORCA will be delivered to KSC in December this year.]*

The FE-1 had 2h 15m reserved for transferring cargo & payload equipment from Progress M-63/28P to the ISS, going by an uplinked list of locations and objectives. *[For example: The equipment for the Korean experiment to be conducted by the next visiting cosmonaut (VC-14) was to be stowed in the DC1 Docking Compartment since the experiment will be performed there.]*

Yuri completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables plus the weekly collection of the toilet flush counter (SPK-U) and water supply (SVO) readings for calldown to TsUP/Moscow.

Malenchenko also gathered weekly data on total operating time & “On” durations of the Russian POTOK-150MK (150 micron) air filter unit of the SM’s SOGS air revitalization subsystem for reporting to TsUP.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2/Leo), TVIS treadmill (CDR, FE-2/Leo), RED resistive exercise device (CDR) and VELO bike with bungee cord load trainer (FE-1).

Malenchenko later transferred the crew’s exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~7:10am, Yuri had a PFC (Private Family Conference) via S-band/audio and Ku-band/ MS-NetMeeting application (which displays the uplinked ground video on the SSC-9

laptop).

The traditional **Crew Farewell** ceremony took place at 12:20pm EST, followed by air duct removal and hatch closure at ~1:03pm, handled on the ISS side by Peggy Whitson and Yuri Malenchenko. *[Afterwards, Frick and Poindexter switched attitude control authority of the mated stack from ISS CMG TA (Control Moment Gyroscope Thruster Assist) mode to Orbiter control.]*

Atlantis will undock from ISS tomorrow morning at 4:27am after a total docked time of 11d 13h 42m. After a one-orbit flyaround for photo imaging at 400-600 ft, final separation burn of the Shuttle will be performed at 6:10pm. Landing is set for Wednesday, 2/20, nominally at KSC at 9:06am EST. Total mission for STS-122/1E will then have been 12d 18h 21m. Dan Tani's total time in space will be 121 days, with 116 days on board ISS.

Transfers Update: Total water transferred from Atlantis: ~1386 lbs. Total nitrogen (N_2) transferred: ~37 lbs. Total oxygen (O_2) transferred: ~90 lbs.

Progress 27P Deorbit: Two days ago, on 2/15, Progress M-62/27P performed its deorbit burn and reentered the atmosphere for burn-up and splash down in the Pacific. *[Progress 27P undocked from the ISS DC1 on 2/4 at 5:32am EST but remained in orbit in free flight until 2/15, continuing to phase out in front of the ISS (about 40 km per orbit) in order to support Russian Earth observation experiments.]*

Good-Bye Sally Davis: This was Flight Director Sally Davis' final shift ("Cassini Flight") after more than 400 shifts on the ISS flight control team (FCT). Thank you, Sally – and stick around!

After Shuttle departure, the ISS crew will –

- Deactivate the IWIS (Internal Wireless Instrumentation System) equipment,
- Reconfigure the Airlock CCAA (Common Cabin Air Assembly) flexible air duct to its nominal stage setup,
- Disconnect the UOP DCP (utility outlet panel/display & control panel) bypass power cable for the VTR at the Lab RWS (Robotics Work Station),
- Restore the onboard communications network to its nominal configuration, and
- Depressurize the PMA-2 to prevent humidity condensation and pressure fluctuations, followed by leak checking for the standard one hour. Afterwards, the necessary equipment will be torn down.

No CEO photo targets uplinked for today.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

Significant Events Ahead *(all dates Eastern Standard, some changes possible.):*

- 02/18 (FD 12) -- Undock from ISS (~4:27am ET); perform final OBSS berthing;
- 02/19 (FD 13) -- Stow cabin; checkout Shuttle flight control systems;
- 02/20 (FD 14) -- . Prepare for and perform deorbit burn; land at KSC (nominal) ~9:06am ET

02/28/08 -- ISS Reboost w/IWIS, SDMS
03/07/08 -- ATV-1 “Jules Verne” launch/Ariane V (Kourou, French Guyana) (~11:23pm EST); docking 04/03
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/12/08 -- ATV CAM (Collision Avoidance Maneuver) demo
03/13/08 -- STS-123/Endeavour/1J/A docking
03/18/08 -- ATV1 parking orbit (loiter)
03/25/08 -- STS-123/Endeavour/1J/A undocking
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 – STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch

11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/16/08
Date:	Saturday, February 16, 2008 4:16:39 PM
Attachments:	

ISS On-Orbit Status 02/16/08

All ISS systems continue to function nominally, except those noted previously or below. *Mission 1E Flight Day 10 (FD10). Saturday – half-day off for the combined ISS & Shuttle crew except for housekeeping and voluntary work.*

Wake/sleep cycle shifted back again to prepare for 2/18 undocking: 3:15am – 5:15pm EST, Shuttle crew: 3:15am – 5:45pm.

More crewtime was applied to COL (Columbus Orbital Laboratory) rack configuration, activation & operation, led by CDR Peggy Whitson and FE-2-16 Leo Eyharts. *[In particular, Whitson focused on readying the EDR (European Drawer Rack), gathering equipment, outfitting the rack, installing PCDF EU (Protein Crystalization Diagnostic Facility Electronic Unit) coolant water and data connections, setting up the laptop, verifying its software load & activating it, checking out the EDR RFI (Rack Fire Indicator), and checking out the functionalities of the rack's various subsystems.]*

CDR Whitson also performed Part 1 of troubleshooting & cable connectivity checkout of the PS28 (Powerstrip 28) junction box.

Afterwards Peggy relocated MSG (Microgravity Science Glovebox) payload hardware to the newly installed COL ZSR (Zero-G Stowage Rack).

MS3 Schlegel meanwhile worked on BIOLAB (BLB), installing stowage items required for BLB and BLB BioGlovebox commissioning. *[BLB activation steps included installation of analysis instruments, viz., D&C (Distribution & Cleaning) cassettes for the microscope and the spectrophotometer, lamp assembly for the spectrophotometer, VTR (Video Tape Recorder) damping system, the VTR itself and its test tape, the BGB laptop (power & video cables), four BGB front filters plus removal of protective Kapton tape from BGB rear filters, EC (Experiment Container) mounting plate, and the BGB spotlight. Activities concluded with a BGB BioGlovebox containment test and sterilization functionality test.]*

CDR Whitson, CDR Frick and PLT Poindexter reconfigured the O_2 (oxygen) transfer system and initiated O_2 pump-over from the Orbiter to the HPGTs (High-Pressure Gas Tanks) on the exterior of the U.S. Airlock (A/L). Total amount O_2 available for transfer: ~90

lbs. *[This transfer used the remaining operational cycles allowed under Flight Rule for the diaphragm pump of the ORCA (Oxygen Recharge Compressor Assembly) which had been modified by waiver from 280,000 to 373,000 cycles. A replacement ORCA will be delivered to KSC in December this year.]*

Using the RSK1 laptop, FE-2 Malenchenko continued his test program with the new KPT-2 BAR-RM payload equipment begun on 2/13, today taking measurements with the AU-1 ultrasound analyzer at various locations in the RO (large diameter) section of the Service Module (SM) and later downlinking the data via BSR-TM channel. The data are being used for experimenting with ISS leak detection based on environmental data anomalies (temperature, humidity, and ultrasound emissions) at possible leak locations. *[BAR-RM is designed to develop a procedure for detection of air leakage from ISS modules based on environmental data anomalies (temperature, humidity, ultrasound emissions). The payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/thermometer (TTM-2), an ultrasound analyzer (AU-01), and a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station. Measurements are taken in specific zones (13 in SM PkhO and 4 in DC1), both with lights & fans turned on and off.]*

FE-2 Dan Tani worked in the A/L cleaning up after yesterday's EVA-3 by Walheim and Love, deconfiguring one of the two DCS-760 cameras (without flash) and stowing it, terminating regeneration of the first set of METOX (Metal Oxide) canisters initiated by Peggy yesterday and then starting the process on the second set (#15 & #16).

CDR Whitson meanwhile conducted the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week (currently #16-0018R).]*

After setting up the KUBIK-3 thermally controlled incubator in the Soyuz 15S Orbital Compartment yesterday and switching it later from +37 degC +6 degC for running overnight, Malenchenko today checked its performance at that value and later reset it to +38 degC for continued monitoring (which included removal of the resulting moisture later today).

Dan Tani removed the VOA (Volatile Organics Analyzer) from the Lab CHeCS rack and had ~2.5 hrs set aside for changing out and replacing its OMIs (On-orbit Maintenance Items) with new spares.

FE-1 Malenchenko set up the pumping equipment and initiated (later closed out) the periodic transfer of urine from four EDV-U containers in the SM to the Rodnik BV2 tank of Progress M-63/28P (emptied of potable water on 2/14).

Frick and Poindexter continued filling containers with fuel-cell generated water in the Orbiter for transfer to the ISS. After today, total water transfers amount to 11 CWCs and 8

PWRs (Payload Water Reservoirs).

The two FE-2s, Tani & Eyharts, had another hour to continue their handover activities which prepare Leo for taking over from Dan after Shuttle undock.

Servicing and maintenance tasks completed by Yuri Malenchenko today included –

- The periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS (Russian segment) hatch openings (8) in the SM, FGB and DC1 (Docking Compartment),
- Completing the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, plus from his discretionary "time permitting" task list --
- The daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur),
- The daily monitoring, picture-taking and downloading on the newly set up BIO-5 Rasteniya-2 ("Plants-2") experiment. *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. During the duration of the BIO-5 experiment, students of the Moscow City Palace for Youth Creativity of the Meshchansky inter-regional center #15 in Moscow) and the Prince of Oldenburg Lyceum in St. Petersburg will be cultivating plants in parallel on the ground and conducting comparative observation of plant growth and development under gravity and zero-gravity conditions. They are receiving the photo images taken by Yuri.],* and
- The regular checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder). *[This is a daily monitoring/temp checking, carried on the Russian voluntary task list for the duration of Expedition 16.]*

A new item on the US voluntary "job jar" task list for Peggy today was to conduct a count and audit of the contents of CD (Compact Disk) Vol. 3 container.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Malenchenko later transferred the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

This morning at ~8:40am EST, the combined flight crew of 10 persons participated in a 40-min PAO TV interview/exchange from COL with a large number of media clients at NASA centers (JSC, KSC), ESA's EAC (European Astronaut Centre) in Cologne, Germany, and CNES HQ in Paris, France, for ESA. The event went exceedingly well, with every crewmember except Yuri called on to participate.

Reboost Update: This morning's reboost of the mated stack by the Orbiter was executed nominally, resulting in a burn duration 36 min 0 sec, delta-V of ~1.3 m/s and mean altitude increase ~2.3 km/1,.2 n.mi. Purpose of the reboost (the first executed by Atlantis since 2002) was to establish the correct phasing conditions for Soyuz 15S landing, Soyuz 16S launch and the next Shuttle mission, STS-123/1JA.

EVA-3 Update: Evaluation of yesterday's spacewalk showed that it ran 30 min longer than planned and achieved all objectives plus some of the get-aheads, except for 1J/A and SARJ task items.

Voluntary Science Program: For the voluntary science program on 2/19 (Tuesday), Peggy Whitson has opted for another session with the InSPACE-2 experiment.

Weekly Science Update (Expedition Sixteen -- Week 17)

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Radiation measurements continue to be performed in the PIRS module..

ANITA: Completed.

BCAT-3 (Binary Colloidal Alloy Test 3): "BCAT-3 has now been stowed with the intention to take it out again in about six months for the long duration sample equilibrium photos. Before BCAT-3 was stored, we were able to get some new photos of Sample 5 using the Dan Tani setup and lighting (which works really well!). With this setup, we were able to see some structure in Sample 5, which was a pleasant surprise and very exciting for the BCAT-3 Principal Investigators (PIs). Additionally, the photos that Peggy took of Dan performing the BCAT-3 experiment are "way cool" and will be really nice to have when we are sharing the BCAT-3 results with the world.
It has been a joy to work with everyone on BCAT-3 and we're looking forward to similar opportunities with BCAT-4 (which goes up on 1JA) and with BCAT-5, which is in the works. These future experiments involve many science investigators from both NASA and CSA, which speaks volumes about how well BCAT-3 was performed by the astronauts and the ground-based support teams."

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): "Dan, thanks for completing the repeat CCISS session. The session went very well, and we are very impressed with your completion of two Holter checkouts during your mission!"

CFE (Capillary Flow Experiment): Reserve.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): In progress.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): In progress.

EuTEF (European Technology Exposure Facility): Planned. EuTEF has been successfully installed on COL External Platform during EVA-3 on 2/15 (FD9). Currently receiving telemetry on ground.

GEOFLOW: Planned.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Blood and urine samples of first session are stored in MELFI.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress..

Integrated Immune: "Peggy, you are half way through with your mid increment Integrated Immune collections. Dan, you are half way through with your last Integrated Immune session. Leo, you are half way through with your early increment Integrated Immune session."

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Complete.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 "Pirs".

MULTIGEN-1: MULTIGEN-1 samples will be downloaded on STS-122 (1E).

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION/REPOSITORY: In progress..

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): "Peggy, for Sleep, your Actiwatch will stop taking data on February 20, so the team is planning to add an activity to your task list soon. As always, all your extra logging is greatly appreciated! Also, thanks for your help with CCISS this past week. Dan, we hope you enjoyed Sleeping during your mission! You will be taking off your Actiwatch on the Shuttle so we can get it on the ground and download it. The PI looks forward to all your final data!"

SOLAR (Solar Monitoring Observatory): Planned. SOLAR has been successfully installed on COL External Platform during EVA-3 on 2/15 (FD9). Currently receiving telemetry on ground.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): In progress.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: In progress.

WAICO #1 (Waving and Coiling of Arabidopsis Roots at Different g-levels): WAICO#1 hardware launched on 1E. WAICO#1 items (ATCS with chemicals, Cultivation Box Bowls with Agar) transferred to MELFI on 2/10 (FD4). Two activities for transfer of 2 x 4 WAICO#1 seed containers to MELFI were performed on 2/11to start seed vernalization.

CEO (Crew Earth Observation): "With the extension of STS122, and since most of us in CEO will be working late Monday night and early Tuesday morning supporting Shuttle image analysis, we will not resume CEO ops on Tuesday, 2/19 as earlier planned. We will resume CEO operations on Wednesday, Feb. 20."

No CEO photo targets uplinked for today.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

Significant Events Ahead *(all dates Eastern Standard, some changes possible.):*

- 02/17 (FD 11) -- Cargo transfers; rendezvous tools checkout; O_2 transfer teardown; close hatches in preparation for undocking;
- 02/18 (FD 12) -- Undock from ISS (~4:26am ET); perform final OBSS berthing;
- 02/19 (FD 13) -- Stow cabin; checkout Shuttle flight control systems;
- 02/20 (FD 14) -- . Prepare for and perform deorbit burn; land at KSC (nominal) ~9:06am ET

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05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 – STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)

11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/15/08
Date:	Friday, February 15, 2008 4:08:03 PM
Attachments:	

ISS On-Orbit Status 02/15/08

All ISS systems continue to function nominally, except those noted previously or below. *Mission 1E Flight Day 9 (FD9)*.

ISS crew goes to sleep one hour earlier than yesterday: 3:45am – 6:15pm, Shuttle crew half an hour later. 3:45am – 6:45pm.

Mission 1E's EVA-3 was completed successfully by Rex Walheim & Stan Love in 7h 25m, accomplishing all its objectives and get-aheads.
[During the spacewalk, Walheim (EV1) & Love (EV3) transferred the European SOLAR (Solar Monitoring Observatory) and the EuTEF (European Technology Exposure Facility) to the COL EPF (Columbus Orbital Laboratory External Payload Facility), retrieved the failed CMG (Control Moment Gyro) for stowage in the Shuttle PLB for return, installed COL worksite interface fixtures and handrails, inspected a suspected sharp-edged MMOD impact site on an Airlock (A/L) handrail (#508), and inspected, photographed and took samples from the failed starboard SARJ (Solar Alpha Rotary Joint) race ring and covers not yet inspected before. Official start time of the spacewalk was 8:07am EST, about 28 min ahead of timeline, and it ended at 3:32pm. Total EVA duration (PET = Phase Elapsed Time) was 7h 25min. It was the 104th spacewalk for ISS assembly & maintenance and the 76th from the station (28 from Shuttle, 54 from Quest, 22 from Pirs) totaling 465h 21min, and the 8th for Expedition 16 (totaling 57h 29min). After today's EVA, a total of 129 spacewalkers (97 NASA astronauts, 21 Russians, and 11 astronauts representing Japan-1, Canada-4, France-1, Germany-2 and Sweden-3) have logged a total of 653h 43min outside the station on building, outfitting and servicing. It was also the 126th spacewalk involving U.S. astronauts.]

CDR Peggy Whitson and FE-2-16 Leo Eyharts finished their IMMUNO (Integrated Immune Assessment) experiment, begun on 2/9, with dry saliva collections, first thing after wake-up and then four more times during the day. All samples were stored at ambient temperature. *[Background: IMMUNO (Integrated Immune Assessment)is a 24-hr. test of human immune system changes, with the objective to investigate immune neuro-endocrine reactions in the space environment by studying samples of saliva, blood and urine using collection kits and the biomedical (MBI) protection kit, to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The*

strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected at intervals during the collection day using a specialized book that contains filter paper. The liquid saliva collections require that the crewmember soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations. The on-orbit blood samples are collected right before undocking and returned on the Shuttle so that analysis can occur with 48 hours of the sampling. This allows assays that quantify the function of different types white blood cells and other active components of the immune system. For cold storage, samples are secured in the MELFI (Minus-Eighty Laboratory Freezer for ISS). Also included are entries in a fluid/medications intact log, and a stress-test questionnaire to be filled out by the subject at begin and end. Urine is collected during a 24-hour period, conventionally divided into two twelve-hour phases: morning-evening and evening-morning.]

As part of ongoing COL commissioning, mostly by MS3 Hans Schlegel, CDR Whitson took time to verify that both C&W/MAL (Caution & Warning/Master Alarm Light) panels in the new module are functional.

With the larger part of her work schedule dedicated to the new FSL (Fluid Science Laboratory), Peggy Whitson first reviewed installation procedures, then set up FSL in its rack in the COL module and configured it for operation, including mating to UIP (Utility Interface Panel, or "Z-panel"), removing front launch fixations, setting up VMU (Video Management Unit), and removing a front gap protection fixture. *[Background: FSL is a multi-user facility, designed by ESA (European Space Agency) and built by Thales Alenia Space in Turin, Italy, for conducting fluid physics research in microgravity conditions. It can be operated in fully- or in semi-automatic mode and can be controlled on-board by ISS crewmembers, or from the ground in telescience mode. FSL experiments will give insight into the physics of fluids in space, including aqueous foams, emulsions, convection, and fluid motions. Understanding how fluids behave in micro-G will lead to the development of new fluid delivery systems in future spacecraft. Under micro-G, fluids are subject to significantly reduced gravity-driven convection, sedimentation and stratification and fluid static pressure, allowing the study of fluid dynamic effects normally masked by gravity, including diffusion-controlled heat and mass transfer. The absence of gravity-driven convection eliminates the negative effects of density gradients (inhomogeneous mass distribution) that arise in processes involving heat treatment, phase transitions, diffusive transport or chemical reaction. Convection in terrestrial processes is a strong perturbing factor, the effects of which are seldom predictable with great accuracy and which dominate heat and mass transfer in fluids. Experiments are integrated into an FSL EC (Experiment Container). With a typical mass of 30-35 kg, and standard dimensions of 400x270x280 mm^3, the EC provides ample space to accommodate the fluid cell assembly, including any necessary process stimuli and dedicated electronics.]*

Afterwards, Peggy moved to the EDR (European Drawer Rack) to mate its umbilical connections to the COL UIP. *[Background: EDR is a single six-post ISPR (International Standard Payload Rack) with 7 Experiment Modules (EMs), each with its own power & cooling, plus a VMU (Video Management Unit) which will send streaming video, images*

and high rate science data to Earth via the COL's high rate data link. It will also have the capability to store 72 GB of video temporarily. It assumes that the payloads onboard will be largely autonomous to minimize data transfer requirements. Cooling and power will be provided along with a way to transmit data back to earth. Data will be sent via the Video Management Unit (VMU) and the Rack Interface Controller (RIC) to the Columbus sending module and then to earth. There will be an air cooling system for each drawer, as well as access to water cooling, vacuum, venting and nitrogen, if necessary. The EMs come in two types: standard ISS locker and standard 8 PU ISIS drawer.]

Next item on Whitson's "inspection tour" inside COL was to check out the EDR's fire warning system, by testing and verifying the functionality of the Rack Fire Indicators (RFIs).

FE-1 Yuri Malenchenko worked through a long list of standard maintenance/service tasks on Russian Segment (RS) systems, completing –

- The current extended performance check of the KRIOGEM-03M refrigerator system, powered up on 2/12 to -22 degC, for once-daily monitoring of its displayed temperature for the next five days (through 2/17), in anticipation of upcoming experiment activities,
- The daily monitoring, picture-taking & downloading on the BIO-5 Rasteniya-2 ("Plants-2") experiment which researches growth & development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse,
- Taking the periodic readings of potentially harmful contaminants in the Service Module (SM) using the SKDS CMS (Pressure Control & Atmosphere Monitoring System/Countermeasure System) which uses preprogrammed microchips to measure Formaldehyde (H_2CO, methanal), Carbon Monoxide (CO) and Ammonia (NH_3),
- The periodic (generally monthly) service of the ESA/RSC-Energia experiment ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS), removing its PCMCIA memory card (#942) from the AST spectrometer and replacing it with a new card (#943),
- The periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS hatch openings (8) in the SM, FGB and DC1 (Docking Compartment),
- Inspecting the Russian de-ionized water container (KOV EDV), used for supplying water to the Elektron oxygen (O_2) generator for electrolysis, for bubbles and possible need for filling up with U.S. condensate from a CWC (Contingency Water Container, #1070),
- Setting up the KUBIK-3 thermally controlled incubator in the Soyuz TM- Orbital Compartment for monitoring it at a set temperature of +37 degC , then switching it to +6 degC for running overnight,
- Completing the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, and
- Performing the daily IMS (Inventory Management System) maintenance, updating/ editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Yuri Malenchenko also performed his first session of the ETD (Eye Tracking Device) experiment, which studies the coordination of eye and head movements in zero-G, i.e. the adaptation of the human vestibular (balance) system, and takes place in the DC-1's central sphere. *[After its initial calibration with the calibrating unit, the experiment investigates horizontal eye and head movement coordination, measures Listing's plane, and determines the orientation of the vestibulo-ocular coordinate system, using five target marks on a visual target board on the EV-2 hatch on the horizontal plane. For the experiment, Yuri first had to check the setup of the left and right video cameras, then establish his most comfortable and stable body position relative to the visual target (60 cm for the first part of the experiment, 100 to 150 cm in parts two & three). Each step requires another prior calibration run, using visual target cues or the calibration unit.]*

CDR Frick and PLT Poindexter continued filling CWCs (Contingency Water Containers) in Atlantis and moving them to the ISS, today transferring the 10th CWC.

FE-2 Dan Tani had an hour reserved for unpacking STS-122/1E cargo, supported by an uplinked Unpack List and the IMS.

The FE-2 also configured and programmed the IWIS (Internal Wireless Instrumentation System), verifying proper functionality of its RSUs (Remote Sensor Units) spread throughout the station and NCU (Network Control Unit), to measure structural dynamics disturbances (accelerations/vibrations) during tomorrow's scheduled reboost of the mated stack by the Shuttle. IWIS will be left in place to record dynamics data also during the Shuttle undocking on 2/18.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Malenchenko later transferred the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

During today's spacewalk by Rex & Stan, PLT Alan Poindexter again provided IVA support, while MS1 Melvin, FE-2 Tani & FE-2-16 Eyharts operated the SSRMS (Space Station Remote Manipulator System) for the hardware transfers (SOLAR, CMG, EuTEF).

After the spacewalkers' ingress at 3:32pm, post-EVA activities by CDR Steve Frick, CDR Peggy Whitson, Love and Walheim in the A/L consisted of recharging the EMU/spacesuits with water from PWR (Payload Water Reservoir), then reconnecting the LTAs (Lower Torso Assemblies) to the EMUs and capping the UIA (Umbilical Interface Assembly), initiating and monitoring the regeneration of the METOX (Metal Oxide) CO_2 filter canisters, initiating the discharge/recharge process on the EMU batteries in the BSA (Battery Stowage Assembly), and reconfiguring EVA tools.

At ~4:30am EST, Hans Schlegel & Leo Eyharts conducted a brief private phone call/ exchange with attendees at an ESA Council Meeting.

Transfers: As of today, 10 filled CWCs (Contingency Water Containers, contents ~45 L each) and 4 PWRs (Payload Water Reservoirs) were transferred from the Shuttle to ISS. Nitrogen transfer was completed, with 27 lbs N_2 transferred to the station. Even with the additional mission extension by one day, ~70 lbs of oxygen (O_2) will be available for transfer on FD10.

Reboost: Tomorrow morning's reboost of the mated stack by the Orbiter is scheduled for 7:17am, to establish the correct phasing conditions for Soyuz 15S landing, Soyuz 16S launch and the next Shuttle mission, STS-123/1JA. Nominal delta-V ~1.3 m/s, burn duration 36 min 0 sec. Expected altitude increase ~2.3 km/1.2 nmi.

Weekend Voluntary Science: For the voluntary "Saturday Science" program on 2/16-17, Peggy and Dan were offered for their choice: (1) a session with the InSPACE-2 experiment; (2) an EPO (Education Payload Operation)-Demo of Science Research aboard ISS, and (3) SWAB (Surface, Water and Air Biocharacterization) collections of air & surface samples. Crew selection is required ASAP.

No CEO photo targets uplinked for today.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

Significant Events Ahead *(all dates Eastern Standard, some changes possible.):*

- 02/16 (FD 10) -- Cargo transfers; COL activities & Commissioning; Reboost;
- 02/17 (FD 11) -- Cargo transfers; close hatches in preparation for undocking;
- 02/18 (FD 12) -- Undock from ISS (~4:26am ET); perform final OBSS berthing;
- 02/19 (FD 13) -- Stow cabin; checkout Shuttle flight control systems;
- 02/20 (FD 14) -- . Prepare for and perform deorbit burn; land at KSC (nominal) ~9:06am ET

02/28/08 -- ISS Reboost
03/07/08 -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana) (~11:23pm EST); docking 04/03
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/12/08 -- ATV CAM (Collision Avoidance Maneuver) demo
03/13/08 -- STS-123/Endeavour/1J/A docking
03/18/08 -- ATV1 parking orbit (loiter)

03/25/08 -- STS-123/Endeavour/1J/A undocking
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 – STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/14/08
Date:	Thursday, February 14, 2008 2:23:40 PM
Attachments:	

ISS On-Orbit Status 02/14/08

All ISS systems continue to function nominally, except those noted previously or below. *Mission 1E Flight Day 8 (FD8)*.

Crew sleep cycle shifted one hour earlier: 3:45am – 7:15pm for both crews.

Last night, Mission 1E was extended by one day (13+0+2), with landing now on Wednesday 2/20 at ~9:03am EST (if at KSC).

Columbus final activation has been completed.

After yesterday's command queue lockup between the COL CCS (Columbus Orbital Laboratory Command & Control System) and the COL MMC (Mission Management Computer), final activation of COL data management systems was accomplished late last night by transitioning/swapping the primary & backup C&C MDM (Multiplexer/ Demultiplexer) computers. *[The MMC is the intermodule interface computer required between the US C&DH (Command & Data Handling) system and the COL DMC (Data Management Computer) which handles equipment monitoring]*

With IMV (Intermodular Ventilation) and smoke detector function established, the crew continued COL outfitting and activation**,** including:

- Activation of the PWS (Portable Workstation) computer,
- Installation & activation of PCS (Portable Computer System) laptops,
- Relocation of the Biolab (BLB) from its launch location to its ISPR (International Standard Payload Rack) plus installing its DC converter, and
- Installation of VCA (Video Camera Assembly) 1 & 2.

Other outfitting activities completed by last night ahead of timeline included -

- Unlocking the anti-vibration mounts for the WPA (Water Pump Assembly) and CWSA (Condensate Water Separator Assembly),
- Relocating the EDR (European Drawer Rack) from its launch position to its operational location,
- Removing anti-vibration bolts on the CFA (Cabin Fan Assembly),
- Installing a ZSR (Zero-G Stowage Rack) in COL, and
- Rotating the COL D1 Rack to gain access to payload stowage locations and

recording a video of the activities for subsequent downlink to COL-CC (Columbus Orbital Laboratory Control Center) in Oberpfaffenhofen).

[Biolab (Biological Experiment Laboratory in Columbus) is a biological and physiological facility for studying the effects of microgravity on microorganisms, cells, tissue cultures, small plants and small invertebrates. EDR is a multi-discipline facility that provides an opportunity for compact experiments of low mass, supporting a variety of small payloads. Each payload will have access to power, data communications, cooling among other accommodations.]

Today, CDR Whitson completed COL vestibule outfitting by installing the nitrogen (N_2) supply jumper/hose between Node-2 and COL, followed by purge of the N_2 system to remove any contamination from the lines.

To prepare for providing COL power to the externally mounted MISSE (Materials ISS Experiment) payload coming up on Mission 1J/A, Leo Eyharts swapped a 20 amp fuse with a 3 amp fuse in the COL PPSB (Payload Power Switch Box).

Before breakfast, for the last time FE-2 Dan Tani completed his daily access of the SLEEP experiment (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop for downlink. *[To monitor the crewmember's sleep/wake patterns and light exposure, Dan wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

For today's recording and ground-commanded downlinking of onboard video, Peggy Whitson inserted and swapped tapes in the two VCRs (Video Cassette Recorders), 1&2.

Whitson had ~1hr set aside for troubleshooting the failed video connection for the ORB-1 video channel from the Shuttle to ISS via the ISS CVIU-10 (Common Video Interface Unit #10) in Node-2. *[For the IFM (In-flight Maintenance), the CDR accessed the base of Harmony's S4 rack and used pin kit jumpers to cross-wire CVIU-10 video transmit/receive cables for continuity testing. If this test was unsuccessful, Peggy was to extend the testing to other parts of the cabling.]*

Later, Peggy performed a pre-EVA video check by routing a Shuttle view to a Lab RWS (Robotic Workstation) monitor and checking picture quality.

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FE-1 Malenchenko hooked up the necessary "plumbing" and compressor for transferring potable water from the BV2 tank of Progress M-63/28P to the SM Rodnik BV2 water tank. *[The water transfer, monitored by Yuri several times during the day, at first was by self-flow (under its own tank pressure), then using the compressor pump via a GZhS gas/liquid separator, to remove air bubbles in the water. Filling of the empty Progress BV1 & BV2*

tanks with urine will be scheduled later.]

Starting a new round of RS ventilation system maintenance, the FE-1 worked in the Service Module (SM), replacing the four dust collector filters (PF1-4) and cleaning “Group A” fan grilles.

For tomorrow’s EVA-3 by MS2/EV1 Walheim and MS4/EV3 Love, final preparations by Tani, Rex & Stan today included -

- Reconfiguring two DCS 760 digital still cameras for the spacewalk, leaving them connected to station power for now to conserve batteries, one with 28mm lens and a new EVA Action Finder unit, the other with 35mm lens and an EVA flash,
- Setting up three batteries in the A/L BSA (Airlock Battery Stowage Assembly) for charging during the prebreathe period and to be installed in the photo equipment prior to egress,
- Starting EMU battery charge,
- Powering down onboard amateur (ham) radio equipment (Kenwood in SM, Ericsson in FGB) to prevent RF (radio frequency) interference with the EMU (Extravehicular Mobility Unit)/spacesuits,
- Preparing the A/L EL (Equipment Lock) for the Campout & spacewalk,
- Closing out METOX regeneration in the A/L bake-out oven, and
- Reviewing EVA-3 procedures particulars.

Peggy also prepared a special EVA swatch tool for a late-added touch inspection of an A/L handrail (#506) with a possibly sharp edged MMOD impact spot. *[The touch tests, supported by close-up photography, will use four swatch samples stroked firmly over the area of interest, once in each of four directions – RTV (Room Temperature Vulcanizing) material and Vectran on the swatch tool plus RTV and Vectran on a surplus overglove (on hand).]*

Whitson, Tani, Malenchenko and the two spacewalkers underwent the standard PMC (Private Medical Conference) via S- & Ku-band audio/video.

Dan Tani closed the Lab science window shutters as protection during today’s Atlantis thruster firings that set up attitude for the periodic water dump and also to protect the window during for tomorrow’s EVA.

The FE-1 continued the extended leak checking of the spare BZh Liquid Unit (#056) for the Elektron O_2 generator by checking the unit’s pressure and charging it once again with pressurized N_2 from the BPA-M Nitrogen Purge Unit (#23) to 1 atm (1 kg/cm^2). The last test pressurization was on 1/09. *[During Elektron operation, the inert gas locked up in the BZh has the purpose to prevent dangerous O_2/H_2 mixing. A leaking BZh cannot be used.]*

Yuri also conducted the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS hatch openings (8) in the SM, FGB and DC1 (Docking Compartment).

In preparation for upcoming experiment activities, Malenchenko continued the current extended performance check of the Russian KRIOGEM-03M refrigerator system, powered up on 2/12 to -22 degC with an AX ice pack from storage installed, for once-daily monitoring of its displayed temperature for the next five days (through 2/17).

Yuri also completed the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Later, the FE-1 handled the daily IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

At ~9:55am EST, the crew conducted a 20-min interactive TV "voice call" event with attendees at an ESA VIP gathering at the German Federal Ministry of Economics & Technology in Berlin, headed by Angela Merkel, the Chancellor of the Federal Republic of Germany, Jean-Jacques Dordain, ESA Director General, and Thomas Reiter as Moderator. The linkup and exchange, focused on the commissioning of the European Columbus laboratory and the resulting increasing salutary "internationalization" of the ISS, were very successful.

At ~11:10am, the ISS crew also engaged in three live TV/PD-100 camcorder media interviews of about 6.5 min duration each, with NBC News (Tom Costello), WOI-TV (Elizabeth Erwin), and WBBM Radio (Steve Grzanich).

FE-2 Tani and FE-2-16 Eyharts had over 2.5 hrs scheduled top continue their handover activities as ISS 2nd flight engineers.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Malenchenko later transferred the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Rex Walheim (EV1) & Stan Love (EV3) will begin their "campout" (*nachalo desaturatsiy* = desaturation start) in the A/L with hatch closure and depressurization of the Crewlock (CL) from 14.7 to 10.2 psi at ~6:00pm (i.e., an hour earlier than yesterday), followed by mask prebreathe at ~6:00-7:15pm. Sleep time for the ISS crew begins at 7:15pm.

Following the usual hygiene break/with mask prebreathe for Rex & Stan at ~4:20-5:30am

tomorrow morning after spending the night on 10.2 psi, the A/L hatch will be closed again for EVA preps in 10.2 psi, followed by EMU purge and prebreathe in the EMUs. Afterwards, with CL depressurization and EV1/EV3 egress, EVA-3 nominally begins at ~8:35am EST. Alan Poindexter will support the spacewalk as IV (Intravehicular) crewmember, keeping tabs with the detailed activity steps and crib sheet, and Melvin, Tani & Eyharts will work the SSRMS (Space Station Remote Manipulator System) for the hardware transfers (SOLAR, CMG, EuTEF) . *[Objectives of the spacewalk are to transfer SOLAR (Solar Monitoring Observatory) and the EuTEF (European Technology Exposure Facility) to the COL EPF (External Payload Facility), and to retrieve the failed CMG (Control Moment Gyro) for stowage in the Shuttle PLB for return. Get-ahead tasks for EVA-3 include more inspection of the failed SARJ (Solar Alpha Rotary Joint) with close-up photography, inspection of a suspected damage divot or debris (with its removal with a wipe) and photography of the remaining 5 single covers that have not yet been inspected, with 4 of them to be sampled with a sticky tape.]*

Transfers: As of this morning, 7 filled CWCs (Contingency Water Containers, contents ~45 L each) and 4 PWRs (Payload Water Reservoirs) were transferred from the Shuttle to ISS. Nitrogen transfer was completed, with 27 lbs N_2 transferred to the station. Even with the additional mission extension by one day, 60 lbs of oxygen (O_2) will be available for transfer on FD10.

No CEO photo targets uplinked for today.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

Significant Events Ahead *(all dates Eastern Standard, some changes possible.):*

- 02/15 (FD 09) -- EVA-3 by Rex Walheim & Stan Love; COL activities & Commissioning;
- 02/16 (FD 10) -- Cargo transfers; COL activities & Commissioning; Reboost;
- 02/17 (FD 11) -- Cargo transfers; close hatches in preparation for undocking;
- 02/18 (FD 12) -- Undock from ISS (~7:05am ET); perform final OBSS berthing;
- 02/19 (FD 13) -- Stow cabin; checkout Shuttle flight control systems;
- 02/20 (FD 14) -- . Prepare for and perform deorbit burn; land at KSC (nominal) ~9:03am ET

03/07/08 -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana) (~11:23pm EST); docking 04/03
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/12/08 -- ATV CAM (Collision Avoidance Maneuver) demo
03/13/08 -- STS-123/Endeavour/1J/A docking

03/18/08 -- ATV1 parking orbit (loiter)
03/25/08 -- STS-123/Endeavour/1J/A undocking
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
08/28/08 – STS-125/Atlantis Hubble Space Telescope Service Mission 4 (SM4)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/16/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
10/18/08 -- STS-126/Discovery/ULF2 docking
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
12/04/08 -- STS-119/Discovery/15A launch – S6 truss segment
12/06/08 -- STS-119/Discovery/15A docking
12/15/08 -- STS-119/Discovery/15A undocking
04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/13/08
Date:	Wednesday, February 13, 2008 4:41:29 PM
Attachments:	

ISS On-Orbit Status 02/13/08

All ISS systems continue to function nominally, except those noted previously or below. *Mission 1E Flight Day 7 (FD7)*.

Crew sleep cycle remains at 4:45am EST – 8:15pm for both crews.

Mission 1E's EVA-2 was completed successfully by Rex Walheim & Hans Schlegel in 6h 45m, accomplishing all its objectives and get-aheads.
[During the spacewalk, Walheim (EV1) & Schlegel (EV2) removed the new NTA (Nitrogen Tank Assembly) from the Shuttle PLB (Payload Bay), "flew" it to the CETA (Crew & Equipment Translation Aid) cart for transfer to the P1 truss, installed it in place of the failed NTA, which they returned via CETA for stowage in the PLB, and performed Get-Aheads, viz.: Clean up Lab MMOD (Micrometeoroid/Orbital Debris Shield) & install Columbus Trunnion Covers.] Official start time of the spacewalk was 9:27am EST, about 8 min ahead of the timeline, and it ended at 4:12pm. Total EVA duration (PET = Phase Elapsed Time) was 6h 45min. It was the 103rd spacewalk for ISS assembly & maintenance and the 75th from the station (28 from Shuttle, 53 from Quest, 22 from Pirs) totaling 457h 56min, and the 7th for Expedition 16 (totaling 50h 04min). After today's EVA, a total of 127 spacewalkers (95 NASA astronauts, 21 Russians, and 11 astronauts representing Japan-1, Canada-4, France-1, Germany-2 and Sweden-3) have logged a total of 646h 18min outside the station on building, outfitting and servicing. It was also the 125th spacewalk involving U.S. astronauts.]

Final COL (Columbus Orbital Laboratory) activation procedures were put on hold for today due to an onboard computer issue between a C&C MDM (Command & Control Multiplexer/ Demultiplexer) computer and the MMC (Mission Management Computer). *[Clearing the command queue in the CCS (Command & Control System) memory, blocked by a bit that erroneously indicates the queue to be empty, is requiring MCC-Houston to create, test, uplink and execute a special command sequence "from scratch".]*

To establish ventilation allowing crew activities inside COL, COL-CC (Columbus Control Center) in Oberpfaffenhofen attempted a workaround by uplinking commands via VTC (Vital Telemetry Telecommand Computer) to cycle COL IMV (Intermodular Ventilation) valves and turn on the IRFA (IMV Return Fan Assembly), establishing module ventilation. The attempt was not satisfactory. At this time, there is no IMV, and smoke detection,

dependent on ventilation, is currently prime crew responsibility.

COL activation operations, on hold due to the CCS command issue, will deal mostly with moving European payload systems from their launch locations and setting them up at their operational rack positions. The work ahead by FE-2 Dan Tani & FE-2-16 Leo Eyharts is to include among else –

- Installing K-BAR capture mechanisms in COL and relocating a ZSR (Zero-G Stowage Rack) and its pivot fittings from position A2 to O3 (or F3 to O4) in COL,
- Rotating COL Rack D1 forward (away from the cell wall),
- Installing RPDA (Remote Power Distribution Assembly) items and a front panel on the Biolab (BLB),
- Relocating the BLB to its ISPR (International Standard Payload Rack) location & installing its DC converter,
- Tilting the D1 rack back and securing it,
- Relocating the EDR (European Drawer Rack) to its final ISPR position,
- Activating the PWS (Portable Workstation) in COL, and
- Setting up PCS (Portable Computer System).

[Biolab (Biological Experiment Laboratory in Columbus) is a biological and physiological facility for studying the effects of microgravity on microorganisms, cells, tissue cultures, small plants and small invertebrates. EDR is a multi-discipline facility that provides an opportunity for compact experiments of low mass, supporting a variety of small payloads. Each payload will have access to power, data communications, cooling among other accommodations.]

Before breakfast, FE-2 Dan Tani completed his daily access of the SLEEP experiment (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop for downlink. *[To monitor the crewmember's sleep/wake patterns and light exposure, Dan wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

As part of pre-EVA activities, Dan Tani closed the protective Lab science window shutters, while Yuri Malenchenko powered down the ham radio equipment in SM (Service Module) and FGB at ~6:30am EST to prevent RF interference with the EMUs during the spacewalk.

The FE-2 performed the periodic offloading of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling CWC (Contingency Water Container) #1062 with the collected water slated for processing. No samples required this time. *[Estimated offload time before termination (leaving ~6 kg in the tank): ~25 min.]*

Malenchenko used the standard pump/hose gear to collected a water sample of ~200 mL from the SM BV1 Rodnik storage tank for return to Earth.

Afterwards, the FE-1 activated the Russian KTsP2 (Central Post Computer 2) RS2 laptop with its new display software, installed yesterday, for backup, before working on the KTsP1 RS3 laptop to repeat the software upgrade from a flash drive, then making a backup copy.

Yuri also conducted the periodic (currently daily) checkout/verification of IP-1 airflow sensors in the various RS (Russian segment) hatch openings (8) in the SM, FGB and DC1 (Docking Compartment).

Later, Malenchenko transferred the ATV (Automated Transfer Vehicle) control panel (PU) to its operational location and installed it.

The FE-1 continued his work with the Russian KPT-2 science payload BAR-RM, Kelvin, Ira and TTM, begun yesterday, today running tests and taking the first measurements (temperatures, relative humidity, dew point temperatures), using the RSK1 laptop (which he reconfigured afterwards). The data are being used for experimenting with ISS leak detection based on environmental data anomalies (temperature, humidity, and ultrasound emissions) at leak locations. After the data gathering, downlinking was via BSR-TM channel. *[BAR-RM is designed to develop a procedure for detection of air leakage from ISS modules based on environmental data anomalies (temperature, humidity, ultrasound emissions). The payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/thermometer (TTM-2), an ultrasound analyzer (AU-01), and a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station. Measurements are taken in specific zones (13 in SM PkhO and 4 in DC1), both with lights & fans turned on and off.]*

During today's spacewalk by Rex & Hans, PLT Alan Poindexter provided IVA support, while MS1 Leland Melvin and MS4/EV3 Stan Love worked the SSRMS (Space Station Remote Manipulator System) to assist with the NTA R&R (Removal & Replacement).

After the spacewalkers' ingress at 4:12pm, post-EVA activities by CDR Steve Frick, CDR Peggy Whitson, Schlegel and Walheim in the Joint Airlock (A/L) consisted of recharging the EMU/spacesuits with water from PWR (Payload Water Reservoir), then reconnecting the LTAs (Lower Torso Assemblies) to the EMUs and capping the UIA (Umbilical Interface Assembly), initiating and monitoring the regeneration of the METOX (Metal Oxide) CO_2 filter canisters, initiating the discharge/recharge process on the EMU batteries in the BSA (Battery Stowage Assembly), and reconfiguring EVA tools.

In preparation for upcoming experiment activities, FE-1 Yuri Malenchenko continued the current extended performance check of the Russian KRIOGEM-03M refrigerator system, powered up yesterday to -22 degC with an AX ice pack from storage installed, for once-daily monitoring of its displayed temperature for the next five days (through 2/17).

Yuri also completed the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO*

solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]

Working off his discretionary “time permitting” task list, the FE-1 handled the daily IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Other voluntary items on Yuri’s “job jar” list for today were -

- The daily monitoring, picture-taking and downloading on the newly set up BIO-5 Rasteniya-2 ("Plants-2") experiment. *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. During the duration of the BIO-5 experiment, students of the Moscow City Palace for Youth Creativity of the Meshchansky inter-regional center #15 in Moscow) and the Prince of Oldenburg Lyceum in St. Petersburg will be cultivating plants in parallel on the ground and conducting comparative observation of plant growth and development under gravity and zero-gravity conditions. They are receiving the photo images taken by Yuri.],* and
- The regular checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder). *[This is a daily monitoring/temp checking, carried on the Russian voluntary task list for the duration of Expedition 16.]*

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Malenchenko later transferred the crew’s exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

ETCS Shutdown: Loop A of the ISS ETCS (External Thermal Control System) suffered an inadvertent shutdown yesterday afternoon after the begin of COL MTL IFHX (Moderate Temperature Loop Interface Heat Exchanger) integration into the ETCS Loop A. The shutdown occurred when the loop’s flow control valve was unable to compensate for a warm (~65 degC) slug of ammonia passing through the system from the first IFHX that was discovered to have been left powered on (to provide extra margin against freezing). After recovery of the ETCS loop per procedure, the heater was deactivated and both COL IFHXs were integrated without further incident.

No CEO photo targets uplinked for today.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

Significant Events Ahead *(all dates Eastern Standard, some changes possible.):*

- 02/14 (FD 08) -- Continue COL Module outfitting; crew off-duty period;
- 02/15 (FD 09) -- EVA-3 to transfer the SOLAR (Solar Monitoring Observatory) and the EuTEF (European Technology Exposure Facility) to the COL Module external payload facility, and to retrieve a failed CMG (Control Moment Gyro) and stow for return;
- 02/16 (FD 10) -- Cargo transfers; close hatches in preparation for undocking; reboost (TBD)
- 02/17 (FD 11) -- Undock from ISS (~7:05am ET); perform final OBSS berthing;
- 02/18 (FD 12) -- Stow cabin; checkout Shuttle flight control systems;
- 02/19 (FD 13) -- Prepare for and perform deorbit burn; land at KSC (Nominal Landing) ~10:17am ET.

03/07/08 -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana) (~11:23pm EST); docking early April
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/12/08 -- ATV CAM (Collision Avoidance Maneuver) demo
03/13/08 -- STS-123/Endeavour/1J/A docking
03/18/08 -- ATV1 parking orbit (loiter)
03/25/08 -- STS-123/Endeavour/1J/A undocking
03/29/08 -- ATV1 Demo Day 1
03/31/08 -- ATV1 Demo Day 2
04/03/08 -- ATV1 Demo Day 3 (docking)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)

09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/06/08 -- STS-119/Discovery/15A launch – S6 truss segment
11/08/08 -- STS-119/Discovery/15A docking
11/17/08 -- STS-119/Discovery/15A undocking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/12/08
Date:	Tuesday, February 12, 2008 3:50:57 PM
Attachments:	

ISS On-Orbit Status 02/12/08

All ISS systems continue to function nominally, except those noted previously or below. *Mission 1E Flight Day 6 (FD6)*.

Congratulations, ESA! At ~9:15am EST, the European Columbus laboratory was opened and entered by crewmembers for the first time. *[Columbus is permanently attached at the starboard port of Node-2.]*

Crew sleep cycle remains at 4:45am – 8:15pm for both crews.

Before breakfast, FE-2 Dan Tani completed his daily access of the SLEEP experiment (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop for downlink. *[To monitor the crewmember's sleep/wake patterns and light exposure, Dan wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

CDR Peggy Whitson and FE-2-16 Leo Eyharts continued their IMMUNO (Integrated Immune Assessment) experiment, begun on 2/9, with liquid saliva collections, first thing after wake-up and prior to breakfast, drinking and teeth-brushing. All samples were stored at ambient temperature. Dan Tani's IMMUNO liquid saliva collection starts tomorrow morning. *[IMMUNO (Integrated Immune Assessment)is a 24-hr. test of human immune system changes, with the objective to investigate immune neuro-endocrine reactions in the space environment by studying samples of saliva, blood and urine using collection kits and the biomedical (MBI) protection kit, to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected at intervals during the collection day using a specialized book that contains filter paper. The liquid saliva collections require that the crewmember soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations. The on-orbit blood samples are collected right before undocking and returned on the Shuttle so that analysis can occur with 48 hours of the sampling. This allows assays that quantify the function of*

different types white blood cells and other active components of the immune system. For cold storage, samples are secured in the MELFI (Minus-Eighty Laboratory Freezer for ISS). Also included are entries in a fluid/medications intact log, and a stress-test questionnaire to be filled out by the subject at begin and end. Urine is collected during a 24-hour period, conventionally divided into two twelve-hour phases: morning-evening and evening-morning.]

In preparation for upcoming experiment activities, FE-1 Yuri Malenchenko activated the Russian KRIOGEM-03M refrigerator system for an extended performance check, powering it up to -22 degC with an AX ice pack from storage installed, then monitoring its displayed temperature for the next five days (through 2/17) once a day before sleeptime.

Afterwards, Yuri made preparations for a software upgrade of the CPC1 (Central Post Computer) RS2 laptop by loading newly OCA-uplinked software (for updated displays) onto an USB flash drive. Installation of the file contents from the flash drive in RS2 is scheduled tomorrow.

The FE-1 also collected condensate water (KAV) upstream of the FGS (Gas-Liquid Mixture Filter) of the SRV-K2M (Condensate Water Recovery System) in empty drink bags for return to Earth.

Whitson and Tani meanwhile finished the Node-2 O_2 (oxygen) system leak check, then terminated the leak check of the Harmony-to-Columbus vestibule.

In preparation for Columbus hatch opening and ingress, Peggy and Dan worked jointly to –

- Remove the center CBM (Common Berthing Mechanism) disk cover and thermal cover after opening the Node-2 hatch,
- Install electrical grounding straps,
- Disconnect Node-2/Columbus ITCS QD (Internal Thermal Control System Quick Disconnect),
- Install Columbus power jumpers and
- Remove all CPA (Control Panel Assembly) power jumpers (J1, J2, J3, J4).

After hatch opening and first crew ingress in Columbus at ~9:15am, Peggy, Dan and Leo continued outfitting Columbus. Among else, they –

- Installed hardwired instrumentation jumpers and connect 1553 data cables,
- Removed forward, aft, overhead & deck Node-2 CPA panels,
- Installed IMV (Intermodular Ventilation) airducts,
- Installed condensate water hose,
- Removed the aft NPRV (Negative Pressure Relief Valve) valve, replacing it with an IMV valve,
- Installed fiber optics cable, SDS (Sample Delivery System) and IMV return line,
- Transferred two PFEs (portable fire extinguishers) and two PBAs (portable breathing apparatus) to Columbus,
- Installed Partition Support Posts, and
- Installed the Ethernet cable and IVA (Intravehicular Activity) antenna assembly.

The FE-1 meanwhile conducted the periodic checkout/verification of IP-1 airflow sensors in the various RS (Russian segment) hatch openings (8) in the SM (Service Module), FGB and DC1 (Docking Compartment).

Upon Columbus (COL) hatch opening, Malenchenko took samples using the Russian IPD Draeger tubes and AK-1M samplers, testing for CO (Carbon Monoxide) in the SM & COL and for Formaldehyde (H_2CO, methanal) in COL. At the same time, Eyharts collected samples with the U.S. CSA-CP (Compound Specific Analyzer- Combustion Products) and GSC (Grab Sample Container). The FE-1 prepacked the air samples for return on the Shuttle.

FE-2 Tani deployed the new EMER-1 SODF (Station Operations Data File) emergency procedures book for Columbus.

Malenchenko set up the Russian KPT-2 science payload BAR-RM, Kelvin, Ira and TTM, to be used for experimenting with ISS leak detection based on environmental data anomalies (temperature, humidity, and ultrasound emissions) at leak locations. Data gathering will take place in the next two days using the RSE-1 laptop, with downlinking via BSR-TM channel. *[BAR-RM is designed to develop a procedure for detection of air leakage from ISS modules based on environmental data anomalies (temperature, humidity, ultrasound emissions). The payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/thermometer (TTM-2), an ultrasound analyzer (AU-01), and a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station. Measurements are taken in specific zones (13 in SM PkhO and 4 in DC1), both with lights & fans turned on and off.]*

Yuri Ivanovich also completed the 2.5-hr Part 2 of his first onboard “Profilaktika” (MBI-8, “Countermeasures”) series of preventive health maintenance fitness testing, including ECG (Electrocardiogram), blood test and subjective rating. *[Today’s fitness test was performed on the TVIS treadmill in unmotorized (idle) mode, with free choice of speeds within the range permitted. The test investigates the action mechanism and efficiency of various countermeasures (currently VELO and TVIS) aimed at preventing locomotor system disorders in weightlessness. The test differs from the normal TVIS session by the use of the TEEM-100 gas analyzer (via a mask equipped with a pneumotachometer sensor), measurement of blood lactate level and subjective evaluation of physical exertion levels during the test. The lactate blood samples were taken twice at the end of the session, using the ACCUSPORT analyzer and REFLOTRON-4 accessories. Results were entered on a log sheet. TEEM and ECG (electrocardiograph) data were transferred to the RSE-Med laptop, also on a tape cassette (Cardiocassette-2000), and prepared for later downlink via Regul-Packet comm. Results were also called down via S-band to specialists standing by at TsUP-Moscow.]*

Dan Tani reconfigured the DCS-760 EVA cameras and initiated charging of their batteries.

Malenchenko completed the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Working off his discretionary "time permitting" task list, Yuri conducted the daily monitoring, picture-taking and downloading on the newly set up BIO-5 Rasteniya-2 ("Plants-2") experiment. *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. During the duration of the BIO-5 experiment, students of the Moscow City Palace for Youth Creativity of the Meshchansky inter-regional center #15 in Moscow) and the Prince of Oldenburg Lyceum in St. Petersburg will be cultivating plants in parallel on the ground and conducting comparative observation of plant growth and development under gravity and zero-gravity conditions. They are receiving the photo images taken by Yuri.]*

Also suggested on Yuri's Russian voluntary "job jar" list for today was the regular checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder). *[This is a daily monitoring/temp checking, carried on the Russian voluntary task list for the duration of Expedition 16.]*

Leo Eyharts updated the TVIS exercise protocol for his future use of the device as new FE-2.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS (CDR, FE-1), and RED resistive exercise device (CDR, FE-2).

Afterwards, Yuri copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Rex Walheim (EV1) & Hans Schlegel (EV2) will begin their "campout" (*nachalo desaturatsiy* = desaturation start) in the Airlock (A/L) with hatch closure and depressurization of the Crewlock (CL) from 14.7 to 10.2 psi at ~7:00pm, followed by mask prebreathe at ~7:00-8:15pm. Sleep time for the ISS crew begins at 8:45pm.

Following the usual hygiene break/with mask prebreathe for Rex & Hans at ~5:20-6:30am tomorrow morning after spending the night on 10.2 psi, the A/L hatch will be closed again for EVA preps in 10.2 psi, followed by EMU purge and prebreathe in the EMUs.

Afterwards, with CL depressurization and EV1/EV2 egress, EVA-2 nominally begins at ~9:35am EST. Frick & Whitson will support the spacewalk as IV (Intravehicular) crewmembers, keeping tabs with the detailed activity steps and crib sheet. *[Objectives of the spacewalk are to (1) Remove new NTA (Nitrogen Tank Assembly) from Shuttle PLB (Payload Bay), (2) Transfer ("fly") the NTA to the CETA (Crew & Equipment Translation Aid) cart for transfer to the P1 truss, (3) Replace old NTA with new NTA, (4) Return old NTA for stowage in PLB, (4) Perform Get-Aheads, viz.: Install Lab MMOD (Micrometeoroid/ Orbital Debris Shield) & Columbus Trunnion Covers.]*

No CEO photo targets uplinked for today.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

Significant Events Ahead *(all dates Eastern Standard, some changes possible.):*

- 02/13 (FD 07) -- Perform more COL Module outfitting; EVA-2 to remove failed NTA from P1 truss and to install a new NTA plus Get-Aheads;
- 02/14 (FD 08) -- Continue COL Module outfitting; crew off-duty period;
- 02/15 (FD 09) -- EVA-3 to transfer the SOLAR (Solar Monitoring Observatory) and the EuTEF (European Technology Exposure Facility) to the COL Module external payload facility, and to retrieve a failed CMG (Control Moment Gyro) and stow for return;
- 02/16 (FD 10) -- Cargo transfers; close hatches in preparation for undocking;
- 02/17 (FD 11) -- Undock from ISS (~7:05am ET); perform final OBSS berthing;
- 02/18 (FD 12) -- Stow cabin; checkout Shuttle flight control systems;
- 02/19 (FD 13) -- Prepare for and perform deorbit burn; land at KSC (Nominal Landing) ~10:15am ET.

03/07/08 -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana) (~11:23pm EST); docking early April
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)

08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/06/08 -- STS-119/Discovery/15A launch – S6 truss segment
11/08/08 -- STS-119/Discovery/15A docking
11/17/08 -- STS-119/Discovery/15A undocking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/11/08
Date:	Monday, February 11, 2008 6:17:41 PM
Attachments:	

ISS On-Orbit Status 02/11/08

All ISS systems continue to function nominally, except those noted previously or below.
Mission 1E Flight Day 5 (FD5). Underway: Week 17 of Increment 16.

Mission 1E's EVA-1 was completed successfully by Stanley Love & Rex Walheim in 7hr 58min, accomplishing all its objectives.
[During the spacewalk, Walheim (EV1) & Love (EV2) prepared Columbus for unberthing and installation, hooking up electric cables, removing protective covers from the module's docking mechanism and equipping Columbus with the PDGF (Power & Data Grapple Fixture) required for grappling. They also started preparing the NTA (Nitrogen Tank Assembly) for removal, preparatory to replacement with a new NTA on EVA-2 (disconnecting electric cables and two ammonia flex hoses was deferred to Wednesday, but Walheim unfastened two of the four bolts holding down the NTA). Official start time of the spacewalk was 9:13am EST, about 25 minutes ahead of the timeline, and it ended at 5:11pm. Total EVA duration (PET = Phase Elapsed Time) was 7h 58min. It was the 102nd spacewalk for ISS assembly & maintenance and the 74th from the station (28 from Shuttle, 52 from Quest, 22 from Pirs) totaling 451h 11min, and the 6th for Expedition 16 (totaling 43h 19min.) After today's EVA, a total of 125 spacewalkers (94 NASA astronauts, 21 Russians, and ten astronauts representing Japan-1, Canada-4, France-1, Germany-1 and Sweden-3) have logged a total of 639h 33min outside the station on building, outfitting and servicing. It was also the 124th spacewalk by U.S. astronauts.]

In addition, **ESA's Columbus Module was successfully installed on the Node-2 "Harmony" starboard dock at ~4:44pm.** *[FE-2 Dan Tani, MS1 Leland Melvin and MS-5 Leo Eyharts operated the SSRMS (Space Station Remote Manipulator System) to grapple, unberth, transfer and reberth Columbus at the Node-2 Stbd CBM (Common Berthing Mechanism) with the SSRMS in "limp" mode. All motorized bolts have engaged to firmly hold the science laboratory at its place, and leak checks are now being performed on the vestibule between Columbus and the Node-2 port. Ingress in Columbus is scheduled for tomorrow at ~ 2:55pm EST.]*

After wakeup at ~4:45am EST, ending the 8.5-hr sleep period before the spacewalk, the Airlock Crewlock (A/L CL) hatch was cracked at ~5:20am EST for a hygiene break/with mask prebreathe for Walheim and Love, after spending the night on 10.2 psi campout.

Around 6:30am, the hatch was closed again by IVs (Intravehicular Crewmembers) for EVA preparations in 10.2 psi, followed by EMU purge & prebreathe. Afterwards, IVs supported the CL depressurization and EV1/EV2 egress (EMUs switched to batteries at 9:13am).

Before breakfast, FE-2 Dan Tani completed his daily access of the SLEEP experiment (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop for downlink. *[To monitor the crewmember's sleep/wake patterns and light exposure, Dan wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Prior to EVA start, FE-1 Malenchenko verified powerdown of onboard ham radio equipment (Kenwood in SM & Ericsson in FGB) to prevent RF interference with the EMUs, as well as proper closure of the protective Lab window shutters.

At the Node-2 starboard hatch, FE-2 Tani powered up the CBCS (Centerline Berthing Camera System) which he had installed and checked out on 11/28/08 in preparation for today's Columbus berthing.

After last week's installation of the new EMI (Electromagnetic Interference) filter in the Elektron O_2 (oxygen) generator system, Malenchenko worked with the ground on activating of the Elektron at 32 amps, first pressurizing the BZh Liquid Unit with N_2 (nitrogen) via laptop and later monitoring the external temperature of its secondary purification unit (BD) for the first 10 minutes of operations to ensure that there was no overheating. *[During nominal operations a gas analyzer is utilized to detect hydrogen (H_2) in the O_2 line (which could cause overheating) but is not included in the control algorithm until 10 minutes after Elektron startup. The new EMI filter, recently (2/9) installed on the Elektron's current stabilizer (FPP ST-64), prevents RFI (radio frequency interference) with the ATV/Automated Transfer Vehicle).]*

The FE-1 conducted the fourth recharging of the Motorola Iridium-9505A satellite phone brought up on Soyuz 15S, a monthly routine job. *[After retrieving it from its location in the TMA-11/15S descent module (BO) at ~6:55am EST, Yuri initiated the recharging of its lithium-ion battery, monitoring the process every 10-15 minutes as it took place. Upon completion at ~8:15am, the phone was returned inside its SSSP Iridium kit and stowed it back in the BO's operational data files (ODF) container. The satphone accompanies returning ISS crews on Soyuz reentry & landing for contingency communications with SAR (Search-and-Rescue) personnel after touchdown (e.g., after an "undershoot" ballistic reentry). The Russian-developed procedure for the monthly recharging has been approved jointly by safety officials. During the procedure, the phone is left in its fire-protective fluoroplastic bag with open flap. The Iridium 9505A satphone uses the Iridium constellation of low-Earth orbit satellites to relay the landed Soyuz capsule's GPS (Global Positioning System) coordinates to helicopter-borne recovery crews. The older Iridium-*

9505 phones were first put onboard Soyuz in August 2003. The newer 9505A phone, currently in use, delivers 30 hours of standby time and three hours of talk, up from 20 and two hours, respectively, on the older units.]

In the Service Module (SM), Malenchenko installed the water sampler and performed part of the periodic water sampling for return to Earth, using empty drinking bags to collect condensate (KAV) samples upstream of the Water Purification Column Unit (SRV-K2M BKO).

Yuri also set up the hardware and conducted the first part of the onboard "Profilaktika" (MBI-8, "Countermeasures") preventive health maintenance fitness test, on the VELO bicycle ergometer. Part 2, on the TVIS treadmill, is scheduled tomorrow. *[Test procedure for MBI-8, which requires workouts on the VELO and TVIS, is identical to the Russian MO-5 assessment, but in addition to the nominal procedure it uses the TEEM-100M gas analyzer with breathing mask, a blood lactate test with the ACCUSPORT analyzer and REFLOTRON-4 accessories, and a subjective evaluation of physical exertion levels during the test (using the Borg Perceived Exertion Scale, viz., 10 steps from very light over hard and very hard to maximum). Results are entered on a log sheet. TEEM and ECG (electrocardiograph) data are transferred to the RSE-Med laptop, also on a tape cassette (Cardiocassette-2000), and prepared for later downlink via Regul-Packet comm. Results are also called down to specialists standing by at TsUP. Data from the previous session (1/3) were also to be transferred.]*

Two more CWC (Contingency Water Container) bags were filled in the Atlantis with water from the Shuttle's fuel cells by CDR Frick & PLT Poindexter and transferred to ISS.

Malenchenko worked on the RBO-3-1 Matryoshka-M radiation equipment in the DC1 Docking Compartment and removed 16 radiation dosimeters from the "Phantom" unit, packing 13 of the containers for return on the Shuttle and leaving three (##8, 13, 18) for continued support of the Bubble-Dosimeter experiment.

Also in the DC1, Yuri readied three smoke detectors (IDZ-2, "Electroinductive Detector 2"), to replace the current units, scheduled for tomorrow.

CDR Whitson supported the ESA experiment WAICO (Waving and Coiling of Arabidopsis Roots at Different g-levels) by inserting four (of eight) Shuttle-delivered SED seed containers in the MELFI (Minus-Eighty Laboratory Freezer for ISS), Dewar 4, Tray C/4. *[WAICO, contributed by Leibniz Universität in Hannover, Germany, will study the interaction of circumnutation (the successive bowing or bending in different directions of the growing tip of the stems and roots) and gravitropism (a tendency to grow toward or away from gravity) in microgravity and 1-g of* Arabidopsis thaliana *(commonly known as thale cress). MELFI exhibited an as-yet unexplained warm-up yesterday but its current temperature remains well within WAICO range, with WAICO samples being protected on both high and low side.]*

Whitson also continued preparations of the Node-2 starboard hatch transfer section

("vestibule") for Columbus docking by installing the VAJ (Vacuum Access Jumper) equipment for vestibule pressurization. After Columbus berthing, the equipment will be used for the standard one-hour leak checking.

In the Joint Airlock (A/L), Dan Tani, Rex Walheim and Stan Love performed post-EVA activities, including charging the EMU/spacesuits with water from PWR (Payload Water Reservoir) and CWC (Contingency Water Container) #1059, then reconnecting the LTAs (Lower Torso Assemblies) to the EMUs and capping the UIA (Umbilical Interface Assembly).

They also initiated and monitored regeneration of the two METOX canisters used for the Campout in the A/L bakeout oven and set up EMU batteries in the BSA (Battery Stowage Assembly) for recharge.

After Columbus berthing, Peggy Whitson will uninstall and remove the CBCS (Centerline Berthing Camera System) in Node-2 for stowage.

Dan Tani meanwhile will download the DCS-760 imagery resulting from the EVA.

The FE-1 continued cargo transfer and stowage activities from Progress M-63/28P to the ISS, while Frick and Poindexter accomplished more cargo transfers between Atlantis and ISS.

Malenchenko completed the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Working off his discretionary "time permitting" task list, Yuri conducted the daily monitoring, picture-taking and downloading on the newly set up BIO-5 Rasteniya-2 ("Plants-2") experiment. *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. During the duration of the BIO-5 experiment, students of the Moscow City Palace for Youth Creativity of the Meshchansky inter-regional center #15 in Moscow) and the Prince of Oldenburg Lyceum in St. Petersburg will be cultivating plants in parallel on the ground and conducting comparative observation of plant growth and development under gravity and zero-gravity conditions. They are receiving the photo images taken by Yuri.]*

Also suggested on Yuri's Russian voluntary "job jar" list for today was the regular checkup on the Japanese experiment GCF-JAXA (Granada Crystallization Facility) in the Russian TBU incubator, maintained at +20 degC, including a temperature check on its ART (automatic temperature recorder). *[This is a daily monitoring/temp checking, carried on*

the Russian voluntary task list for the duration of Expedition 16.]

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-2), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

No CEO photo targets uplinked for today.

CEO photography can be viewed and studied at the websites:
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Significant Events Ahead *(all dates Eastern Standard, some changes possible.):*

- 02/12 (FD 06) -- More FI (Focused Inspection) if required; prepare for and perform COL Module ingress;
- 02/13 (FD 07) -- Perform COL Module outfitting; EVA-2 to remove failed NTA from P1 truss and to install a new NTA;
- 02/14 (FD 08) -- Continue COL Module outfitting; crew off-duty period;
- 02/15 (FD 09) -- EVA-3 to transfer the SOLAR (Solar Monitoring Observatory) and the EuTEF (European Technology Exposure Facility) to the COL Module external payload facility, and to retrieve a failed CMG (Control Moment Gyro) and stow for return;
- 02/16 (FD 10) -- Cargo transfers; close hatches in preparation for undocking;
- 02/17 (FD 11) -- Undock from ISS; perform final OBSS berthing;
- 02/18 (FD 12) -- Stow cabin; checkout Shuttle flight control systems;
- 02/19 (FD 13) -- Prepare for and perform deorbit burn; land at KSC (Nominal Landing) ~9:59am EST.

03/07/08 -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana) (~11:23pm EST); docking early April
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04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
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08/07/08(NET) -- ATV-1 undocking (from SM aft port)

08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
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10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
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11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
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11/17/08 -- STS-119/Discovery/15A undocking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/10/08
Date:	Sunday, February 10, 2008 3:14:26 PM
Attachments:	image004.gif image005.gif image006.gif

ISS On-Orbit Status 02/10/08

All ISS systems continue to function nominally, except those noted previously or below.
Sunday --- Mission 1E Flight Day 4 (FD4). Ahead: Week 17 of Increment 16.

Mission 1E replanning by MCC-Houston, driven by the one-day delay of the first spacewalk, was completed last night, as follows:

- Approved mission extension by one day (i.e., 12+0+2 instead of 11+0+2), resulting in 2/19 (Tuesday) as return date for Atlantis;
- Limiting resource being oxygen (O_2), under further discussion is the option to either extend by one more docked day or transfer the unexpended O_2 to the ISS (current O_2 margins are estimated to be 11+1+2 plus an additional 20-25 hours. These are still being refined given the insertion of the new FD4);
- All FD 4 activities moved to FD 5. EVA-1 will be conducted by Stanley Love and Rex Walheim tomorrow, with Campout of the two tonight;
- Today (FD 4) was replanned and includes 1.5 hrs of focused inspection (FI) of the starboard OMS (Orbital Maneuvering System) pod blanket that has a corner slightly peeled back ***(see images below)*** *[the FI, starting at ~ 2:15 pm EST, is planned for 90 min, with additional FI time available on FD 06 if needed]*;
- Transfer status: 22% of transfer complete, 6 hours of transfer scheduled for FD 4, expect 35/40 lbs N2 transfer today, 3 CWCs filled.

Wakeup time for the ISS crew remains at 4:45am EST, with sleep time tonight 8:45pm. Same times for the Shuttle crew.

After wakeup and before breakfast, FE-2 Dan Tani completed his daily access of the SLEEP experiment (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop for downlink. *[To monitor the crewmember's sleep/wake patterns and light exposure, Dan wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days,*

as part of the crew's discretionary "job jar" task list.]

In Node-2, CDR Whitson performed a leak check on the O_2 supply line set up yesterday to allow flow of Shuttle O_2 to the ISS PBAs (Portable Breathing Apparatus) in support of pre-EVA mask prebreathe for denitrogenation.

The crew, particularly CDR Frick, PLT Poindexter, MS2 Walheim and MS4 Love, conducted an in-depth review of procedures for the EVA-1 spacewalk, with egress scheduled to start tomorrow morning at ~9:40am EST.

CDR Whitson, with Frick and Poindexter, initiated N_2 (nitrogen) transfer from the Orbiter to the ISS HPGTs (High-Pressure Gas Tanks) on the exterior of the U.S. Airlock (A/L). *[A total of ~40 lbs of N_2 was to be transferred to the ISS (until stopped by the HPGT counter pressure).]*

FE-1 Malenchenko transferred and replaced new Russian ODF (Operations Data Files) documents and updates from Progress 28P. *[The new material was inserted in five Procedures Books (SOZh Life Support System, SOGS Atmosphere Revitalization System, VKS Auxiliary Computer System, PTO VnuKD FGB IVA IFM (In-flight Maintenance) Part 1, and RPR TKG #363 Progress M-63 Cargo Transfer Ops.]*

Similarly, CDR Peggy Whitson transferred a CD (Compact Disk) storage box with new data files for the 1E stage from Atlantis to the ISS.

Malenchenko completed the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Yuri also handled the daily IMS (Inventory Management System) maintenance, updating/ editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

More CWC (Contingency Water Container) bags were filled in the Atlantis with water from the Shuttle's fuel cells by Frick & Poindexter for transfer to ISS.

Yuri Malenchenko performed a successful leak check on his Russian Sokol spacesuit.

More 1E cargo transfers from the Shuttle to ISS were handled by Poindexter, Frick and Whitson.

FE-2 Dan Tani, slated for return on the Atlantis on 2/19, and MS5 Léopold (Leo) Eyharts, who is to replace him as ISS FE-2, had 3h 15m scheduled for standard joint handover

activities, to be continued through the docked period ahead.

Tani downlinked the data from his two CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS) Actiwatches and body-worn Holter recorder.

EV1 Walheim & EV2 Love worked on their EMUs (Extravehicular Mobility Units), adjusting sizes and swapping components as required (MS3 Hans Schlegel being scheduled for spacewalk next week). Preparations for tomorrow's spacewalk included refilling the in-EMU DIDBs (Disposable In-suit Drink Bags). *[The DIDBs were filled yesterday with non-iodinated drinking water, good for 24 hr & intended for today. The postponement of EVA-1 to FD5 required a refill with fresh non-iodinated potable water.]*

Schlegel meanwhile checked out the REBA (Rechargeable EVA Battery Assembly)-powered EVA hardware in the Airlock (A/L), as Rex and Stan prepared the A/L Equipment Lock for their campout. See today's ***picture of Hans below***. *[Reminder: The U.S. A/L has two hatch-separated compartments: the Crew Lock (CL) and the Equipment Lock (EL).]*

In Node-2, Peggy prepared PCS (Portable Computer System) 120 Vdc UOP (Utility Outlet Panel) power for the spacewalk and verified correct A31p laptop function.

Whitson also started the outfitting of the Node-2 port vestibule for tomorrow's berthing of Columbus (COL). The vestibule outfitting will be continued over the next several days after the COL berthing.

Schlegel, Love & Tani each have a PFC (Private Family Conferences) on their schedule, via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-9 laptop), Stan at ~1:50pm, Hans at ~5:30pm, Dan at ~6:15pm.

At ~2:15pm EST, Shuttle crewmembers Leland Melvin (MS1), Frick, Poindexter and Love began the 2.5-hr. focused inspection of the starboard OMS pod with the detached corner of one of the TPS (Thermal Protection System) blankets. The resulting imagery will be downlinked later tonight for inspection by ground specialists. *[The forward corner of the blanket (~6 in x ~6 in) is peeled back and sticking up approximately 2 inches. There is no RTV visible and there is no structural rib underneath. Additionally, there is a loose portion of the blanket in the middle raised to an unknown height.]*

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

Yuri transferred the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Working off his discretionary "time permitting" task list, Malenchenko conducted the daily

monitoring, picture-taking and downloading on the newly set up BIO-5 Rasteniya-2 ("Plants-2") experiment. *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. During the duration of the BIO-5 experiment, students of the Moscow City Palace for Youth Creativity of the Meshchansky inter-regional center #15 in Moscow) and the Prince of Oldenburg Lyceum in St. Petersburg will be cultivating plants in parallel on the ground and conducting comparative observation of plant growth and development under gravity and zero-gravity conditions. They are receiving the photo images taken by Yuri.]*

Rex (EV1) and Stan (EV2) will begin their "campout" (*nachalo desaturatsiy* = desaturation start) in the A/L with hatch closure and depressurization of the CL from 14.7 to 10.2 psi at ~7:00pm, followed by mask prebreathe at ~7:00-8:15pm. Sleep time for the ISS crew begins at 8:45pm. *[For the Campout, METOX (Metal Oxide) canisters #0017 & #0019) have been installed in the A/L for CO_2 control.]*

Following the usual hygiene break/with mask prebreathe for Walheim & Love at ~5:20-6:30am tomorrow morning after spending the night on 10.2 psi, the A/L hatch will be closed again for EVA preps in 10.2 psi, followed by EMU purge and prebreathe in the EMUs. Afterwards, with CL depressurization and EV1/EV2 egress, EVA-1 nominally begins at ~9:40am EST. Frick & Poindexter will support the spacewalk as IV (Intravehicular) crewmembers, keeping tabs with the detailed activity steps and crib sheet.

Unberthing and transfer of the COL Module to its Node-2 CBM (Common Berthing Mechanism) by Dan Tani, Leo Eyharts and Leland Melvin will begin tomorrow at ~2:10pm.

No CEO photo targets uplinked for today.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

Significant Events Ahead *(all dates Eastern Standard, some changes possible.):*

- 02/11 (FD 05) -- EVA-1 to install PDGF (Power & Data Grapple Fixture) on Columbus (COL) Module, to unberth and install COL on starboard side of Node-2, and to prepare the P1 Truss NTA (Nitrogen Tank Assembly) for repair and replacement;
- 02/12 (FD 06) -- More FI (Focused Inspection) if required; prepare for and perform COL Module ingress;
- 02/13 (FD 07) -- Perform COL Module outfitting; EVA-2 to remove failed NTA from

P1 truss and to install a new NTA;

- 02/14 (FD 08) -- Continue COL Module outfitting; crew off-duty period;
- 02/15 (FD 09) -- EVA-3 to transfer the SOLAR (Solar Monitoring Observatory) and the EuTEF (European Technology Exposure Facility) to the COL Module external payload facility, and to retrieve a failed CMG (Control Moment Gyro) and stow for return;
- 02/16 (FD 10) -- Cargo transfers; close hatches in preparation for undocking;
- 02/17 (FD 11) -- Undock from ISS; perform final OBSS berthing;
- 02/18 (FD 12) -- Stow cabin; checkout Shuttle flight control systems;
- 02/19 (FD 13) -- Prepare for and perform deorbit burn; land at KSC (Nominal Landing) ~9:59am EST.

03/07/08 -- ATV-1 “Jules Verne” launch/Ariane V (Kourou, French Guyana); docking early April
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
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04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
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08/07/08(NET) -- ATV-1 undocking (from SM aft port)
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04/15/09 -- **Constellation's Ares I-X Launch**
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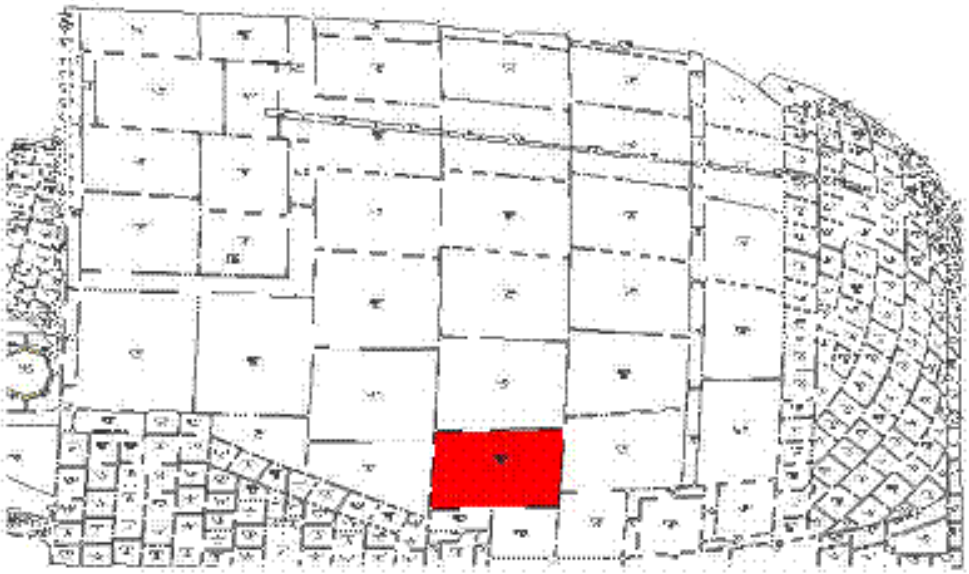
Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

Stbd OMS Pod TPS blanket

Stbd OMS Pod TPS blanket (location)



ESA Astronaut Hans Schlegel (MS3) – 2/10/08

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/09/08
Date:	Saturday, February 09, 2008 7:52:59 PM
Attachments:	

ISS On-Orbit Status 02/09/08

All ISS systems continue to function nominally, except those noted previously or below. Saturday – Docking Day. *Happy Birthday, Peggy Whitson!*

STS-122/Atlantis docked smoothly at the PMA-2 (Pressurized Mating Adapter-2) port at 12:17pm EST, eight minutes ahead of time, after successfully completing the RPM (R-Bar Pitch Maneuver) at 11:32am. The station now hosts ten occupants again as Mission 1E is underway. *[The combined crew is comprised of ISS CDR Peggy Whitson, FE-1 Yuri Malenchenko, FE-2 Dan Tani, STS CDR Steve Frick, PLT Alan Poindexter, MS1 Leland Melvin, MS2 Rex Walheim, MS3 Hans Schlegel, MS4 Stanley Love, and MS5 Léopold Eyharts who replaces Dan Tani as FE-2, while the latter returns on the Atlantis as MS-5.]*

Hook closure to rigidize the Shuttle-ISS linkup was at 12:43pm. After the docking, the station was reoriented as planned to minimize the risk of micrometeoroid/debris impacts upon the Shuttle (-x-axis in velocity vector, +z-axis in local vertical).

Hatches were open at 1:40pm, and the new crew was welcomed aboard the ISS and given the mandatory 25-min. safety briefing. Later, EVA/EMU equipment was transferred from the Shuttle to the ISS Airlock (A/L) as the SRMS (Shuttle Remote Manipulator System) handed over the grappled OBSS (Orbiter Boom Sensor System) to the ISS SSRMS (Space Station RMS) which then was “parked” overnight, whereas the SRMS maneuvered to Columbus Module (COL) viewing position.

In a last-moment timeline modification, EVA-1, originally scheduled for tomorrow and preceded by the regular Campout tonight, was postponed by one day and will now be conducted on Monday, 2/11, by Rex Walheim and Stan Love, who replaces Hans Schlegel. Ground teams are currently replanning FD4 (Flight Day 4) according to the mission priorities, and the Shuttle has initiated measures to protect cryo prop margin so that additional docked days can be added to the mission.

Due to the EVA-1 delay, the crew was able to complete several get-aheads from tomorrow’s plan, including: the Node-2/PMA-2 axial VBA (Vestibule Barrier Assembly) installation and Leo Eyharts’ IELK (Individual Equipment Liner Kit) installation in Soyuz 15S. Eyharts’ Sokol suit checkout is still scheduled for tomorrow. Dan Tani’s IELK was

uninstalled and was temporary stowed for return on a future flight.

Wakeup time for the ISS crew had shifted once more this morning, to 4:45am EST, for a long day (sleep time tonight: 8:45pm).

Preparatory to the Shuttle arrival, FE-2 Tani closed the Lab science window shutter as protection against thruster plumes. *[The window shutter must remain closed when Shuttle is within 3000 ft/915m of the ISS. It may be opened for no more than 15 minutes for photo documentation if the Shuttle is in Freedrift.]*

After wakeup and before breakfast, FE-2 Dan Tani completed his daily access of the SLEEP experiment (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop for downlink. *[To monitor the crewmember's sleep/wake patterns and light exposure, Dan wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

For her second session with the ESA/Russian biomed experiment "IMMUNO", Peggy Whitson set up the IMMUNO urine collection hardware and took air samples with the IPD-NH_3 Draeger tubes sampler, testing for ammonia (NH_3) in the SM, then started the experiment. *[IMMUNO (Integrated Immune Assessment) is a 24-hr. test of human immune system changes, with the objective to investigate immune neuro-endocrine reactions in the space environment by studying samples of saliva, blood and urine using collection kits and the biomedical (MBI) protection kit, to develop and validate an immune monitoring strategy consistent with operational flight requirements and constraints. The strategy uses both long and short duration crewmembers as study subjects. The saliva is collected in two forms, dry and liquid. The dry samples are collected at intervals during the collection day using a specialized book that contains filter paper. The liquid saliva collections require that the crewmember soak a piece of cotton inside their mouth and place it in a salivette bag; there are four of the liquid collections during docked operations. The on-orbit blood samples are collected right before undocking and returned on the Shuttle so that analysis can occur with 48 hours of the sampling. This allows assays that quantify the function of different types white blood cells and other active components of the immune system. Samples are secured in the MELFI (Minus-Eighty Laboratory Freezer for ISS). Also included are entries in a fluid/medications intact log, and a stress-test questionnaire to be filled out by the subject at begin and end. Urine is collected during a 24-hour period, conventionally divided into two twelve-hour phases: morning-evening and evening-morning.]*

Before the docking, CDR Whitson worked on the Node-2 O_2 (oxygen) supply line, purging it with N_2 (nitrogen) and configuring it to allow Shuttle to supply O_2 to the ISS PBAs (Portable Breathing Apparatus) in support of pre-EVA mask prebreathe for denitrogenation.

Also before the actual docking, FE-1 Malenchenko performed final STTS communications configuration checks for the docking. After the docking, Yuri switched USOS/RS (US Segment/Russian Segment) comm systems to their mated-flight mode.

Shortly before the docking, the crew configured the Russian MCS (Motion Control System) for the automatic "PMA-2 Arrival" mode, an operational sequence used to monitor Orbiter arrival at the PMA-2. *[At "Capture Confirmed", ISS attitude was immediately set to "free drift" to allow dampening out relative motions of ISS and Discovery (with the ODS dampers/ shock absorbers), then maneuvered to "Mated TEA" (Torque Equilibrium Attitude) to account for the new overall configuration with Discovery docked.]*

Docking took place at 12:17pm. After leak checks of the ODS (Orbiter Docking System) vestibule for about an hour, hatches were opened at 1:40pm, with the traditional ship's bell ringing. Hand shakes and hugs between the crews came 15 minutes later.

Before and during ISS/STS hatch opening, Yuri Malenchenko performed the standard collection of air samples with the Russian AK-1M sampler in the SM, FGB, Lab, and then also in the Orbiter.

Prior to the start of docked mission activities, CDR Whitson took care of the transfer of joint mission books from the Shuttle over to ISS. *[The new books, contained in a Ziploc bag and CTB (Crew Transfer Bag), include the SODF (Station Operations Data Files) procedures for the docked mission and emergency situations.]*

The FE-1 took air samples for the periodic (currently daily) atmospheric status check for ppO_2 (Partial Pressure Oxygen), using the hand-held CSA-O_2 (Compound Specific Analyzer-Oxygen) sensors that were readjusted on 1/22. Batteries were to be replaced if necessary. *[CSA-O_2s #1041 & #1052 were to be activated (if not already on) for taking readings in the Lab. Afterwards, both units were to be turned off and returned to their stowage. Purpose of the ~25-min activity is to trend with MCA (Major Constituents Analyzer), i.e., to correlate the hand-held readings with MCA measurements, prior to US EVA-14 scheduled for next Wednesday. Daily CSA- O_2 readings will be compared to the MCA to ensure the hardware is operating to a known calibrated device. Two CSA- O_2s are required to support the Airlock campout for the upcoming 1E EVA-1.]*

CDR Whitson and Shuttle PLT Poindexter filled CWCs (Contingency Water Containers) and transferred them to the ISS.

Whitson and Poindexter also configured the BPSMU (Battery Powered Speaker Microphone Unit) by installing the ISS- and Shuttle-side string of cables with a dragthrough QD (quick disconnect).

The FE-1 worked on the Elektron O_2 generator system, installing a new Progress-delivered electronic interference filter, designed to prevent RFI (radio-frequency interference) with

the ATV/Automated Transfer Vehicle. *[On 12/21/07, when Yuri assisted the ground in activation the Elektron in the standard 32 amp mode, the system came on in 11 amps mode. A recently (11/27) installed electronic interference filter (FPP) felt hot to Yuri's touch, who, on ground advice, turned off the Elektron, removed the filter and reconnected the cables. The electrolysis machine was successfully reactivated in 32 amp mode and was then operating nominally at 24 amps.]*

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

Yuri transferred the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Working from his discretionary "time permitting" task list, the FE-1 also performed the periodic collection & deletion of readings on the MOSFET (metal oxide semiconductor field-effect transistor) radiation sensor reader/display of the RBO-3-2 Matryoshka-R antroph-amorphous (human torso) "phantoms" located inside the station for sophisticated radiation studies, collecting radiation measurements every 15 minutes around the clock.
At ~7:05am, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

Weekly Science Update (Expedition Sixteen -- Week 16)

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Radiation measurements continue to be performed in the PIRS module..

ANITA: Completed.

BCAT-3 (Binary Colloidal Alloy Test 3): Dan Tani ran Sample 5 for BCAT-3 using a custom set up of his own design. "We got some really good data with this and we're seeing structure in Sample 5, which we didn't know was possible. Very nice. Thank you. The BCAT-3 samples have now been stowed and we are looking forward to getting the DVDs of the data. And thanks for the pictures of the BCAT-3 set up showing Dan working with it. This really helps us when we share with the world why we're excited about this work". BCAT-4 will be coming up on 1JA.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): "Dan, currently you are scheduled to repeat the last CCISS session the day after 1E's launch, on Feb 8,9,10. We look forward to seeing the CCISS data. Thanks for participating!"

CFE (Capillary Flow Experiment): Reserve.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): In progress.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): In progress.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Blood and urine samples of first session for Malenchenko are stored in MELFI.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): Peggy completed three runs starting the extra, extra science; runs 25, 26 and 27 for those keeping score at home. "While the runs may seem old hat as Peggy can almost perform them from the bike, they are providing new and useful data each time. The PI is anxious to receive the flight tapes to begin detailed analysis, and looking forward to the crew conference. InSPACE-2 remains grateful to Peggy for sharing her time with us".

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): "Thanks for operating LOCAD on Sunday, 2/3. Again, you chose some great sites and provided a quick general survey of endotoxin in the airlock. As expected, it was mostly free of endotoxin, apart from the hatch handle, which perhaps receives frequent handling. The results are a first step toward developing methods to monitor and restrict biological contamination associated with surface EVA during exploration missions. Thanks for all your hard work with LOCAD!"

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 "Pirs".

MULTIGEN-1: MULTIGEN-1 samples will be downloaded on STS-122 (1E).

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION/REPOSITORY: "Peggy, thanks for your continued attention to detail in completing the FD120 Nutr/Rep session. The information conveyed via crew notes proves to be very helpful for planning purposes. Only one session remains (FD180). Dan, thank you for your continued attention to detail in completing your FD120 Repository session. We appreciate your participation!".

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): "Peggy, you continue to be an excellent SLEEP subject and the PI appreciates all your extra logging. Dan, thanks for any SLEEP Logging."

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): In progress.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: In progress.

CEO (Crew Earth Observation): Ongoing.

No **CEO** photo targets uplinked for today.

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/08/08
Date:	Friday, February 08, 2008 5:57:18 PM
Attachments:	

ISS On-Orbit Status 02/08/08

All ISS systems continue to function nominally, except those noted previously or below. *Dan Tani's 109th day in space.*

The crew's work/sleep cycle was shifted once more in preparation for Atlantis 1E arrival, to **5:00am-8:15pm**.

STS-122/Atlantis continues its catch-up flight for tomorrow's FD3 ISS docking at ~12:25pm EDT, to begin ISS Stage 1E. (Catch-up rate ~480 nmi. per revolution of ~92 min.). *[Hatch opening: expected at ~1:35pm, followed by: Safety Briefing, OBSS (Orbiter Boom Sensor System) handoff from SSRMS (Space Station Remote Manipulator System) to SRMS (Shuttle RMS) at ~4:30pm, Soyuz seat liner transfer (for the Tani/Anderson exchange), and preparations for the first spacewalk, EVA-1, by EV1 Walheim & EV2 Schlegel, on 2/10, preceded by their overnight Campout tomorrow night in the Airlock (A/L) for denitrogenation/pre-breathe. Objectives of the nominal 11-day mission: Delivering & installing the Columbus module, delivering new ISS-16 crewmember Léopold Eyharts & bringing Dan Tani back home, and conducting a total of three EVAs. Landing will nominally take place at KSC on FD10 (2/18) at ~9:59am EST.]*

After wakeup and before breakfast, FE-2 Dan Tani completed his daily access of the SLEEP experiment (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop for downlink. *[To monitor the crewmember's sleep/wake patterns and light exposure, Dan wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

The FE-2 worked on recharging a total of 8 batteries for two DCS digital still

cameras in two batches of four simultaneously for the two DCS-760 digital cameras, to be used for the Orbiter RPM (R-bar Pitch Maneuver) photo shoot tomorrow. *[Rbar = along the radius vector of the ISS, downward. During the RPM at ~600 ft from the station, the ISS crew will have only ~90 seconds for taking high-resolution digital photographs, using the 400mm & 800mm telephoto lenses, of all tile areas and door seals on the Atlantis from SM windows 6 & 8, to be downlinked for launch debris assessment. Thus, time available for the shooting will be very limited, requiring great coordination between the two headset-equipped photographers and the Shuttle.]*

Also for the upcoming high-pressure RPM P/TV (Photo/Video) activity, Tani worked throughout the day on formatting the necessary P/TV storage devices. *[Formatted, in a Kodak DCS 760 camera on station power, were five 1GB EVA Flash Cards plus three PCMCIA 1GB Microdrives, each one taking ~20 minutes. Afterwards, the reformatted cards and microdrives were transferred to the SM (Service Module) for the DCS 760 camera configuration to get ready for the RPM documentation.]*

Working in the newly arrived 28P cargo ship (TKG), Yuri Malenchenko installed the LKT local temperature sensor commutator (TA251MB) of the BITS2-12 onboard telemetry measurement system, along with its ROM unit (read-only memory, TA765B), a 1-hr. job. The LKT was subsequently switched on by the ground to complete the basic configuration. Yuri then completed the electronic integration of 28P into the ISS by installing the standard US-21 matching unit, another 1-hr. task. Afterwards, the Progress thrusters were testfired to insure their functionality in providing attitude control for ISS. These tests were successful and 28P is now incorporated into the steering logic for the ISS. *[The US-21 matching unit connects the SM with the Progress motion control and DPO thrusters systems, so that they can be commanded by the SM computer system (BVS). After bolting the box down, Yuri hooked up its the telemetry (TM) connector to the BITS2-12 onboard TM system on Go from TsUP, after Moscow had inhibited data output to the VD-SU control system mode, powered off the BITS and deactivated the SKV-1 air conditioner. These systems were subsequently turned back on. The dynamic thruster test of the installation was successful.]*

FE-2 Tani completed his third (and last) on-orbit session with the CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS) experiment, with Peggy Whitson acting as operator, by setting up and donning the Holter Monitor, donning the CBPD (Continuous Blood Pressure Device), performing the Baro Study, doffing the CBPD, and starting the 24-hr passive heart rate data collection. Data are recorded on a PCMCIA memory card, with the HRF (Human Research Facility) rack laptop for control. Data download and equipment stowage is scheduled tomorrow after the 24-hr period. *[CCISS studies the effects of long-duration spaceflight on crewmembers' heart functions and their blood vessels that*

supply the brain (="cerebrovascular"). Learning more about the changes in cardiovascular & cerebrovascular systems in zero-G could lead to specific countermeasures that might better protect future space travelers. For the Baro study of CCIS, heart rate and blood pressure are being recorded for resting and timed breathing for 5 min, with no caffeine or food (water is acceptable) allowed two hours before the start of the Baro Study and no exercise prior to the Baro Study.]

Malenchenko had about 30 minutes set aside for maintenance/servicing of the toilet facility (ASU), changing out replaceable ASU parts with new components, e.g. a receptacle (MP) and a filter insert (F-V). All old parts were discarded as trash.

The FE-1 also prepared equipment for the upcoming installation of a new electronic interference filter in the Elektron O_2 generator system, designed to prevent RFI (radio-frequency interference) with the ATV/Automated Transfer Vehicle. *[On 12/21/07, when Yuri assisted the ground in activation the Elektron in the standard 32 amp mode, the system came on in 11 amps mode. A recently (11/27) installed electronic interference filter (FPP) felt hot to Yuri's touch, who, on ground advice, turned off the Elektron, removed the filter and reconnected the cables. The electrolysis machine was successfully reactivated in 32 amp mode and was then operating nominally at 24 amps.]*

FE-2 Tani set up the latest software version of the DOUG (Dynamic Onboard Ubiquitous Graphics) application, intended for the upcoming Columbus transfer and 10A spacewalks.. *[DOUG is a special application running on the MSS (Mobile Service System) RWS laptops that provides a graphical birdseye-view image of the external station configuration and the SSRMS arm, showing its real-time location and configuration on a laptop during its operation.]*

Also in support of 1E, CDR Peggy Whitson –

- Installed the ISS-side string of the BPSMU (Battery Powered Speaker Microphone Unit) *[after Shuttle docking, cables connected to the Shuttle-half of the dragthrough QD (quick disconnect) will be installed by the Shuttle crew],*
- Performed the pressurization process on the PMA-2 (Pressurized Mating Adapter #2), followed by leak checking and additional preparations of the PMA for the Shuttle's arrival *[the pressurization equipment was left connected for the post-docking leak checks]*,
- Powered on the Cupola RWS (Robotic Work Station) and Airlock (A/L) A31p laptops in preparation for their support of the 1E docked mission, and.
- Configured & connected the bypass cables of the VDS VTR (Video Distribution System/Video Tape Recorder) for passing video to and from the station on the Lab's starboard side and allowing the station to receive video

from the Orbiter on the Lab's port side.

FE-1 Malenchenko meanwhile powered down the VOA (Volatile Organics Analyzer).

The regular installation of the IWIS (Internal Wireless Instrumentation System) hardware for measuring and recording structural dynamics during docking was completed by Whitson.

In the Lab, the CDR connected the regular ITCS LTL (Internal Thermal Control System/Low Temperature Loop) coolant jumper at the LAB1D6 rack in support of ground-commanded activation of the U.S. CDRA (Carbon Dioxide Removal Assembly). *[A PPL (Pre-Positioned Load) was uplinked earlier today to mask a faulty temperature sensor ("A") that was causing the CDRA to deactivate earlier in the week. The CDRA was then reactivated and went into operate nominally.]*

Peggy also conducted the periodic coolant sample collection from the Node-2 ITCS (Internal Thermal Control System) MTL & LTL (Medium & Low Temperature Loops), as well as from the PhosRA (Phosphate Removal Assembly).

Regular surface sampling was conducted by Peggy for the SWAB (Characterization of Microorganisms & Allergens in Spacecraft) experiment.

Afterwards, Whitson performed the periodic offloading of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling CWC (Contingency Water Container) #1062 with the collected water slated for processing, and putting aside two water samples in bags (1 sample bag, 1 purge bag) for return to Earth. *[Estimated offload time before termination (leaving ~6 kg in the tank): ~40 min.]*

In Node 2, the FE-2 installed a J01 camcorder cap on the S3 viewport (camcorder port 1).

Tani finished disassembly and packing of the BCAT-3 (Binary Colloidal Alloy Test-3) science payload which had run by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 and EVA-14 photo support). *[The experiments was supported by Dan with periodic status checks, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) was taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour.]*

With the Elektron-VM O_2 (oxygen) generator currently off, a cabin air refresh was performed by the FE-1 from Progress 27P storage (SrPK) as required.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

Yuri then transferred the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Working off his discretionary "time permitting" task list, Yuri conducted the daily monitoring, picture-taking and downloading on the newly set up BIO-5 Rasteniya-2 ("Plants-2") experiment. *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. During the duration of the BI O-5 experiment, students of the Moscow City Palace for Youth Creativity of the Meshchansky inter-regional center #15 in Moscow) and the Prince of Oldenburg Lyceum in St. Petersburg will be cultivating plants in parallel on the ground and conducting comparative observation of plant growth and development under gravity and zero-gravity conditions. They are receiving the photo images taken by Yuri.]*

At ~7:05am, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~7:35am EST, Peggy Whitson and Dan Tani supported two PAO TV interviews of 6 minutes each, one with CBS News, the other with MSNBC News.

AT ~9:20am, Yuri Malenchenko supported an interview with a correspondent of Rossiysky Kosmos Magazine, Moscow. *["Could you summarize what you have been able to accomplish to date and what your plans are for the future?"; "What did the new cargo vehicle bring to the station?"; "What are the main objectives of the joint ISS/STS-122 flight?"]*

At ~2:05pm, the crew had their ninth weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC-10 (Station Support Computer 10)]*.

At ~7:00pm, Rex Walheim (EV1) and Hans Schlegel (EV2) will begin their

“campout” in the A/L with hatch closure and depressurization of the CL (Crewlock) from 14.7 to 10.2 psi, followed by mask prebreathe. Sleep time for the ISS crew begins at 8:15pm. *[For the Campout, fresh METOX (Metal Oxide) canisters are installed in the A/L for CO_2 control.]*

Significant Events Ahead *(all dates Eastern Standard, some changes possible.):*

- 02/09/08 – STS-122/Atlantis/1E docking (~12:25pm EST)
- 02/10 (FD 04) -- EVA-1 to install PDGF (Power & Data Grapple Fixture) on Columbus module, to unberth and install Columbus module on starboard side of Node-2, and to prepare the P1 Truss NTA (Nitrogen Tank Assembly) for repair and replacement;
- 02/11 (FD 05) -- Focused Inspection (if required); prepare for and perform Columbus module ingress;
- 02/12 (FD 06) -- Perform Columbus module outfitting; EVA-2 to remove failed NTA from P1 truss and to install a new NTA;
- 02/13 (FD 07) -- Continue Columbus module outfitting; crew off-duty period;
- 02/14 (FD 08) -- EVA-3 to transfer the SOLAR (Solar Monitoring Observatory) and the EuTEF (European Technology Exposure Facility) to the Columbus module external payload facility, and to retrieve a failed CMG (Control Moment Gyro) and stow for return;
- 02/15 (FD 09) -- Cargo transfers; close hatches in preparation for undocking;
- 02/16 (FD 10) -- Undock from ISS; perform final OBSS berthing;
- 02/17 (FD 11) -- Stow cabin; checkout Shuttle flight control systems;
- 02/18 (FD 12) -- Prepare for and perform deorbit burn; land at KSC (Nominal Landing) ~9:59am EST.

03/07/08 -- ATV-1 “Jules Verne” launch/Ariane V (Kourou, French Guyana); docking early April
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)

09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/06/08 -- STS-119/Discovery/15A launch – S6 truss segment
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04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/07/08
Date:	Friday, February 08, 2008 2:20:57 AM
Attachments:	

ISS On-Orbit Status 02/07/08

All ISS systems continue to function nominally, except those noted previously or below.

The crew's work/sleep cycle was shifted preparatory to Atlantis 1E arrival to **3:30am-8:30pm**.

Yest kasaniye! Progress M-63 (28P), approaching from below the station, docked flawlessly at the DC1 Docking Compartment nadir port at 9:38am EST, followed by docking probe retraction and hook closure ("sborka") after motion damp-out, while the ISS was in LVLH (local vertical/local horizontal) attitude. All Progress systems operated nominally from Automated Rendezvous start. *[Launched on 2/5 (8:02am EST), the 28P resupply drone delivered about 2.5 tons of cargo for the ISS crews, including propellants for the Russian thrusters, fresh water, oxygen, food, spare parts, repair gear, life support and science experiment hardware.]*

STS-122/Atlantis lifted off flawlessly right on time at 2:45pm EST on Mission ISS-1E with all systems performing nominally. The Orbiter will dock to the ISS on 2/9 (Saturday) at approximately 12:24pm EST and is currently catching up with the ISS, carrying the seven-member crew of Commander Stephen Frick, Pilot Alan Poindexter and Mission Specialists Hans Schlegel, Leland Melvin, Léopold Eyharts, Stanley Love and Rex Walheim. STS-120 is the 121st space shuttle flight, the 29th flight for the Atlantis, and the 24th flight to the station. Its primary payload is the European Columbus module. **We are off to another great mission!**

After wakeup and before breakfast, FE-2 Dan Tani completed his daily access of the SLEEP experiment (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop for downlink. *[To monitor the crewmember's sleep/wake patterns and light exposure, Dan wears a special Actiwatch device which measures the light levels encountered by him as well as his*

patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]

Also upon wake-up, CDR Whitson started Part 2 (of 5) of the periodic acoustic measurement protocol by recording post-sleep data of the crew-worn acoustic dosimeters, later deploying the dosimeters statically in the Service Module (SM) (Panel 404 near SM air conditioner, SM Central Post, & Vozdukh) for the duration of the day. *[Acoustic data must be taken twice per Increment, each time for the duration of the 16-hour crew workday.]*

At ~5:55am, the FE-2 again activated the VDS MPC (Video Distribution System/ Multi-Purpose Converter) with its four downlinks to allow the ground to conduct HDTV (high-definition TV) playback and downlink operations. Later (~2:10pm), the MPC was powered off again. *[The end-to-end test of the system, conducted by the crew and ground specialists on 1/17 to verify the MPC HDTV (Multi-Purpose Converter/High-Definition TV) capability all the way to the NASA TV satellite, was very successful, yielding an overall end-to-end audio latency (delay) for the MPC System of 3.2 seconds. This is the delay from the crewmember to JSC/MCC-H to NASA Headquarters and out to the NASA TV satellite in high definition (including, but are not limited to, CNNHD, ABC, NBC, CBS, and Discovery HD Theater), i.e. the sum total of the audio delay the interviewer and interviewee will "feel" during an interactive event. This Japan/JAXA originated system will be utilized soon for downlink messages and in-flight interviews based on client capability.]*

The crew monitored the 28P docking and recorded it with the HD (High Definition) video camera and then downlinked the video to the ground for viewing.

Earlier today, FE-1 Malenchenko and CDR Whitson had completed final preparations for Progress arrival, including turning off amateur (ham) radio equipment in the ISS to prevent any interference with Progress/KURS radio traffic, and activation of the SSC6 (Station Support Computer 6) A31p laptop in the FGB for handling the video transmission from the Russian segment (RS) via the Ku-band assets in the USOS. *[The A31p used for the routing from the SM is located in the FGB since available cables are not long enough to extend to the Node. The video signal is fed from there via coaxial cable to the SSC Operations LAN (local area network) and from there into the Ku-band system for subsequent conversion from the Russian SECAM format to the American NTSC format on the ground. The newly set up VSW (Video Streaming Workstation) failed to convert and/or downlink analog video of the docking to MCC-Houston and thence to TsUP-Moscow. A second video stream, a digital MPEG (Moving Pictures Expert Group 2) transmission originating in the RS by the Russian/ESA encoder, passed without problem via the ISS JSL (Joint Station LAN) through Ku-band to both MCCs.]*

Malenchenko and Whitson then monitored the docking process from the TORU (teleoperated approach & docking system) station in the SM, in “hot standby” mode, and took photography of the Progress approach and linkup. *[Yesterday, it was reported here that one of the two VHF receivers of the TORU system has failed aboard the Service Module (SM). This was in error since the failed VHF receiver is on the Progress, not on the SM.]*

After the docking, the crew shut off TORU and began reconfiguring the STTS telephone/telegraph subsystem to normal ops. *[The "Voskhod-M" STTS enables telephone communications between the SM, FGB, DC1 and U.S. segment (USOS), and also with users on the ground over VHF channels selected by an operator at an SM comm panel, via STTS antennas on the SM’s outside. There are six comm panels in the SM with pushbuttons for accessing any of three audio channels, plus an intercom channel. Other modes of the STTS include telegraphy (teletype), EVA voice, emergency alarms, Packet/Email, and TORU docking support.]*

The FE-1 then conducted the standard one-hour leak checks of the docking vestibule and fuel/oxidizer transfer line interface between Progress and DC1. During leak checking and initial clamp installation, Russian thrusters were inhibited (as they were during docking).

The new Progress provided the ISS cabin with a 12.2 mmHg air repress. This repress sets the initial ISS pressure profile for the 1E mission.

After opening the two hatches, Yuri and Peggy first installed the QD (quick disconnect) screw clamps (BZV) of the docking & internal transfer mechanism (SSVP) to rigidize the coupling, and the FE-1 removed the PkhO/DC1 (SU) hatch cover, reinstalled the IP-1 airflow sensor and assembled the ventilation/heating air duct. The crew obtained a photo of a mark left on the passive mechanism receiving cone by the active docking mechanism probe and downlinked the data.

Next, Malenchenko performed the standard air sampling inside the Progress with the Russian AK-1M air sampler, then deactivated the cargo ship.

Peggy and Yuri then began Progress unloading and cargo transfer to the ISS, accompanied by IMS (Inventory Management System) logging.

Tani performed his daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 and EVA-14 photo support). Later, Dan was instructed by POC (Payload Operations Center) to disassemble and stow the BCAT-3 payload. *[The status check, conducted on the last image taken by the DCS 760 digital still camera which*

is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour.]

On the RED resistive exerciser, Dan Tani completed the periodic cable replacement with spare cables that arrived today on 28P. The replacement was followed by a calibration procedure that is required to allow the ASCRs (Astronaut Strength, Conditioning, & Rehabilitation Specialists) to update crew exercise protocols as necessary and track RED hardware status.

In the FGB, Malenchenko replaced the OSP-4 fire extinguisher with a new spare.

The CDR conducted the weekly 10-min. CWC audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week (currently #16-0018Q).]*

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED resistive exercise device (CDR), and VELO bike with bungee cord load trainer (FE-1).

Whitson then transferred the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/06/08
Date:	Thursday, February 07, 2008 12:20:39 AM
Attachments:	

ISS On-Orbit Status 02/06/08

All ISS systems continue to function nominally, except those noted previously or below.

Progress M-63/28P is continuing its 3-day flight to the ISS for docking tomorrow morning (2/7) at ~9:38am EST at the DC1 nadir port.

After wakeup and before breakfast, FE-2 Dan Tani completed his daily access of the SLEEP experiment (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop for downlink. *[To monitor the crewmember's sleep/wake patterns and light exposure, Dan wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Before breakfast, CDR Whitson began Part 1 (of 5) of the periodic acoustic measurement protocol by deploying crew-worn acoustic dosimeters, to be carried for 24 hours (with a microphone on the shirt collar). (Last time done: 12/26). *[Tonight, after about 15 hours of measurements, dosimeter data will be downloaded and the hardware power-cycled for another data take starting tonight after 8.5-hr. sleep. At that point, the crew will deploy the dosimeters statically in the station for the duration of the day, record measurements tomorrow noon and stow the instruments. Acoustic data must be taken twice per Increment, each time for the duration of the 16-hour crew workday.]*

Before breakfast and exercise, FE-1 Malenchenko completed his second session with the periodic Russian MedOps test "Hematokrit" (MO-10), measuring red cell count of the blood. *[The blood samples were drawn from a finger with a perforator lancet, then centrifuged in two microcapillary tubes in the M-1100 kit's minicentrifuge, and its hematocrit value was read off the tubes with a magnifying*

glass. It is a well-known phenomenon of space flight that red blood cell count (normal range: 30-45%) tends to go down over time. After the exam, the data were saved in the IFEP software (In-Flight Examination Program) on the MEC (Medical Equipment Computer), and Oleg Kotov stowed the equipment.]

Also upon wakeup, Malenchenko terminated his ninth MBI-12 SONOKARD experiment session, started last night, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

All three crewmembers participated in the periodic training exercise for emergency response to fire on-board the ISS. Today the emergency simulation was a burning odor in Node-1. A conference between the crew and ground specialists was held after the simulation to assess the training exercise.

CDR Whitson and FE-1 Yuri Malenchenko conducted a TV downlink test via Ku-band. The purpose of this test was to convert the Russian video signal into an NTSC (National Television Standards Committee) video signal for downlink via Ku-Band, as well as MPEG-2 (Motion Picture Expert Group 2) streaming video via OpsLAN (Operations Local Area Network). This procedure can be used during Soyuz, Progress, and Automated Transfer Vehicle (ATV) dockings or Russian-based Extravehicular Activities (EVAs). The test was nominal.

Whitson and FE-2 Dan Tani worked in the U.S. Airlock (A/L), successfully completing numerous EVA hardware configuration activities. *[Peggy and Dan reconfigured EMU 3018 for use by Stan Love during Flight 1E and configured EMUs 3006 and 3008 for Flight 1J/A. Tani also gathered US EVA tools, reprogrammed PGTs (Pistol Grip Tools), and checked out two SAFER (Simplified Aid for EVA Rescue) units. These activities were all in support of Flight 1E. In addition to EMU resizing, the CDR initiated an EMU battery discharge cycle to completely discharge EMU battery 2041. Completely discharging this battery will maximize its effectiveness in supporting EVAs during Flight 1J/A.]*

Using the vacuum cleaner and other tools, the FE-2 performed the periodic 80-min US segment (USOS) hatch seal inspection (Node-1 forward, aft & starboard, Lab aft & forward, Node-2 aft, and Joint Airlock) in support of ACS (Atmospheric Control

System) maintenance (last time done: 11/17).

Continuing his support of the NUTRITION experiment, Dan Tani collected urine samples for the Repository payload. *[Repository utilizes a storage bank to maintain biological specimens over extended periods of time and under well-controlled conditions. Samples from ISS crewmembers, which include blood and urine, are collected, processed, and archived during the preflight, inflight, and postflight phases of ISS missions. These biosamples will serve as a resource for future spaceflight-related medical research.]*

CDR Whitson completed T+2 in-flight microbiology analysis of water samples she collected in MCDs (Microbial Capture Devices) on 2/4. *[The water samples were taken from the SM SRV-K (Service Module/Condensate Water Processor) Hot and Warm water taps. Some of the samples taken on 2/4 will return on Flight 1E for ground analysis.]*

Last night, when TsUP-Moscow performed a TORU system test on the SM, it failed, showing zero output voltage on the primary VHF receiver. During the next ground pass (Daily Orbit 4), when the output voltage was still 0 on the primary VHF receiver, Moscow switched to the backup VHF receiver, on which it was nominal. The TORU system test was nominal on the backup VHF receiver. *[TORU is still available for docking, but now zero-fault tolerant. Per Flight Rules D2-8 para. D, D2-10 para. B.2 docking is still possible since the Kurs system is available. Since TORU is a backup to KURS and is only used if the crew needs to perform manual docking, Progress 28P is still GO for docking tomorrow morning at ~9:38am EST.]*.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

Whitson then transferred the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

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03/06/08 -- ATV-1 Demo Day 1

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04/08/08 -- Soyuz TMA-12/16S launch
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/05/08
Date:	Tuesday, February 05, 2008 11:50:28 PM
Attachments:	

ISS On-Orbit Status 02/05/08

All ISS systems continue to function nominally, except those noted previously or below.

With the usual dependability, **Progress M-63/28P launched nominally this morning at Baikonur** at 8:02am EST. Ascent was nominal, all appendages (antennae and solar arrays) deployed nominally and the vehicle reached orbital insertion at 8:12am. 28P is scheduled to dock to the ISS on 2/7 (Thursday) at 9:38am. *Congrats, Baikonur!*

After wakeup and before breakfast, FE-2 Dan Tani completed his daily access of the SLEEP experiment (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) software for data logging and filling in questionnaire entries in the experiment's laptop session file on the HRF-1 laptop for downlink. *[To monitor the crewmember's sleep/wake patterns and light exposure, Dan wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Before breakfast & first exercise, Whitson, Malenchenko and Tani completed a full session with the Russian crew health monitoring program's medical assessment MO-9/Biochemical Urinalysis. Afterwards, the FE-1 closed out and stowed the Urolux hardware. *[MO-9 is conducted every 30 days (and also before and after EVAs) and is one of five nominal Russian medical tests adopted by NASA for U.S. crewmembers for IMG PHS (Integrated Medical Group/Periodic Health Status) evaluation as part of the "PHS/Without Blood Labs" exam. The analysis uses the sophisticated in-vitro diagnostic apparatus Urolux developed originally for the Mir program. Afterwards, the data are entered in the MEC (Medical Equipment Computer)'s special IFEP software (In-Flight Examination Program).]*

The FE-1 serviced the Russian BMP (Harmful Impurities Removal System), starting

the "bake-out" cycle to vacuum on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process was terminated at ~2:15pm EST. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. Filter bed 1 was regenerated yesterday.]*

Having passed the "Day 120" mark in his flight, FE-2 Tani began his first session with the NASA/JSC experiment NUTRITION w/Repository, for which he had to forego exercising and food intake for eight hours. Today's protocol consisted of two blood draws (for Serum & Heparin). Later, the FE-2 set up the equipment for the 24-hour urine collections which start with the first void early tomorrow morning and continue through Thursday morning. *[Acting as operator, Peggy Whitson as CDR performed phlebotomy on Dan Tani, i.e., drawing blood samples (from an arm vein) which was first allowed to coagulate in the Repository, then spun in the HRF RC (Human Research Facility/Refrigerated Centrifuge) and finally placed in MELFI (Minus-Eighty Laboratory Freezer for ISS). The RC was later powered off after a temperature reset to limit wear on the compressor, and cleaned. Background: NUTRITION is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight; this includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes. The Clinical Nutritional Assessment profile currently required on all U.S. Astronauts collects blood and urine samples preflight and postflight. NUTRITION expands this protocol by also capturing inflight samples and an additional postflight sample. Furthermore, additional measurements are included for samples from all sessions, including additional markers of bone metabolism, vitamin status, and hormone and oxidative stressor tests. The results will be used to better understand the impact of countermeasures (exercise and pharmaceuticals) on nutritional status and nutrient requirements. The Clinical Nutritional Assessment profile (MR016L), first started on two Mir crewmembers and then on all ISS US crews, nominally consists of two pre-flight and one post-flight analysis of nutritional status, as well as an in-flight assessment of dietary intake using the FFQ (Food Frequency Questionnaire). The current NUTRITION project expands MR016L testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

The crewmembers participated in an emergency descent OBT (onboard training) exercise. The training includes review of procedures, crew responsibilities, Soyuz activation, hatch closure, leak checks, suit donning, undocking preparation, orbital descent module leak checks, descent timeline simulation and landing operations.

At ~9:10am, Peggy and Yuri had a 15-min teleconference with ground specialists to discuss the images downlinked from their recent (1/31) Shuttle RPM (R-bar Pitch

Maneuver) skill training. *[The skill training prepares the crew for the bottom side mapping of the Orbiter at the arrival of STS-122/1E. During the RPM at ~600 ft from the station, the ISS crew will have only ~90 seconds for taking high-resolution digital photographs of all tile areas and door seals on the Orbiter, to be downlinked for launch debris assessment. Thus, time available for the shooting will be very limited, requiring great coordination between the two headset-equipped photographers and the Shuttle.]*

Tani performed his daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 & EVA-14 photo support). *[The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour.]*

The FE-1 conducted the periodic (monthly) functional closure test of the Russian Vozdukh CO_2 removal system's spare emergency vacuum valves (AVK), in the spare parts kit. *[The AVKs are critical because they close the Vozdukh's vacuum access lines in the event of a malfunction in the regular vacuum valves (BVK) or a depressurization in the Vozdukh valve panel (BOA). Access to vacuum is required to vent* CO_2 *during the regeneration of the absorbent cartridges (PP). During nominal operation, the AVK valves remain open.]*

In preparation for payloads coming up on Progress 28P, Yuri Malenchenko assembled and set up the Russian TBU (Universal Biotechnological Thermostat) cooler in the Service Module (SM).

Later, the FE-1 unstowed and installed the equipment for the periodic Russian PZE-MO-10 "Hematokrit" testing that is scheduled tomorrow for him. *[MO-10 measures the hematocrit (red blood cell mass) value of the blood (it is a well-known phenomenon of space flight that red blood cell mass {normal range: 30-45%} tends to go down over time).]*

The FE-1 completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Working off his discretionary "time permitting" task list, the FE-1 also performed the daily 20-min. IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow,

Baikonur).

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

Whitson then transferred the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/04/08
Date:	Monday, February 04, 2008 10:36:34 PM
Attachments:	

ISS On-Orbit Status 02/04/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 16 of Increment 16.*
This morning, Progress M-62/27P successfully undocked from the ISS DC1 at 5:32am EST 26P will remain in orbit in free flight until 2/15, continuing to phase out in front of the ISS (about 40 km per orbit) in order to support Russian Earth observation experiments. *[The separation appeared smooth, with no anomalous behavior reported by the crew. TsUP-Moscow confirmed a 15 second first separation burn complete at approximately 5:35:07anm EST. The ISS returned to US Momentum Management (MM) at approximately 6:46am EST.]*
FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the sessions file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

FE-1 Malenchenko performed the periodic service of the Russian BMP (Harmful Impurities Removal System) by starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The regen process will be terminated before sleeptime, at ~3:05pm EST. Regeneration of bed #2 follows tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods.]*

At ~3:20am, the FE-2 again activated the VDS MPC (Video Distribution System/ Multi-Purpose Converter) with its four downlinks to allow the ground to conduct HDTV (high-definition TV) playback and downlink operations. Later (~2:10pm), the MPC was powered off again. *[The end-to-end test of the system, conducted by the crew and ground specialists on 1/17 to verify the MPC HDTV (Multi-Purpose Converter/High-Definition TV) capability all the way to the NASA TV satellite, was*

very successful, yielding an overall end-to-end audio latency (delay) for the MPC System of 3.2 seconds. This is the delay from the crewmember to JSC/MCC-H to NASA Headquarters and out to the NASA TV satellite in high definition (including, but are not limited to, CNNHD, ABC, NBC, CBS, and Discovery HD Theater), i.e. the sum total of the audio delay the interviewer and interviewee will "feel" during an interactive event. This Japan/JAXA originated system will be utilized soon for downlink messages and in-flight interviews based on client capability.]

FE-1 Malenchenko set up the "Chibis" garment , an extensive cardiovascular test of human pericardium (heart muscle) activity as well as of primary parameters of central and regional blood circulation at rest and under the effect of lower body negative pressure (LBNP, Russian: ODNT). Yuri and Peggy Whitson then conducted MBI-5 LBNP sessions. *[The LBNP applies a lower than ambient pressure to the body from the hips down to simulate 1g loads normally experienced on Earth. This acts as an orthostatic stressor and can be used to study deconditioning of the human cardiovascular system in space. The Chibis provides gravity-simulating stress to the body's cardiovascular/circulatory system for evaluation of Yuri's & Peggy's orthostatic tolerance (e.g., the Gauer-Henry reflex) after 7 weeks in zero-G. The MBI-5 protocol again consisted of first imbibing 150-200 milliliters of water or juice, followed by a sequence of progressive regimes of reduced ("negative") pressure, set at -25, -30, -35 and -40 mmHg for five minutes each, while shifting from foot to foot at 10-12 steps per minute. The body's circulatory system interprets the pressure differential between upper and lower body as a gravity-like force pulling the blood and body fluids "down". MBI-5 data output include blood pressure readings with the Tenzoplus Sphygmomanometer, today without telemetry data monitoring but reporting of heart rate and blood pressure to TsUP-Moscow.]*

The CDR readied the PZE MO-9 equipment for another Russian "Urolux" biochemical urine testing, scheduled tomorrow for all three crewmembers. *[MO-9 is conducted regularly every 30 days (and also before and after EVAs) and is one of five nominal Russian medical tests adopted by NASA for US crewmembers for IMG (Integrated Medical Group) PHS evaluation as part of the "PFE w/o Blood Labs" exam. The analysis uses the sophisticated in-vitro diagnostic apparatus Urolux developed originally for the Mir program. The data are then entered in the Medical Equipment Computer (MEC)'s special IFEP (In-Flight Examination Program) software.]*

After the 27P undocking, FE-1 Yuri Malenchenko manually closed the PEV (Pressure Equalization Valve; Russian: KVD) between the DC1 and its docking port vestibule.

FE-1 Yuri Malenchenko successfully replaced the Russian Navigation Computer

Module (NVM-1). *[During recent ASN-M testing, the NVM-2 experienced erratic behavior when commanded as the prime controller and switching unexpectedly to the backup controller NVM-2. The NVM is the hardware responsible for receiving state vector signals, processing raw measurements, and providing position, velocity, and time information. ESA (European Space Agency), NASA, and RSC-E (Rocket Space Corporation - Energia (RSC-E) jointly agreed that three healthy NVM-1 (one onboard spare) are required for ATV1 rendezvous. ATV1 is no go for docking until NVM-2 is replaced and confirmed as operational. The new unit was activated and will be monitored by ground specialists for approximately 48 hours. A new NVM will also be delivered on 28P.]*

After Peggy Whitson prepared the auditory test equipment, she, Malenchenko & FE-2 Tani took the periodic (monthly) O-OHA (On-Orbit Hearing Assessment) test, a 30-min. NASA environmental health systems examination to assess the efficacy of acoustic countermeasures, using a special MEC (Medical Equipment Computer) laptop application. It was the third session for the three crewmembers. *[The O-OHA audiography test involves minimum audibility measurements for each ear over a wide range of frequencies (0.25-10 kHz) and sound pressure levels, with the crewmembers using individual-specific Prophonics earphones, Bose ANC headsets and the SLM (sound level meter). To conduct the testing, the experimenter is supported by special EarQ software on the MEC, featuring an up/down-arrow-operated slider for each test frequency that the crewmember moves to the lowest sound pressure level at which the tone can still be heard. The baseline test is required not later than about Flight Day 14 for each new Expedition and is then generally performed once per month. Note: There have been temporary hearing deficits documented on some U.S. and Russian crewmembers, all of which recovered to pre-mission levels.]*

CDR Whitson obtained sound level measurements in specific locations throughout ISS. The measurements included: 13 locations in the US Lab including inside the Temporary Sleep Station (TeSS), 6 locations in Node 2, and three in the SM Kayuta sleep stations. The crew also noted any non-nominal hardware or configuration that was excessive causing noise. The data will be downlinked for analysis.
Tani and Whitson changed the 4AA batteries in the SB-28 flash. *[Then, they homogenized and manually photographed BCAT-3 samples 1-6 with 5 being the last sample to homogenize then photograph--this will then have the setup ready for the next activity which is a long-term sample 5 run.]*
The FE-1 completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables plus the weekly collection of the toilet flush counter (SPK-U) and water supply (SVO) readings for calldown to TsUP/Moscow.
The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS

cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/03/08
Date:	Monday, February 04, 2008 5:59:42 AM
Attachments:	

ISS On-Orbit Status 02/03/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday -- off-duty day for CDR Whitson, FE-1 Malenchenko and FE-2 Tani except for housekeeping and voluntary work. Ahead: Week 16 of Increment 16.*

FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Upon wakeup, CDR Whitson performed another urine collection for the NASA/JSC experiment NUTRITION w/Repository, collecting a final urine sample for storage in the MELFI (Minus-Eighty Laboratory Freezer for ISS), after which the experiment was turned off. The next urine collection closed out with the first void of today. Peggy's next Nutrition/ Repository activity is the FD180 session. *[The current NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

For today's VolSci (Voluntary Weekend Science) program, CDR Whitson continued her work with the MSG (Microgravity Science Glovebox) and the InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) experiment,

FE-2 Dan Tani's VolSci program for today consisted of another session (the fourth) of the LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System)/Phase 2 operations, sampling four of the sites that were identified in the CHeCS SSK (Crew Health Care Systems/Surface Sampler Kit) procedure also scheduled for today. *[The goal is to*

compare LOCAD results with the SSK colony growth results. LOCAD uses small, thumb-sized "microfluidic" cartridges that are read by the experiment reader. The cartridges contain dried extract of horseshoe crab blood cells and colorless dye. In the presence of the bacteria, the dried extract reacts strongly to turn the dye a green color. Therefore, the more green dye, the more microorganisms there are in the original sample. The handheld device tests this new analysis technology by sampling for the presence of gram negative bacteria in the sample in about 15 minutes, showing the results on a display screen.
Background: Lab-on-a-Chip technology has an ever-expanding range of applications in the biotech industry. Chips are available (or in development) which can also detect yeast, mold, and gram positive bacteria, identify environmental contaminants, and perform quick health diagnostics in medical clinics. The technology has been used to swab the MERs (Mars Exploration Rovers) for planetary protection. With expanded testing on ISS, began by Sunita Williams in March/April this year, this compact technology has broad potential applications in space exploration--from monitoring environmental conditions to monitoring crew health. The current study should prepare for long-duration exploration by demonstrating a system that enables the crew to perform biochemical analysis in space without having to return samples to Earth.]

After Houston Flight Controllers started deactivating the CDRA (Carbon Dioxide Removal Assembly) early this morning and cooling was no longer required, the FE-2 disconnected the ITCS LTL QD (Internal Thermal Control System/Low Temperature Loop/Quick Disconnect) jumper to the CDRA rack (LAB1D6).

The FE-1 completed the routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/ replaceables plus the weekly collection of the toilet flush counter (SPK-U) and water supply (SVO) readings for calldown to TsUP/Moscow.

Malenchenko also gathered weekly data on total operating time & "On" durations of the Russian POTOK-150MK (150 micron) air filter unit of the SM's SOGS air revitalization subsystem for reporting to TsUP.

Whitson and Tani had their weekly PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-9 laptop), Peggy at ~10:00am EST, Dan at ~11:25am.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

Working off his "time permitting" discretionary task list, Yuri conducted his sixth run of the Russian DZZ-2 "Diatomeya" ocean observations program, using the NIKON-F5 still camera with 80-200 mm Nikkor zoom lens and the SONY PD-150O camcorder to record color contrasts on water surface and irregular cloud cover pattern in the World Ocean target areas. *[Uplinked target zones in the Atlantic Ocean were offshore areas of*

Argentina, the Gulf of Guinea and the coastal area of Northwest Africa, the Amazon river runoff area and the Madeira Islands water region.]

Also from his discretionary "time permitting" task list, Malenchenko used the updated Symantec AntiVirus program to run a check on the RSS2 laptop and download data logs.

On Dan Tani's "job jar" task list for today was to fill out an uplinked questionnaire on the post-EVA condition of the EMU overgloves.

No **CEO** photo targets uplinked for today.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

Significant Events Ahead *(all dates Eastern Standard, some changes possible.):*
02/04/08 -- Progress M-62/27P undocking (5:32am; stays in orbit till 2/15)
02/05/08 -- Progress M-63/28P launch (8:02am)
02/07/08 -- Progress M-63/28P docking (9:38am)
02/07/08 -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite. ~2:40pm EST
02/09/08 -- Progress M-
02/22/08 -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana)
03/06/08 -- ATV-1 Demo Day 1
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/12/08 -- ATV-1 Demo Day 2
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC

09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/06/08 -- STS-119/Discovery/15A launch – S6 truss segment
11/08/08 -- STS-119/Discovery/15A docking
11/17/08 -- STS-119/Discovery/15A undocking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/02/08
Date:	Sunday, February 03, 2008 8:51:56 AM
Attachments:	

ISS On-Orbit Status 02/02/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday -- off-duty day for CDR Whitson, FE-1 Malenchenko and FE-2 Tani except for housekeeping and voluntary work.* ***>>>Yesterday, NASA observed the annual Day of Remembrance honoring those members of the NASA Family who lost their lives while furthering the cause of exploration and discovery. This memorial event honors the families and crews of Columbia STS-107, Challenger STS 51-L, and Apollo 1, as well as all the astronauts who have sacrificed their lives for this nation. <<<***

FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Upon wakeup, CDR Whitson performed the last sampling of her Day 120 session with the NASA/JSC experiment NUTRITION w/Repository, collecting a final urine sample for storage in the MELFI (Minus-Eighty Laboratory Freezer for ISS). The sampling kit was then stowed away. *[The current NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the Service Module (SM) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the CDR's sleep station with a standard cleaning solution; also, fan screens and grilles are*

cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]

Yuri and Peggy completed preparations for Progress M-62/27P undocking on Monday, 2/4 (5:27am) on its own free-flyer mission (till 2/15). *[The FE-1 and CDR finished trash loading and reported completion to the ground for the final Go from TsUP/Moscow, followed by cargo ship activation, tearing down the ventilation air duct, removing the threaded BZV QD (quick disconnect) screw clamps screw clamps of the SSVP docking & internal transfer system, and closing hatches between 27P and the transfer tunnel (PrK) to the DC1 after taking video of the mating surfaces/seals. They then conducted the one-hour vestibule leak check and downlinked the video imagery of the SM/Progress hatch interface. Russian MCS/thrusters were temporarily inhibited during the clamp removal due to loads constraints.]*

In the Airlock (A/L), Dan Tani terminated charging on the EMU (Extravehicular Mobility Unit) batteries in the BCA (Battery Charger Assembly) and the regeneration of the METOX (Metal Oxide) CO2 absorption canisters used during the EVA-14.

Yuri completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/ replaceables.

At ~8:40am EST, the crew held its regular weekly planning conference (WPC) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP/ Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

Dan then transferred the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Working off his discretionary "time permitting" task list, Malenchenko used the updated Symantec AntiVirus program to run a check on the RSS2 laptop and download data logs.

A second job item on the FE-1's voluntary list for today was another KPT-3 session to make observations and take aerial KPT-3 photography of environmental conditions for Russia's Environmental Safety Agency (ECON) using the Nikon D2X digital camera with SIGMA 300-800mm telephoto lens.

Weekly Science Update (Expedition Sixteen -- Week 15)

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Last memory card replacement activity has been successfully performed on 1/28. Radiation measurements continue to be performed in the PIRS module..

ANITA: Completed.

BCAT-3 (Binary Colloidal Alloy Test 3): All the photos that have been taken (up through Tuesday) since astronaut Dan Tani adjusted the camera for BCAT (last weekend) have looked great. The charger for the camera was removed on 1/ 29 to be used for an EVA (which put BCAT photography on hold) and the charger was returned on 1/ 31; it is anticipated that the camera for BCAT-3 will be reinitialized and started next Monday, 2/4.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): Dan, currently you are scheduled to repeat the last CCISS session on 2/4 and 2/5. This session is a repeat due to the Shuttle launch slip moving your last session out of the PI requirements."

CFE (Capillary Flow Experiment): Reserve.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): In progress.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): In progress.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): First session of the experiment for ISS FE-1 Yuri Malenchenko has been successfully completed from 1/24 to 1/26. Pictures of the blood smear plates have been downlinked and positively assessed by science team. Blood and urine samples have been stored in MELFI.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): "Thanks for operating LOCAD on 1/26. You achieved the main goal for that session: a positive spike EU/ml value for the negative control. This was valuable data, as it provides a more definitive indication that the swabbing kits on orbit have remained sterile and free of endotoxin. Your feedback and perseverance through the air bubbles/dispensing issues were especially appreciated, and I fully agreed with your evaluation. It is readily apparent that water is evaporating from the water cartridges over time (due to an incomplete seal), which makes the starting volume uncertain. Bubbles introduced during mixing are further interfering with accurate dispensing. We are working to fix these issues in the short term by flying up new swabbing kits on 1J/A; and in the long term by redesigning the water cartridge with a more complete seal, and redesigning the swab/dispensing tip to reduce bubble formation during mixing. We hope these changes will lead to greater certainty as regards starting/dispensing volumes and more accurate, quantitative analysis."

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 "Pirs".

MULTIGEN-1: MULTIGEN-1 samples will be downloaded on STS-122 (1E).

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION/REPOSITORY: In progress.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): "Peggy, thanks for any continued logging in the Sleep Log software! Dan, our only remaining activities are Sleep logging and doffing your Actiwatch on the Shuttle with the other 1E crewmembers. We are working to add the Sleep logging to the timeline for your convenience."

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): In progress.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: In progress.

CEO (Crew Earth Observation): Through 1/31 the ground has received a total of 12,994 frames of ISS/CEO imagery for review and cataloging. "We are evaluating your recent images of our requested target cities of Canberra and Sydney, Australia. We also believe that you have just acquired our first images in years of two islands in the northern part of the South Sandwich Islands archipelago (another target request). We've received confirmation of your acquisition of imagery of mega iceberg A53a from Glaciologist and Lead Scientist, Tom Scambos, at NOAA's National Snow and Ice Data Center. The iceberg is nearing the south side of South Georgia Island now and he says: "This is an iceberg worth watching, because, being water-saturated, it may well show a sudden, crumbling, disintegration, spreading fine blue micro-icebergs over the ocean surface." Thanks for your diligence and vigilance in locating and photographing these features under difficult viewing conditions. This weekend an excellent example of your Luquillo Mountains, Puerto Rico, a Long Term Ecological Research Site, will be posted on NASA/ GSFC's Earth Observatory website."

CEO photo targets uplinked for today was the **Kerguelen Islands Icecap, S Indian Ocean** *(at 50S, these islands support a permanent icefield which is of great interest as "one of the most sensitive icecap glaciers on earth." SRTM (Shuttle Radar Topography Mission data) data created a benchmark measurement of ice volume of the major Kerguelen icecap. Your remotely sensed images show ice margin change (which has a known relationship to ice volume change). Look right (Fig. 1) on the west end of the main island.*

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

Significant Events Ahead *(all dates Eastern Standard, some changes possible.):*
02/04/08 -- Progress M-62/27P undocking (5:27am; stays in orbit till 2/15)
02/05/08 -- Progress M-63/28P launch (8:03am)
02/07/08 -- Progress M-63/28P docking (9:33am)
02/07/08 -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite. ~2:40pm EST
02/09/08 -- Progress M-
02/22/08 -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana)
03/06/08 -- ATV-1 Demo Day 1
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/12/08 -- ATV-1 Demo Day 2
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)

04/24/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 02/01/08
Date:	Saturday, February 02, 2008 1:20:44 AM
Attachments:	

ISS On-Orbit Status 02/01/08

All ISS systems continue to function nominally, except those noted previously or below. ***Happy Birthday, Dan!***

FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Before breakfast, CDR Whitson completed her 120-Day NUTRITION/w Repository session (blood collection only). Whitson also set up NUTRITION w/Repository hardware for the 24-hour urine sample collections that will begin tomorrow morning and end Sunday morning.

Also before breakfast, CDR Whitson, FE-1 Malenchenko and FE-2 Tani started the day with the periodic session of the Russian biomedical routine assessments PZEh-MO-7/Calf Volume Measurement and PZEh-MO-8/Body Mass Measurement (third for CDR & FE-1, second for FE-2), using the IM mass measurement device which Yuri Malenchenko afterwards broke down for stowage. *[Calf measurements (left leg only) are taken with the IZOG device, a custom-sewn fabric cuff that fits over the calf, using the knee and lower foot as fixed reference pints, to provide a rough index of deconditioning in zero-G and effectiveness of countermeasures. For determining body mass in zero-G, where things are weightless but not massless, the Russian IM "scales" measure the inertial forces that arise during the oscillatory motion of a mass driven by two helical metering springs with known spring constants. By measuring the time period of each oscillation of the unknown mass (the crewmember) and comparing it to the period of a known mass, the crewmember's mass is calculated by the computer and displayed.]*

FE-2 Dan Tani assisted ground controllers in MCC-Houston by successfully walking the SSRMS (Space Station Remote Manipulator System) from the MBS (Mobile Base System to the Node-2 PDGF (Power & Data Grapple Fixture. *[The SSRMS is now in the 1E start position. Robotics ground controllers also translated the MT from WS4 (Worksite 4) to the WS7 for Flight 1E. The MT translation was successful, but only one of two IMCA (Integrated Motor/Controller Assembly) "ready for latch" microswitches on the primary string showed ready for latching at WS7. Ground controllers switched to the redundant string and both microswitches on that string showed ready for latching, then switched back to the primary string and both microswitches showed ready for latching at that time. The MT was successfully latched at WS7 and keep alive power was restored to the MBS. The MT will be translated back to WS4 after Flight 1E.]*

FE-1 Yuri Malenchenko and CDR Whitson installed the StM Docking Mechanism between Progress M-62/27P and the DC1 nadir port. *[The StM is the "classic" probe-and-cone type, consisting of an active docking assembly (ASA) with a probe (SSh), which fits into the cone (SK) on the passive docking assembly (PSA) for initial soft dock and subsequent retraction to hard dock. The ASA is mounted on the Progress' cargo module (GrO), while the PSA sits on the docking ports of the SM, FGB and DC1. 26P is being prepared for potential remote-commanded undocking in case of a docking contingency during the relocation of 14S, carrying the three crewmembers, from the FGB nadir port to the SM aft port.]*

Malenchenko and Whitson also conducted another TORU OBT (Tele-operator Control System On-Board Training) session in preparation for the docking of 28P on *[The TORU training session consisted of procedure and docking data reviews, a tagup with ground instructors, and onboard simulator training. 27P will undock from ISS on 2/4 (5:27am EST). 28P will dock to ISS on 2/7 (9:38am EST).]*

Tani completed various EVA equipment preparation and reconfiguration tasks today, including EMU (Extravehicular Mobility Unit) water refills and cooling loop scrubs, cooling loop configurations, and METOX (Metal Oxide) regeneration operations. *[EVA Postscript: It was reported that during the Airlock (A/L) hatch closing at the end of EVA-14, a tether was caught in the hatch requiring the hatch to be re-opened to remove the tether before re-closing. Ground specialists speculated that the tether might have damaged the hatch seal due to this event. Further review has determined the part of the tether caught in the hatch was Nomex cloth which would not have damaged the A/L hatch seal. Additionally, positive indication of seal integrity was provided by the leak check during A/L repressurization. No further analysis is planned at this time.]*

TsUP-Moscow conducted a successful retest of the Medium Gain-2 (WAS2) antenna as part of the PCE (Proximity Communication Equipment) checkout required for ATV-1 (Automated Transfer Vehicle 1) rendezvous and docking. *[The retest required an attitude*

control handover from USOS (US Segment) momentum management control to RS (Russian Segment) thruster control (~11:50am EST) and back (~2:35pm). The attitude for the test was LVLH (Local Vertical/Local Horizontal) 0, 0, 0. TsUP specialists indicated the WAS2 antenna passed today's test.]

Peggy worked with the DCS-760 still cameras, taking blank and white images to "clean" and calibrate the CCDs (Charge-Coupled Devices). The test photos were stored on a 1GB Microdrive PCMCIA and downlinked to MCC-Houston for determining which cameras will be used for the actual RPM activities before STS-122/1E docking.

Yuri completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Working off his discretionary "time permitting" task list, the FE-1 also performed the daily 20-min. IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

At ~3:35am EST, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~9:20am, the station residents convened for their weekly teleconference with ISS Program Management at JSC/Houston via S-band/audio.

At ~2:40pm, the crew was scheduled for their eighth weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC-10 (Station Support Computer 10)]*.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

Peggy then transferred the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

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Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/31/08
Date:	Friday, February 01, 2008 12:06:01 AM
Attachments:	

ISS On-Orbit Status 01/31/08

All ISS systems continue to function nominally, except those noted previously or below. *Light duty day today for the crew following yesterday's successful EVA. >>>>Today 50 years ago, the U.S. launched its first Earth satellite, Explorer 1, on a Redstone/Jupiter rocket built by the Wernher von Braun team for the Army Ballistic Missile Agency (ABMA). The satellite, developed by JPL and equipped with radiation sensors by Dr. James Van Allen, discovered the Van Allen Radiation Belts of Earth.<<<<*

FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan wears a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

After yesterday's successful EVA-14 spacewalk, CDR Whitson performed clean-up work in the Airlock (A/L), starting the discharge cycle on the 16V EMU batteries (~5-7 hrs), and later initiating their recharge.

To prepare for next week's (2/4) undocking of Progress M-62/27P, FE-1 Malenchenko dismantled and removed electronic equipment from the cargo ship, to be recycled. Removed were the US-21 matching unit, the cargo ship's LKT local temperature sensor commutator (TA251MB) of the BITS2-12 and its PZU-1M ROM (read-only memory) unit. *[When a Progress is undocked and jettisoned, the valuable electronics are retained, to be recycled on a future vehicle.]*

In the Service Module (SM), Malenchenko turned off the JAXA-3DPC (Japan Aerospace Exploration Agency-3D Photon Crystals) crystal growth experiment, running since 1/22. *[The purpose of this investigation is to grow photonic crystals*

in microgravity using particles in electrolytic solutions that will be fixed using ultraviolet light in a process referred to as photocuring, after self-organization and ordering of colloid nanoparticles in an electrolyte solution with subsequent fixation in an elastic gel matrix.]

In the Lab, Whitson connected the regular ITCS LTL (Internal Thermal Control System/Low Temperature Loop) coolant jumper at the LAB1D6 rack in support of ground-commanded activation of the U.S. CDRA (Carbon Dioxide Removal Assembly).

Yuri conducted the daily monitoring, picture-taking and downloading on the newly set up BIO-5 Rasteniya-2 ("Plants-2") experiment. *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. During the duration of the BI O-5 experiment, students of the Moscow City Palace for Youth Creativity of the Meshchansky inter-regional center #15 in Moscow) and the Prince of Oldenburg Lyceum in St. Petersburg will be cultivating plants in parallel on the ground and conducting comparative observation of plant growth and development under gravity and zero-gravity conditions. They are receiving the photo images taken by Yuri.]*

The FE-2 reconfigured the DCS-760 digital camera used during the EVA for its return to monitoring the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 and EVA-14 photo support). *[The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour.]*

After reviewing the video tape of their last (11/29/07) training session for the Shuttle RPM (R-bar Pitch Maneuver) picture-taking, Whitson and Malenchenko conducted another standard 30-min RPM imaging skill training, Peggy's fifth, Yuri's sixth, using DCS-760 digital still cameras in the SM to take photos of an Orbiter cut-out for practice, using the 400mm & 800mm telephoto lenses. *[The skill training prepares crewmembers for the bottomside mapping of the Orbiter at the arrival of STS-122/1E next week (2/9). During the RPM at ~600 ft from the station, the ISS crew will have only ~90 seconds for taking high-resolution digital photographs of all tile areas and door seals on the Atlantis from SM windows 6 & 8, to be downlinked for launch debris assessment. Thus, time available for the shooting will be very limited,*

requiring great coordination between the two headset-equipped photographers and the Shuttle.]

To provide access to the TORU panel for the subsequent refresher test, the FE-1 relocated the ATV (Automated Transfer Vehicle) control panel in the SM. *[TORU lets an SM-based crewmember perform the approach and docking of automated Progress vehicles in case of KURS failure.]*

Yuri and Peggy then conducted a 40-min. refresher teleconference on the upcoming (2/7) Progress 28P docking using the TORU manual backup control system in a vehicle-to-vehicle test.

The CDR ran the periodic check of active U.S. payloads, i.e., cleaning the ANITA (Analyzing Interferometer for Ambient Air) inlet plus inspecting and filter cleaning of the CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) incubator payload. *[The CGBA incubator is controlled from the ground, with automatic video downlinked to Earth. ANITA continues to collect data every six seconds and downlinks the data daily to the ground team. ANITA monitors low levels of potential gaseous contaminants in the ISS cabin atmosphere with a capability of simultaneously monitoring 32 gaseous contaminants. The experiment is testing the accuracy and reliability of this technology as a potential next-generation atmosphere trace-gas monitoring system for ISS and future spacecraft. This is a cooperative investigation with ESA.]*

Whitson also powered down the A31p laptop in the A/L, required during the Campout.

As part of post-EVA cleanup activities, FE-1 Yuri Malenchenko recorded the “Pille” radiation readings from the EMU-worn (plus one background) “Pille-MKS” dosimeters in a log table for subsequent downlink to the ground.

Other cleanup activities performed by Peggy and Dan during the day were –

- Disconnecting the UOP DCP (Utility Outlet Panel/Display & Control Panel) bypass power cables at the Lab RWS (Robotics Work Stations), used during the EVA for SSRMS (Space Station Remote Manipulator System) video coverage,
- Powering down the no-longer-needed A31p PCS (Portable Computer System) laptop in the Airlock (A/L), and
- Initiating and monitoring regeneration of the used EMU METOX (Metal Oxide) canisters in the A/L bakeout oven.

Malenchenko switched the SM ham radio station to Repeater Mode. *[Repeater mode allows radio amateurs to conduct ham radio sessions using ISS radio station*

during their pass. For example, amateur operator from Moscow can have a voice session with an operator in Paris. Voice radio contacts are typically conducted in auto mode without crew's involvement; however, the crew has a capability to participate in the exchange. This mode is distinguished by the fact that uplink should be set in one VHF frequency (i. e. 144-146 MHz), and downlink in another (430-440 MHz), and vice versa.]

Dan Tani worked on prepacking return items for STS-122/1E.

The CDR conducted the weekly 10-min. CWC audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week (currently #16-0018O).]*

In the Lab, CDR Whitson set up the NUTRITION/Repository hardware for upcoming urine and blood collections.

Yuri completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Working off his discretionary "time permitting" task list, the FE-1 also performed the daily 20-min. IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Peggy took air samples for the periodic (weekly) atmospheric status check for ppO_2 (Partial Pressure Oxygen) and $ppCO_2$ (pp Carbon Dioxide), using the hand-held CSA-CP (Compound Specific Analyzer-Combustion Products), CSA-O_2 (CSA - Oxygen sensor) and CDMK (CO_2 Monitoring Kit). Batteries were to be replaced if necessary. *[Purpose of the 15-min activity is to trend with MCA (Major Constituents Analyzer), i.e., to correlate the hand-held readings with MCA measurements.]*

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

Tani then transferred the crew's exercise data file to the MEC (Medical Equipment Computer) for downlink, as well as the daily wristband HRM data of the workouts on

RED, followed by their erasure on the HRM storage medium (done six times a week).

Significant Events Ahead *(all dates Eastern Standard, some changes possible.):*
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/30/08
Date:	Wednesday, January 30, 2008 11:38:19 PM
Attachments:	

ISS On-Orbit Status 01/30/08

All ISS systems continue to function nominally, except those noted previously or below.

Stage EVA-14 by CDR Peggy Whitson & FE-2 Dan Tani was completed successfully in 7hr 10min, accomplishing its objectives.

During the spacewalk, Whitson (EV1) & Tani (EV2), supported by FE-1 Yuri Malenchenko as intravehicular (IV) crewmember, removed the failed Stbd (right-side) BMRMM (Bearing Motor Roll Ring Module) and replaced it with a new spare, followed by more investigation and photo documentation of the Stbd SARJ (Solar Alpha Rotary Joint). *[The S4-1A BMRRM removal & replacement task was completed successfully. There was an S-band communication problem toward the beginning of the EVA that was cleared with a BSP (Baseband Signal Processor) power cycle. The communication dropout happened before the crew got into critical operations and was recovered in time to have very little effect on the overall EVA timeline. After the new BMRRM was installed all the power channels were reconfigured and the BGA was rotated and checked out successfully. Afterwards, the BGA was in autotrack and performing nominally. The removed BMRRM was brought back inside and will be stowed for return on the next available Shuttle flight. Per plan, there was time for the EVA crew to remove and inspect under several starboard SARJ covers. Eight of the remaining thirteen covers were inspected, leaving five more to be inspected on a later EVA. Photos taken during this activity are being downlinked for review by the SARJ troubleshooting team.]*

[Official start time of the spacewalk was 4:56am EST, 34 minutes ahead of the timeline, ending at 12:06pm. Total EVA duration (PET = Phase Elapsed Time) was 7h 10min. It was the 101st spacewalk for ISS assembly & maintenance and the 73rd from the station (28 from Shuttle, 51 from Quest, 22 from Pirs) totaling 443h 13min, and the 5th for Expedition 16 (totaling 35h 21min. During the spacewalk, her

sixth, Peggy Whitson set a new record of aggregated EVA time by a woman of 39h 46min when she exceeded her previous mark of 32h 36m. After today's EVA, a total of 123 spacewalkers (92 NASA astronauts, 21 Russians, and ten astronauts representing Japan-1, Canada-4, France-1, Germany-1 and Sweden-3) have logged a total of 631h 35min outside the station on building, outfitting and servicing. It was also the 123rd spacewalk by U.S. astronauts.]

Whitson and Tani began their overnight Campout prebreathe and lockout in the A/L at ~2:50pm EST. With METOX (Metal Oxide) canisters for CO2 removal in the A/L, the two spacewalkers will perform start PBA mask prebreathe for denitrogenation, while readying their equipment, then depress the A/L to 10.2 psi for the campout.

Prior to the spacewalk, FE-1 Malenchenko verified closure of the protective Lab window shutter.

Malenchenko also completed the pre-egress reconfiguration of the Russian STTS (onboard telephone/telegraph subsystem) to its EVA settings. After the crew's return, Yuri reconfigured the STTS for nominal ops. *[The "Voskhod-M" STTS enables telephone communications between the SM (Service Module), FGB, DC1 Docking Compartment and U.S. segment (USOS), and also with users on the ground over VHF channels selected by an operator at an SM comm panel, via STTS antennas on the SM's outside. There are six comm panels in the SM with pushbuttons for accessing any of three audio channels, plus an intercom channel. Other modes of the STTS include telegraphy (teletype), EVA voice, emergency alarms, Packet/Email, and TORU docking support.]*

During the spacewalk, Yuri provided IV support, prepared the DCS 760 camera setup for post-ingress photographing of the EVA gloves and subsequently assisted the spacewalkers in ingressing, CL (Crew Lock) repressurization and post-EVA activities.

The FE-1 also performed the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM (Service Module). *[Regular daily SOZh maintenance consists among else of replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

After returning on board from outside, Whitson and Tani doffed the EMUs, after taking photographs of the gloves and overgloves while still pressurized. As part of post-EVA tasks, the spacewalkers also reported on size fit of their EMUs and components.

Later today, CDR Whitson will downlink the EVA imagery to the ground and

reconfigure the DCS 760 for regular use (e.g., removing its thermal blanket).

Afterwards, Peggy and Dan were also scheduled for their regular post-EVA PMCs (Private Medical Conferences) with the ground.

No CEO (Crew Earth Observation) targets uplinked for today.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 8:38am EST [= epoch]):
Mean altitude -- 336.9 km
Apogee height -- 340.7 km
Perigee height -- 333.2 km
Period -- 91.28 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005597
Solar Beta Angle -- 27.6 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.78
Mean altitude loss in the last 24 hours -- 213 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52665

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/29/08
Date:	Tuesday, January 29, 2008 5:28:45 PM
Attachments:	

ISS On-Orbit Status 01/29/08

All ISS systems continue to function nominally, except those noted previously or below.

FE-1 Malenchenko set up the pumping equipment and initiated (later closed out) the periodic transfer of urine from five EDV-U containers in the SM (Service Module) to the Rodnik BV2 tank of Progress M-62/27P.

With the Elektron-VM O_2 (oxygen) generator currently off, a one-hour cabin air refresh was to be performed by the FE-1 from Progress 27P storage (SrPK) if required.

CDR Whitson conducted the periodic (every two weeks) 10-min inspection of the RED (Resistive Exercise Device) canister cords and accessory straps as well as the canister bolts for re-tightening if required.

Malenchenko completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Working off his "time permitting" discretionary job list, Yuri performed the daily 20-min. IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

At ~8:45am EST, the crew conducted a teleconference with the Shuttle crew of STS-122/1E, scheduled for launch on 2/7.

At ~9:40am, Peggy, Dan and Yuri tagged up with EVA specialists at MCC-H to discuss final arrangements for tomorrow's EVA-14 spacewalk.

Spending time in the Airlock (A/L) for final preparations for EVA-14, Peggy Whitson and Dan Tani –

- Configured the DCS-760 digital camera and flash attachment to be taken outside,
- Recharged three batteries for the EVA EMU-prebreathe period, to be installed in the EVA photo flash unit and EVA camera just prior to the spacewalk (when off station power),
- Prepared the A/L EL (Airlock Equipment Lock) for the Campout & spacewalk,
- Tagged up with ground specialists at ~9:40am EST for reviewing EVA particulars, and
- Underwent the standard pre-EVA PMC (Private Medical Conference) via S- & Ku-band audio/video.

Yuri prepared three Russian "Pille-MKS" radiation dosimeters, recorded their dosages and equipped each of the two EMUs (Extravehicular Mobility Unit) with a radiation sensor (A0309/CDR & A0310/FE-2). *[A third sensor, A0308, was placed in the SM on the PULT reader for background readings.]*

The CDR powered down the ham radio equipment in SM (Service Module) and FGB at ~12:30pm to prevent RF interference with the EMUs during the spacewalk. Peggy also closed the protective Lab science window shutters.

The crewmembers completed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1, FE-2), RED resistive exercise device (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

Whitson then transferred the crew's exercise data file to the MEC for downlink, as well as the daily wristband HRM data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~2:50pm EST, Whitson and Tani began their overnight Campout prebreathe and lockout in the A/L. With METOX (Metal Oxide) canisters for CO_2 removal in the A/L, the two spacewalkers performed PBA (Portable Breathing Apparatus) mask prebreathe for denitrogenation, while readying their equipment, then depressed the A/L to 10.2 psi for the campout.

After the 8.5-hr sleep period before the spacewalk, the A/L CL (Crewlock) hatch will be cracked at ~1:00am EST for a hygiene break/with mask prebreathe for Whitson and Tani, after spending the night on 10.2 psi. Around 2:10am, the hatch will be

closed again by IV Yuri Malenchenko for EVA preparations in 10.2 psi, followed by EMU purge & prebreath. Afterwards, Yuri will support CL depressurization and EV1 & EV2 will egress (~5:20-5:30am).

CEO photo targets uplinked for today were **IPY – Aurora Borealis**; **Heard Island, S. Indian Ocean** *(clear weather windows continue to be present in the region of Heard Island at the time of the ISS orbit pass. Looking to the right of track as ISS approached Antarctica. Mapping photography of the island was requested to capture snow and ice extent. The island of Kerguelen may also be visible to the northwest of Heard Island),* and **Patagonian Glaciers, S. America** *(this orbit track provided a traverse across the central portion of the Patagonian ranges. Overlapping, nadir mapping frames of glaciers on the western side of the mountains were requested)*.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 8:17am EST [= epoch]):
Mean altitude -- 337.1 km
Apogee height -- 340.9 km
Perigee height -- 333.4 km
Period -- 91.28 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005612
Solar Beta Angle -- 29.6 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.78
Mean altitude loss in the last 24 hours -- 202 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52649

Significant Events Ahead *(all dates Eastern Standard, some changes possible.):*
01/30/08 -- EVA-14 (BMRRM R&R, ~6 hrs)
01/31/08 -- **Explorer-1 50 Years (1st U.S. Satellite on Redstone rocket)** *[see http://usspace50.com* & http://www.us50thspace.com *]*
02/04/08 -- Progress M-62/27P undocking (5:30am) & reentry
02/05/08 -- Progress M-63/28P launch (8:03am)
02/07/08 -- Progress M-63/28P docking (9:38am)
02/07/08 -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite. ~2:40pm EST

02/18/08 -- STS-122/Atlantis/1E landing (KSC: ~8:55am)
02/22/08 -- ATV-1 “Jules Verne” launch/Ariane V (Kourou, French Guyana)
03/06/08 -- ATV-1 Demo Day 1
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/12/08 -- ATV-1 Demo Day 2
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/06/08 -- STS-119/Discovery/15A launch – S6 truss segment
11/08/08 -- STS-119/Discovery/15A docking
11/17/08 -- STS-119/Discovery/15A undocking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
04/15/09 -- **Constellation’s Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/28/08
Date:	Monday, January 28, 2008 1:50:37 PM
Attachments:	

ISS On-Orbit Status 01/28/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 15 of Increment 16.*

FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night on his Actiwatch, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink.

The FE-2 also performed standard switch-over maintenance on the starboard & portside Lab CCAA (Common Cabin Air Assembly) air conditioners, closing the ITCS LTL (Internal Thermal Control System/Low Temperature Loop) flow to the first (LAB1S6) and initiating it on the second (LAB1P6) unit. This is a periodic service task.

After the successful completion of the Stbd SARJ (Solar Alpha Rotary Joint) video inspection via MCC-H control, Dan Tani maneuvered the SSRMS (Space Station Remote Manipulator System) for the subsequent return of the MT (Mobile Transporter).

At ~5:05am EST (until ~7:50am), Russian thrusters were disabled while the MT (Mobile Transporter) traveled on its rail track from WS-2 (Worksite 2) back to WS-4.

CDR Whitson performed the periodic filter cleaning on the MSG AAA (Microgravity Science Glovebox/Avionics Air Assembly) which involved rotating the MSG Facility rack forward/down by ~50 deg, removing a rear panel, inspecting & cleaning the AAA filter and later reversing these steps.

Afterwards, the CDR retrieved InSPACE-2 payload components from temporary stowage, replaced them into their original locations inside the MSG WV (Work Volume) and removed a protective tape from the CA (Coil Assembly) on the

InSPACE Avionics Assembly. Peggy also cleaned the lens of the InSPACE-2 camera #2.

TsUP-Moscow performed several ground-commanded tests on RS (Russian Segment) systems:

- PCE (Proximity Communications Equipment, MBRL) transmitter 1,2 (PRD1,2) tests involving ISS attitude change (during PCE testing, Peggy kept the protective Lab science window shutters closed);
- SM ODU (Service Module Integrated Propulsion System) BG2 tank refill from Progress 27P; and
- KLEST-154 TV camera test.

FE-1 Malenchenko meanwhile performed the periodic (generally monthly) service of the ESA/RSC-Energia experiment ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS), removing the PCMCIA memory card #938 from the AST spectrometer's slot and replacing it with #942 to continue operations, then testing #938 on the RSK1 laptop for data quantity and total size of files, before stowing it for later return to Earth.

With the Elektron-VM O_2 (oxygen) generator currently off, a one-hour cabin air refresh was to be performed by the FE-1 from Progress 27P storage (SrPK) as required.

Dan Tani worked in the U.S. Airlock on gathering and configuring EVA tools for the 1/30 EVA-14. Later, the three crewmembers reviewed the latest EVA timeline and procedures list before tagging up with ground specialists at ~12:35pm to discuss issues and details.

Dan also changed the VDS VTR (Video Distribution System/Video Tape Recorder) tape for continued ground playback of recorded HDTV footage.

After Houston Flight Controllers started deactivating the CDRA (Carbon Dioxide Removal Assembly) after yesterday's SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellites) experiments and cooling was no longer required, the CDR disconnected the ITCS LTL QD (Internal Thermal Control System/Low Temperature Loop/Quick Disconnect) jumper to the CDRA rack (LAB1D6).

The FE-2 took air samples for the periodic (currently daily) atmospheric status check for ppO_2 (Partial Pressure Oxygen) and $ppCO_2$ (pp Carbon Dioxide), using the hand-held CSA-CP (Compound Specific Analyzer-Combustion Products), CSA-O_2 (CSA -Oxygen sensor) and CDMK (CO_2 Monitoring Kit). Batteries were to be

replaced if necessary. *[Purpose of the 15-min activity is to trend with MCA (Major Constituents Analyzer), i.e., to correlate the hand-held readings with MCA measurements.]*

Later, Tani disassembled and removed the equipment used earlier for transmission & downlinking of analog (as opposed to digital) video signals from the RS via the MPEG-2 (Moving Pictures Expert Group 2) encoder and Ku-band in "streaming video" packets over the U.S. OpsLAN and Ku-band.

The FE-1 completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

The crewmembers performed their regular 2.5-hr physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Peggy copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Working off his discretionary "time permitting" task list for today, Malenchenko completed the daily monitoring, picture-taking and downloading on the newly set up BIO-5 Rasteniya-2 ("Plants-2") experiment. *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. During the duration of the BI O-5 experiment, students of the Moscow City Palace for Youth Creativity of the Meshchansky inter-regional center #15 in Moscow) and the Prince of Oldenburg Lyceum in St. Petersburg will be cultivating plants in parallel on the ground and conducting comparative observation of plant growth and development under gravity and zero-gravity conditions. They are receiving the photo images taken by Yuri.].*

No CEO (Crew Earth Observation) targets uplinked for today.

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http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/

http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 7:56am EST [= epoch]):
Mean altitude -- 337.3 km
Apogee height -- 341.0 km
Perigee height -- 333.7 km
Period -- 91.28 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005434
Solar Beta Angle -- 31.2 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 133 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52633

Significant Events Ahead *(all dates Eastern Standard, some changes possible.):*
01/30/08 -- EVA-14 (BMRRM R&R, ~6 hrs)
01/31/08 -- **Explorer-1 50 Years (1st U.S. Satellite on Redstone rocket)** *[see http://usspace50.com* & http://www.us50thspace.com *]*
02/04/08 -- Progress M-62/27P undocking (5:27am) & reentry
02/05/08 -- Progress M-63/28P launch (8:03am)
02/07/08 -- Progress M-63/28P docking (9:33am)
02/07/08 -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite. ~2:40pm EST
02/09/08 -- Progress M-
02/22/08 -- ATV-1 “Jules Verne” launch/Ariane V (Kourou, French Guyana)
03/06/08 -- ATV-1 Demo Day 1
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03/12/08 -- ATV-1 Demo Day 2
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
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04/24/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch

08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
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11/08/08 -- STS-119/Discovery/15A docking
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04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
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Note: The daily ISS On-Orbit Status reports can also be found at
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/27/08
Date:	Sunday, January 27, 2008 5:47:56 PM
Attachments:	

ISS On-Orbit Status 01/27/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday -- off-duty day for CDR Whitson, FE-1 Malenchenko and FE-2 Tani except for housekeeping and voluntary work. Ahead: Week 15 of Increment 16.*

FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night on his Actiwatch, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink.

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the Service Module (SM) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the CDR's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

Whitson and Tani supported the second part of the Stbd SARJ (Solar Alpha Rotary Joint) inspection via ground control, by maneuvering the SSRMS (Space Station Remote Manipulator System) to the position for surveying the Datum A surface. *[During each inspection, the SARJ was rotated using 12 degree directed positioning moves every 5 minutes (requires 8 orbits for a full 360 degree inspection). Meanwhile, ground analysis of the root cause of the roller surface failure continues. Power analyses for upcoming missions are scheduled to be completed over the next month. SARJ cleaning and lubrication techniques are being evaluated. A grease gun will be added to 1E manifest. ULF-2 manifest will likely have 12 TBAs (Trundle Bearing Assemblies) and 1 DLA (Drive Lock Assembly). Increment 18 and ULF-2 crew will receive training on outboard mode R&R and SARJ cleaning*

operations.]

For the duration of the SSRMS inspection, Peggy kept the protective Lab science window shutters closed (~1:30pm-3:08am tomorrow morning).

With the Elektron-VM O_2 (oxygen) generator currently off, a 5-min cabin air refresh was to be performed by the FE-1 from Progress 27P storage (SrPK) as required.

Tani performed his daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 photo support). *[The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour.]*

The FE-1 completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

In the U.S. Airlock, the CDR terminated EMU (Extravehicular Mobility Unit) battery charging in preparation for next week's EVA-14 (1/30).

Later, at ~12:05pm EST, Whitson and Tani conducted a 45-min tagup with ground specialists to discuss their EVA-14 next week (1/30).

Peggy took air samples for the periodic (currently daily) atmospheric status check for ppO_2 (Partial Pressure Oxygen) and $ppCO_2$ (pp Carbon Dioxide), using the hand-held CSA-CP (Compound Specific Analyzer-Combustion Products), CSA-O_2 (CSA -Oxygen sensor) and CDMK (CO_2 Monitoring Kit). Batteries were to be replaced if necessary. *[Purpose of the 15-min activity is to trend with MCA (Major Constituents Analyzer), i.e., to correlate the hand-held readings with MCA measurements.]*

After assisting CDRA (Carbon Dioxide Removal Assembly) activation yesterday in support of today's session with the SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellites) payload, which he had selected for his VolSci (Voluntary Weekend Science) program, Dan Tani had ~2.5 hrs for conducting another session with the payload. *[Today's session concentrated on the ability of a single crewperson to deploy two satellites. Due to the different air flows introduced with the addition of Node-2, the former operational environment*

has changed, making multi-satellite deployments more challenging. The SPHERES experiment is a test bed for the development and testing of formation flying and other multi-spacecraft control algorithms. SPHERES, done first by Exp-13 FE-1 Jeff Williams, serves to mature autonomous satellite formation flight, rendezvous and docking algorithms in a long duration, microgravity environment. Dan set up the Work Area, dimmed GLAs (General Luminaire Assemblies), programmed & deployed two gas-propelled satellites (orange, red, blue), with five beacons, and used two PD-100 camcorders for video capture, changing the VTR tape as required. Per applicable Flight Rule, SPHERES operations have no CO_2 (Carbon Dioxide) output constraints if the CDRA (CO_2 Removal Assembly) is operating in dual-bed or single-bed mode. Should CDRA not work properly, ECLSS (Environmental Control & Life Support System) engineers will assess the $ppCO_2$ flight rule requirement. The experiment run was time-critical since Ku-band is required for real-time video downlink.]

Yuri Malenchenko had ~30 min to provide “turn-on/turn-off” support to TsUP-Moscow for the ongoing testing (Test 1) of the ATV PCE (Automated Transfer Vehicle/Proximity Communications Equipment; Russian: MBRL).

With the Elektron-VM O_2 (oxygen) generator currently off, a 5-min cabin air refresh was to be performed by the FE-1 from Progress 27P storage (SrPK) as required.

The crewmembers performed their regular 2.5-hr physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

The crewmembers had their weekly PFCs (Private Family Conferences) via S-band/ audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-9 laptop), Yuri at ~6:00am, Peggy at ~12:50pm, and Dan at ~2:19pm.

Malenchenko had three new items on his discretionary “time permitting” task list for today –

- the daily monitoring, picture-taking and downloading on the newly set up BIO-5 Rasteniya-2 ("Plants-2") experiment. *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/*

video recording. During the duration of the BI O-5 experiment, students of the Moscow City Palace for Youth Creativity of the Meshchansky inter-regional center #15 in Moscow) and the Prince of Oldenburg Lyceum in St. Petersburg will be cultivating plants in parallel on the ground and conducting comparative observation of plant growth and development under gravity and zero-gravity conditions. They are receiving the photo images taken by Yuri.];

- his sixth run of the Russian DZZ-2 "Diatomeya" ocean observations program, using the NIKON-F5 still camera with 80-200 mm Nikkor zoom lens and the SONY PD-150P camcorder to observe bioproductive processes in Southern Atlantic and Indian Oceans in summer at the Southern Hemisphere. *[Uplinked target zones in the Atlantic Ocean were coastal area of Brazil -- Agulhas subsea depression (RSA area), and the Falkland-Patagonia commercial-production area - Gulf of Guinea (Cameroon), in the Atlantic & Indian Oceans the La Plata estuary (Argentina) – Mascarene Ridge subsea area.]*; and
- completed another radiation data monitoring & logging session for flow & dose power data with the Matryoshka-R radiation payload and its LULIN-5 electronics box. *[Accumulated readings were recorded on a log sheet for subsequent downlink to TsUP/Moscow via the BSR-TM payload data channel.]*

No CEO (Crew Earth Observation) targets uplinked for today.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this “Gateway” site);
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ISS Orbit (as of this morning, 7:35am EST [= epoch]):
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Perigee height -- 333.7 km
Period -- 91.28 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005561
Solar Beta Angle -- 32.2 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 65 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52617

Significant Events Ahead *(all dates Eastern Standard, some changes possible.):*
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02/05/08 -- Progress M-63/28P launch (8:03am)
02/07/08 -- Progress M-63/28P docking (9:33am)
02/07/08 -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite. ~2:40pm EST
02/09/08 -- Progress M-
02/22/08 -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana)
03/06/08 -- ATV-1 Demo Day 1
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/12/08 -- ATV-1 Demo Day 2
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/06/08 -- STS-119/Discovery/15A launch – S6 truss segment
11/08/08 -- STS-119/Discovery/15A docking
11/17/08 -- STS-119/Discovery/15A undocking

11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/26/08
Date:	Saturday, January 26, 2008 12:10:21 PM
Attachments:	

ISS On-Orbit Status 01/26/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday -- off-duty day for CDR Whitson, FE-1 Malenchenko and FE-2 Tani except for housekeeping and voluntary work.*

FE-1 Malenchenko finished Part 2 of his first stress test plus saliva and blood sampling of the ESA/Russian biomed experiment "IMMUNO" (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS), today completing remaining urine sample collections. Specimens were then stowed in a special urine containment bag (blood samples were secured yesterday in the MELFI {Minus Eighty Degree Celsius Laboratory Freezer for ISS} in cold packs). *[IMMUNO is a 24-hr. test of human immune system changes, with the objective to investigate immune neuro-endocrine reactions in the space environment by studying samples of saliva, blood and urine using collection kits and the biomedical (MBI) protection kit. Also included are entries in a fluid/medications intact log, and a stress-test questionnaire to be filled out by the subject at begin and end of the first day.]*

Today CDR Whitson installed the IWIS hardware in preparation for tomorrow's DTF. This will enable a total of 6 Remote Sensor Units (RSU) to collect data for the DTF on Saturday. Remote sensors were installed in the Airlock and Node 2. IWIS is a Station Development Test Objective (SDTO) that records structural measurements to validate math models used in loads analysis. The data will be used to reduce conservatism and might allow relaxation of operational constraints on activities such as crew exercise, vehicle dockings and reboosts that impart structural loads to ISS. The data will also provide more accurate fatigue calculations that could result in an extension of the ISS life.

In support of the end-to-end testing of the ATV PCE (Automated Transfer Vehicle/ Proximity Communications Equipment; Russian: MBRL), in the Service Module (SM) Malenchenko installed the ATV control panel (PU), the ATV hand controller, the "PCE Z0000" box, made the necessary BKS cable connections and also hooked up the BUAP (Antenna Switching Control Box) telemetry connectors to the BITS2-

12 onboard telemetry measurement system. The installation work was supported by ground specialist tagup via S-band.

With the Elektron-VM O_2 (oxygen) generator currently off, a 5-min cabin air refresh was to be performed by the FE-1 from Progress 27P storage (SrPK) as required.

Starting at ~8:37am EST, TsUP-Moscow conducted five SM thruster tests, each about one second in duration. For the test period, Peggy Whitson had closed the protective Lab science window shutters. The testing concluded at ~8:50am. *[Structural dynamics data were taken during the thruster testing by the IWIS (Internal Wireless Instrumentation System), with a total of 6 RSUs (Remote Sensor Units) collecting vibrational data. IWIS is an SDTO (Station Development Test Objective) that records structural measurements to validate math models used in loads analysis. The data will be used to reduce conservatism and might allow relaxation of operational constraints on activities such as crew exercise, vehicle dockings and reboosts that impart structural loads to ISS. The data will also provide more accurate fatigue calculations that could result in an extension of the ISS life.]*

In the Airlock, the CDR initiated EMU (Extravehicular Mobility Unit) battery charging in preparation for next week's EVA-14 (1/30).

Malenchenko meanwhile worked on the Russian SRVK-2M condensate water processor, removing its BKO multifiltration/purification unit, which has reached its service life limit, and replacing it with a new unit. The old BKO was stowed for deorbiting in Progress 27. *[The BKO, which contains five purification columns to remove dissolved mineral and organic impurities from the condensate, has a service lifetime of at least 450 liters throughput. The purified (deionized) water is used in the Elektron for electrolysis or, after treatment in the BKV water conditioning unit with salts for taste and silver ions for preservation, as potable water in the KPV container.]*

For her Voluntary Weekend Science (VolSci) program today, CDR Whitson conducted another session of the LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System)/Phase 2 operations, sampling three sites (which showed highest endotoxin levels during the December '07 sampling sessions). Plus two repeats of Negative Control (samples of clean water). *[The goal is to compare LOCAD results with the SSK colony growth results. LOCAD uses small, thumb-sized "microfluidic" cartridges that are read by the experiment reader. The cartridges contain dried extract of horseshoe crab blood cells and colorless dye. In the presence of the bacteria, the dried extract reacts strongly to turn the dye a green color. Therefore, the more green dye, the more microorganisms there are in the original sample. The handheld device tests this*

new analysis technology by sampling for the presence of gram negative bacteria in the sample in about 15 minutes, showing the results on a display screen. *Background:* *Lab-on-a-Chip technology has an ever-expanding range of applications in the biotech industry. Chips are available (or in development) which can also detect yeast, mold, and gram positive bacteria, identify environmental contaminants, and perform quick health diagnostics in medical clinics. The technology has been used to swab the MERs (Mars Exploration Rovers) for planetary protection. With expanded testing on ISS, began by Sunita Williams in March/April this year, this compact technology has broad potential applications in space exploration--from monitoring environmental conditions to monitoring crew health. The current study should prepare for long-duration exploration by demonstrating a system that enables the crew to perform biochemical analysis in space without having to return samples to Earth.]*

The FE-2 connected the ITCS LTL QD (Internal Thermal Control System/Low Temperature Loop/Quick Disconnect) jumper to the CDRA rack (LAB1D6) in support of the activation of the CDRA (Carbon Dioxide Removal Assembly) by MCC-Houston, which requires cooling.

Peggy took air samples for the periodic (currently daily) atmospheric status check for ppO_2 (Partial Pressure Oxygen) and $ppCO_2$ (pp Carbon Dioxide), using the hand-held CSA-CP (Compound Specific Analyzer-Combustion Products), CSA-O_2 (CSA -Oxygen sensor) and CDMK (CO_2 Monitoring Kit). Batteries were to be replaced if necessary. *[Purpose of the 15-min activity is to trend with MCA (Major Constituents Analyzer), i.e., to correlate the hand-held readings with MCA measurements.]*

Dan Tani performed his daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 photo support). *[The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour.]*

Dan also completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

The crewmembers performed their regular 2.5-hr physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED (CDR, FE-2) and VELO bike with bungee cord

load trainer (FE-1).

Afterwards, Peggy copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~9:00am EST, the crewmembers held their regular weekly planning conference (WPC) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP/Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

Robotics & SARJ Preview: Continuing the Stbd SARJ (Solar Alpha Rotary Joint) inspection via ground control, today (1/26) the SSRMS (Space Station Remote Manipulator System) was used to inspect the race ring's outer canted surface. Tomorrow, Sunday, the survey will focus on the Datum A surface. During each inspection, the SARJ is rotated using 12 degree directed positioning moves every 5 minutes (requires 8 orbits for a full 360 degree inspection). Meanwhile, ground analysis of the root cause continues. Power analyses for upcoming missions are scheduled to be completed over the next month. SARJ cleaning and lubrication techniques are being evaluated. A grease gun will be added to 1E manifest. ULF-2 manifest will likely have 12 TBAs (Trundle Bearing Assemblies) and 1 DLA (Drive Lock Assembly). Increment 18 and ULF-2 crew will receive training on outboard mode R&R and SARJ cleaning operations.

Weekly Science Update (Expedition Sixteen -- Week 14)

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Radiation measurements continue to be performed in the PIRS module. Next memory card replacement activity is currently planned on 1/28.

ANITA: Completed.

BCAT-3 (Binary Colloidal Alloy Test 3): “BCAT-3 Investigator, Peter Lu at Harvard, put together a short movie from the photos taken by astronaut Daniel Tani using EarthKAM to capture the time evolution of sample 3. This captured some great science and showed that the new set-up (improvised by Dan) is working very nicely. Even more excitement occurred when sample 4 began running. Sample 4 is the sample closest to the critical point (on the other side of the critical point) in the phase diagram. It should have a surface tension that is about an order of magnitude less than the previous sample and it was not expected to show structure. BUT, we are seeing something with the new setup, and it is allowing us to see very

low contrast images. These new patterns are not yet understood (are they critical fluctuations, bimodal decomposition, something else??). For a short period after sample 4 had been running for about a week and a half some of the images were not good (the camera may have been bumped), but fortunately, the daily camera check and Dan Tani caught this problem. We suspect that he corrected it and we are about to have a look at the new images that have just been downloaded (our camera guru, Jay Owens, will apprise us of the present situation and let everyone know). Because of the new science being seen with sample 4, we have delayed switching to sample 5 until February 4. Three cheers for having astronauts that have the skills and interest to adjust the camera and lighting to capture these difficult to see structures and the interest to check to see that the hardware is working (and right it when it's not)."

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): "Dan, currently you are scheduled to repeat the last CCISS session on 2/4 and 2/5. The session will need to be repeated due to the Shuttle launch slip moving your last session out of the PI requirements."

CFE (Capillary Flow Experiment): Reserve.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): In progress.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): In progress.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): First session of the experiment for FE-1 Yuri Malenchenko has started on 1/24. Activities continued on 1/25 and 1/26.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): In progress.

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Complete.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 "Pirs".

MULTIGEN-1: MULTIGEN-1 samples will be downloaded on STS-122 (1E).

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION/REPOSITORY: In progress.

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): "Peggy, thanks for downloading and initializing the Actiwatches. We verified the data and will be sending it to the PI. Dan, with your last download activity being completed your only remaining activities are 11 days of Sleep logging and doffing your Actiwatch on the Shuttle with other crewmembers. We are working to add the Sleep logging to the timeline for your convenience."

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): In progress.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: "Dan, the additional Ultrasound troubleshooting this week will be evaluated for a thorough examination of our HRF Rack 1 B1 drawer location. Last Friday's session helped give us a better understanding of the anomaly. We

appreciate your patience and interest in assisting in the identification of the anomaly."

CEO (Crew Earth Observation): Through 1/23 the ground has received a total of 12,027 frames of ISS/CEO imagery for review and cataloging. "We are pleased to report that your excellent imagery of three of our CEO targets meets or exceeds our current requirements and we can remove them from our standing target list: Luquillo Forest, Puerto Rico; Lake Poopo, Bolivia; and Perth, Australia. Kudos to the crew! Regarding IPY related targets, although we have found none of your atmospheric limb views with polar mesospheric clouds, we have identified your first Aurora imagery acquired over eastern Canada, and, what appears to be three frames of the mega iceberg A53a near South Georgia Island in South Atlantic Ocean. Other fine target area acquisitions under review include those for the South Tibesti Megafans in North Africa and the Patagonian Glaciers. Many of your images of cities at night are absolutely awesome! Your excellent, detailed view of the Port of Suez, Egypt will be published on NASA/GSFC's Earth Observatory website this weekend. You continue to provide us with a wealth of great astronaut photography of the Earth."

CEO photo targets uplinked for today were **Lake Eyre, Australia** *(weather was predicted to be mostly clear over Lake Eyre. Looking right of track for the lake basin. Context views of the region using the short lens were requested),* **Patagonian Glaciers, S. America** *(clear weather conditions continue over the northern Patagonian mountains. Overlapping, nadir mapping frames taken along track of summit glaciers and icefields were requested),* and **S. Georgia/S. Sandwich, S. Atlantic Ocean** *(gaps in cloud cover were expected over S. Georgia Island during this overpass. Mapping photography of snow and ice on eastern/ southeastern portion of the island was requested).*

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 7:29am EST [= epoch]):
Mean altitude -- 337.6 km
Apogee height -- 341.2 km
Perigee height -- 333.9 km
Period -- 91.28 min.
Inclination (to Equator) -- 51.64 deg

Eccentricity -- 0.0005386
Solar Beta Angle -- 32.7 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 65 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52601

Significant Events Ahead *(all dates Eastern Standard, some changes possible.):*
01/30/08 -- EVA-14 (BMRRM R&R, ~6 hrs)
01/31/08 -- **Explorer-1 50 Years (1st U.S. Satellite on Redstone rocket)** *[see http://usspace50.com* & http://www.us50thspace.com *]*
02/04/08 -- Progress M-62/27P undocking (5:27am) & reentry
02/05/08 -- Progress M-63/28P launch (8:03am)
02/07/08 -- Progress M-63/28P docking (9:33am)
02/07/08 -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite. ~2:40pm EST
02/09/08 -- Progress M-
02/22/08 -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana)
03/06/08 -- ATV-1 Demo Day 1
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/12/08 -- ATV-1 Demo Day 2
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
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08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/25/08
Date:	Friday, January 25, 2008 12:47:43 PM
Attachments:	

ISS On-Orbit Status 01/25/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Whitson & FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Upon wakeup, FE-1 Yuri Malenchenko terminated his eighth MBI-12 SONOKARD experiment session, started last night, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

For his first session of the ESA/Russian biomed experiment "IMMUNO", Yuri Malenchenko set up the IMMUNO urine collection hardware and took air samples with the IPD-NH_3 Draeger tubes sampler, testing for ammonia (NH_3) in the SM, then started the experiment. *[IMMUNO is a 24-hr. test of human immune system*

changes, with the objective to investigate immune neuro-endocrine reactions in the space environment by studying samples of saliva, blood and urine using collection kits and the biomedical (MBI) protection kit. Samples are secured in the MELFI (Minus-Eighty Laboratory Freezer for ISS). Also included are entries in a fluid/ medications intact log, and a stress-test questionnaire to be filled out by the subject at begin and end. Urine is collected during a 24-hour period, conventionally divided into two twelve-hour phases: morning-evening and evening-morning.]

At ~3:25am EST, the FE-2 again activated the VDS MPC (Video Distribution System/Multi-Purpose Converter) with its four downlinks to allow the ground to conduct HDTV (high-definition TV) playback and downlink operations. Later (~1:30pm), the MPC was powered off again. *[The end-to-end test of the system, conducted by the crew and ground specialists on 1/17 to verify the MPC HDTV (Multi-Purpose Converter/High-Definition TV) capability all the way to the NASA TV satellite, was very successful, yielding an overall end-to-end audio latency (delay) for the MPC System of 3.2 seconds. This is the delay from the crewmember to JSC/ MCC-H to NASA Headquarters and out to the NASA TV satellite in high definition (including, but are not limited to, CNNHD, ABC, NBC, CBS, and Discovery HD Theater), i.e. the sum total of the audio delay the interviewer and interviewee will "feel" during an interactive event. This Japan/JAXA originated system will be utilized soon for downlink messages and in-flight interviews based on client capability.]*

CDR Whitson and FE-2 Tani reviewed the POC DOUG (Portable Onboard Computer Dynamic Ubiquitous Graphics) software for the subsequent SSRMS activities, then conducted SSRMS operations by maneuvering the robotarm through an inchworm-like walk-off to the MT MBS (Mobile Transporter/Mobile Base System), detached it from Node-2 and re-based it (mathematically) on MBS PDGF-1 (Power & Data Grapple Fixture 1).

Afterwards, the MT was translated along its rail track to the Stbd SARJ (Solar Alpha Rotary Joint) inspection position, with Russian thrusters disabled during this period (~7:45am - 10:10am).

FE-1 Malenchenko supported TsUP-Moscow in the last of four days of ASN-M Satellite Navigation System testing, first transferring raw ASN date from the recent (1/22) ATV (Automated Transfer Vehicle) approach rehearsals from Laptop3 to PCMCIA memory card and setting it up for data downlinking to TsUP for analysis and determination how the test is proceeding, then tearing down and disassembling the ASN/laptop raw data gathering setup for subsequent stowage. *[The purpose of the week long testing is to confirm ASN-M hardware readiness for the upcoming ATV “Jules Verne” vehicle docking.]*

Continuing her preparations in the Airlock for EVA-14 next week, CDR Whitson spent some time cleaning out the small EVA trash bag.

With the Elektron-VM O_2 (oxygen) generator currently off, a 5-min cabin air refresh was to be performed by the FE-1 from Progress 27P storage (SrPK) as required.

Malenchenko had time set aside to take documentary photography of the current mounting location of the third REGUL-OS set (CA325) in the Service Module (SM) behind panel 338, to assess the feasibility of installing a new system in place of CA-325 at the Regul-OS work area. *[Regul-OS is the Russian radio control and communications system (RSUS), equivalent to the U.S. S-band system. It is the nominal uplink path for all Russian commanding, and it handles two-way voice comm, digital/command/program data, as well as telemetry via RGS (Russian ground sites).]*

In preparation for tomorrow's robotics activities causing structural dynamics, CDR Whitson installed IWIS (Internal Wireless Instrumentation System) accelerometer RSUs (Remote Sensing Units) in the Airlock and Node-2. RSUs are also iknstalled in the Lab, Node-1, FGB and SM (Sync Mode).

For upcoming experiments with the U.S. ULTRASOUND payload, the FE-2 set up and powered on the HRF1 (Human Research Facility1) rack drawers for troubleshooting the ULTRASOUND equipment (by checking light responses to inputs).

Continuing his troubleshooting of the Russian SKV2 air conditioner, the FE-1 inspected and replaced the inlet filter of the NOK-2 condensate evacuation pump. Removal & replacement of the NOK-2 pump is an additional task, currently listed on the Russian "time permitting" discretionary task list.

FE-2 Tani filled out the regular FFQ (Food Frequency Questionnaire), his 11th, on the MEC (Medical Equipment Computer). *[By means of these FFQs, U.S. astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins.]*

Dan also completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Peggy Whitson worked in the SM preparing (clearing) two panels (#226, #227) for the upcoming installation of the new ATV PCE (Automated Transfer Vehicle/ Proximity Communications Equipment; Russian: MBRL) and the BUAP antenna switching controller, along with their BKS cabling, in preparation for ATV docking at the SM aft end later this year.

The CDR took air samples for the periodic (currently daily) atmospheric status check for ppO_2 (Partial Pressure Oxygen) and $ppCO_2$ (pp Carbon Dioxide), using the hand-held CSA-CP (Compound Specific Analyzer-Combustion Products), CSA-O_2 (CSA -Oxygen sensor) and CDMK (CO_2 Monitoring Kit). Batteries were to be replaced if necessary. *[Purpose of the 15-min activity is to trend with MCA (Major Constituents Analyzer), i.e., to correlate the hand-held readings with MCA measurements.]*

Dan Tani performed his daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 photo support). *[The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour.]*

Yuri completed the daily 20-min. IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur), working off his voluntary task list.

Also off the “job jar” task list, the FE-1 performed the daily monitoring, picture-taking and downloading on the newly set up BIO-5 Rasteniya-2 ("Plants-2") experiment. *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. During the duration of the BI O-5 experiment, students of the Moscow City Palace for Youth Creativity of the Meshchansky inter-regional center #15 in Moscow) and the Prince of Oldenburg Lyceum in St. Petersburg will be cultivating plants in parallel on the ground and conducting comparative observation of plant growth and development under gravity and zero-gravity conditions. They are receiving the photo images taken by Yuri.]*

The crewmembers performed their regular 2.5-hr physical workout program (about

half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Tani copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~3:10am, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~8:20am, the CDR and FE-2 held a crew conference with the next U.S. flight engineer replacing Dan Tani, ESA Astronaut Léopold Eyharts.

At ~12:15pm, Peggy, Yuri and Dan conducted their standard bi-weekly teleconference with the JSC Astronaut Office (Steve Lindsey), via S-band S/G-2 audio & phone patch.

CEVIS Controller Failure: Yesterday (~6:37am EST), after CDR and FE-2 successfully completed PFE-OUM, the CEVIS (Cycle Ergometer with Vibration Isolation) control panel indicated failure of the cycle's controller. The crew was instructed to deploy the CEVIS Contingency Controller (CCC), although it cannot capture Heart Rate (HR) and load data, and to stow the control panel in the CEVIS accessories kit. The crew was also directed to the appropriate CEVIS procedure. CEVIS data will be downlinked and analyzed to determine if any troubleshooting is possible. The crew will be emailed protocols to be used with the CCC.

Robotics & SARJ Preview: Tomorrow (1/26) and on 1/27, the SSRMS (Space Station Remote Manipulator System) will be maneuvered to conduct the scheduled Stbd SARJ (Solar Alpha Rotary Joint) inspection via ground control. On Saturday, SSRMS will inspect the race ring's outer canted surface, while on Sunday the survey will focus on the Datum A surface. During each inspection, the SARJ will be rotated using 12 degree directed positioning moves every 5 minutes (requires 8 orbits for a full 360 degree inspection). Meanwhile, ground analysis of the root cause continues. Power analyses for upcoming missions are scheduled to be completed over the next month. SARJ cleaning and lubrication techniques are being evaluated. A grease gun will be added to 1E manifest. ULF-2 manifest will likely have 12 TBAs (Trundle Bearing Assemblies) and 1 DLA (Drive Lock Assembly). Increment 18 and ULF-2 crew will receive training on outboard mode R&R and SARJ cleaning operations.

CEO (Crew Earth Observation) photo targets uplinked for today were **Heard Island, S. Indian Ocean** *(a clear weather window was predicted to be present in the region of Heard Island at the time of this orbit pass. Looking to the right of track as ISS approached Antarctica. Mapping photography of the island was requested to capture snow and ice extent),* **IPY – Aurora Borealis***, followed by* **S. Georgia/S. Sandwich, S. Atlantic Ocean** *(some low clouds were predicted over these South Atlantic islands during this orbit pass, but the potential for useful photography was still high. Looking to the right of track for the islands. Mapping photography of snow and ice on eastern/southeastern portion of the island was requested. There may also have been sea ice visible to the S-SW of the island for photography, including a large iceberg [A53A].),* and **Patagonian Glaciers, S. America** *(ISS orbit track provided a traverse across the northern portion of the Patagonian ranges where clear weather conditions were predicted. Overlapping, nadir mapping frames of summit glaciers and icefields, taken along track, were requested)*.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 8:27am EST [= epoch]):
Mean altitude -- 337.6 km
Apogee height -- 341.3 km
Perigee height -- 333.9 km
Period -- 91.29 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005526
Solar Beta Angle -- 32.8 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 84 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52586

Significant Events Ahead *(all dates Eastern Standard, some changes possible.):*
01/30/08 -- EVA-14 (BMRRM R&R, ~6 hrs)
01/31/08 -- **Explorer-1 50 Years (1st U.S. Satellite on Redstone rocket)** *[see http://usspace50.com* & http://www.us50thspace.com *]*
02/04/08 -- Progress M-62/27P undocking (5:27am) & reentry
02/05/08 -- Progress M-63/28P launch (8:03am)
02/07/08 -- Progress M-63/28P docking (9:33am)
02/07/08 -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite. ~2:40pm

EST
02/09/08 -- Progress M-
02/22/08 -- ATV-1 “Jules Verne” launch/Ariane V (Kourou, French Guyana)
03/06/08 -- ATV-1 Demo Day 1
03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/12/08 -- ATV-1 Demo Day 2
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/06/08 -- STS-119/Discovery/15A launch – S6 truss segment
11/08/08 -- STS-119/Discovery/15A docking
11/17/08 -- STS-119/Discovery/15A undocking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
04/15/09 -- **Constellation’s Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at

http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/24/08
Date:	Thursday, January 24, 2008 5:41:42 PM
Attachments:	

ISS On-Orbit Status 01/24/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Whitson & FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Dan Tani dismantled the InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) experiment in the MSG (Microgravity Science Glovebox) and stowed the equipment, including the video gear.

CDR Whitson performed the periodic offloading of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1054) with the collected water slated for processing. No samples were required this time. *[Estimated offload time before termination (leaving ~6 kg in the tank): ~40 min.]*

The CDR also conducted the weekly 10-min. CWC audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week (currently #16-0018O).]*

Whitson and Tani set up and activated the OUM-PFE (Oxygen Uptake Measurement - Periodic Fitness Evaluation) equipment at the HRF-2 (Human Research Facility 2) rack for another session, requiring a CEVIS cycle ergometer

workout. Both crewmembers then completed the evaluation protocol, wearing HRMs (Heart Rate Monitors), with each one in turn acting as subject and operator, obtaining measurements on each other during the workout. The CEVIS control panel required some crew intervention. *[The equipment includes the HRF PFM/ PAM (Pulmonary Function Module/Photoacoustic Analyzer Module), Mixing Bag System and GDS (Gas Delivery System). In a change to previous procedures, the calibration of the DPFM (Differential Pressure Flowmeter) was done manually for the first time. Later, Peggy and Dan updated the evaluation protocol, deactivated & stowed the gear, and powered down the OUM-PFE laptop. Purpose of OUM-PFE is to measure aerobic capacity during exercise within 14 days after arrival on ISS, and once monthly during routine PFEs. The data allows exercise physiologists & flight doctors to assess the crew's health & fitness and to provide data for modifying & updating crew-specific exercise regimes. PFE-OUM is a collaborative effort between NASA and ESA (European Space Agency).]*

FE-1 Malenchenko again had several hours for trash transfers to Progress M-62/27P for disposal (2/4), tracking movements in the IMS (Inventory Management System).

Yuri also performed the daily monitoring, picture-taking and downloading on the newly set up BIO-5 Rasteniya-2 ("Plants-2") experiment. *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. During the duration of the BI O-5 experiment, students of the Moscow City Palace for Youth Creativity of the Meshchansky inter-regional center #15 in Moscow) and the Prince of Oldenburg Lyceum in St. Petersburg will be cultivating plants in parallel on the ground and conducting comparative observation of plant growth and development under gravity and zero-gravity conditions. They are receiving the photo images taken by Yuri.]*

With the Elektron-VM O_2 (oxygen) generator currently off, a 5-min cabin air refresh was to be performed by the FE-1 from Progress 27P storage (SrPK) as required.

Malenchenko conducted a search to gather the necessary equipment for the ATV (Automated Transfer Vehicle) hand controller of the PCE (Proximity Communications Equipment; Russian: MBRL) system preparatory to its installation on 1/26 for testing. *[To assess the impact of the installed Matryoshka gear on the planned installation of the PCE hand controller box, TsUP-Moscow sent up a picture of the PCE installed on the ISS in 2005.]*

CDR Whitson worked in the U.S. Airlock on preparations of the spacesuits for herself and Dan for EVA-14 on 1/30. *[After terminating battery recharge, Peggy installed REBA 1005 in EMU 3018 (Peggy's) and REBA 1011 in EMU 3006 (Dan's), PGT (Pistol Grip Tool) batteries 1008 & 1009 in the EV1 & EV2 PGTs, PGT battery 1004 in the spare PGT, HL (Helmet Light) 1015 & 1017 on EMU 3018, and HL 1019 & 1021 on EMU 3006.]*

The CDR also installed the METOX (Metal Oxide) CO_2 absorber canisters (in lieu of LiOH cans) in the suits, and checked out the EMUs and the SAFER (Simplified Aid for EVA Rescue) units

As part of his standard fitness evaluation, Malenchenko undertook the Russian MO-5 MedOps protocol of Cardiovascular Evaluation during Graded Exercises on the VELO cycle ergometer, with CDR Whitson assisting as CMO (Crew Medical Officer). *[The 50-min assessment, supported by ground specialist tagup via VHF and telemetry monitoring, uses the Gamma-1 ECG equipment with biomed harness, skin electrodes and a blood pressure and rheoplethysmograph cuff wired to the cycle ergometer's instrumentation panels. For the graded exercise, the subject works the pedals after a prescribed program at load settings of 125, 150, and 175 watts for three minutes each. Data output involves a kinetocardiogram, rheoplethysmogram, rheoencephalogram and a temporal pulsogram.]*

The FE-2 took air samples for the periodic (currently daily) atmospheric status check for ppO_2 (Partial Pressure Oxygen), using the hand-held CSA-O_2 (Compound Specific Analyzer-Oxygen) sensors that were readjusted on 1/22. Batteries were to be replaced if necessary. *[CSA- O_2s #1041 & #1052 were to be activated (if not already on) for taking readings in the Lab. Afterwards, both units were to be turned off and returned to their stowage. Purpose of the 15-min activity is to trend with MCA (Major Constituents Analyzer), i.e., to correlate the hand-held readings with MCA measurements, prior to US EVA-14 scheduled for next Wednesday. Daily CSA- O_2 readings will be compared to the MCA to ensure the hardware is operating to a known calibrated device. Two CSA- O_2s are required to support the Airlock campout for the upcoming US EVA-14.]*

At the HRF1 (Human Research Facility 1) rack, Tani deactivated the MedOps cardiac defibrillator and conducted its periodic checkout, which was to be recorded on video and later dumped to the ground (Last time done: 12/4/07). *[This routine maintenance task is scheduled as soon as possible from Expedition start and every 60 days thereafter. For the checkout, the defib is connected to the 120V outlet, equipped with its battery (today #1020) and then allowed to charge, for about five*

seconds, to a preset energy level (e.g., 100 joules). After the button-triggered discharge, a console indicator signals success or failure of the test. The pacing signal is downlinked via S-band for 1 min. The HRF was powered down afterwards.]

Dan completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

The FE-1 performed the daily 20-min. IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The FE-2 set up the video configuration for the upcoming weekend Robotics operations by putting in place the necessary cable hook-up of the UOP DCP (utility outlet panel/display & control panel) power bypass cable at the CUP RWS (Cupola Robotic Work Station).

The crewmembers performed their regular 2.5-hr physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Tani copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~9:25am EST, the CDR and FE-2 supported an interactive PAO interview with Cathi Erdman of the Chicago Daily Herald.

Robotics & SARJ Preview: Tomorrow, 1/25, the SSRMS (Space Station Remote Manipulator System), currently based on Node-2, will be "walked off" inchworm-style to the MT MBS (Mobile Transporter/Mobile Base System), detached from Node-2 and re-based on MBS PDGF-1 (Power & Data Grapple Fixture 1). On 1/26-27, the SSRMS will be maneuvered to the subsequently planned Stbd SARJ (Solar Alpha Rotary Joint) inspection via ground control. On Saturday, SSRMS will inspect the race ring's outer canted surface, while on Sunday the survey will focus on the Datum A surface. During each inspection, the SARJ will be rotated using 12 degree directed positioning moves every 5 minutes (requires 8 orbits for a full 360 degree inspection). Meanwhile, ground analysis of the root cause continues. Power analyses for upcoming missions are scheduled to be completed over the next month. SARJ cleaning and lubrication techniques are being evaluated. A

grease gun will be added to 1E manifest. ULF-2 manifest will likely have 12 TBAs (Trundle Bearing Assemblies) and 1 DLA (Drive Lock Assembly). Increment 18 and ULF-2 crew will receive training on outboard mode R&R and SARJ cleaning operations.

Progress 26P Reentry: On 1/22, 26P completed its deorbit burn and destructive reentry into the Earth's atmosphere. The 83.16 m/s deorbit burn began at approximately 2:06 pm EST and lasted for 2 minutes and 24 seconds. 26P undocked from the DC1 (Docking Compartment) nadir port on 12/21/07 to make room for 27P.

CEO (Crew Earth Observation) photo targets uplinked for today were **Canberra, Australia** *(weather was predicted to be mostly clear over the capital city of Australia. The nadir pass provided an opportunity to acquire a SW to NE transect across the metropolitan area. Nadir imagery of the rural-urban fringe transition zones is of particular interest),* **Sydney, Australia** *(shortly after leaving Canberra, ISS orbit track brought the crew over the most populous city in Australia - Sydney. Similarly to the Canberra target, a nadir image transect across the metropolitan area and into the harbor was requested),* and **Lake Eyre, Australia** *(looking to the right of track for Lake Eyre, a large and mostly dry lake bed in south-central Australia. General context views using the short lens were requested to capture the entire lake area. This will augment higher resolution images of the lake that the crew acquired earlier in this Expedition)*.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 8:21am EST [= epoch]):
Mean altitude -- 337.7 km
Apogee height -- 341.4 km
Perigee height -- 334.0 km
Period -- 91.29 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.000546
Solar Beta Angle -- 31.8 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 98 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52570

Significant Events Ahead *(all dates Eastern Standard, some changes possible. NET = Not Earlier Than):*

01/30/08 -- EVA-14 (BMRRM R&R, ~6 hrs)

01/31/08 -- **Explorer-1 50 Years (1st U.S. Satellite on Redstone rocket)** *[see http://usspace50.com & http://www.us50thspace.com*

02/04/08 -- Progress M-62/27P undocking (5:27am) & reentry

02/05/08 -- Progress M-63/28P launch (8:03am)

02/07/08 -- Progress M-63/28P docking (9:33am)

02/07/08 -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite. ~2:40pm EST

02/09/08 -- Progress M-

02/22/08 -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana)

03/06/08 -- ATV-1 Demo Day 1

03/11/08 -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS

03/12/08 -- ATV-1 Demo Day 2

03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)

04/07/08 -- Progress M-63/28P undocking (DC1) & reentry

04/08/08 -- Soyuz TMA-12/16S launch

04/10/08 -- Soyuz TMA-12/16S docking (DC1)

04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)

04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)

04/24/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS

04/26/08 -- STS-124/Discovery/1J docking

05/04/08 -- STS-124/Discovery/1J undocking

05/14/08 -- Progress M-64/29P launch

05/16/08 -- Progress M-64/29P docking (DC1)

08/07/08(NET) -- ATV-1 undocking (from SM aft port)

08/12/08 -- Progress M-65/30P launch

08/14/08 -- Progress M-65/30P docking (SM aft port)

09/09/08 -- Progress M-64/29P undocking (from DC1)

09/10/08 -- Progress M-66/31P launch

09/12/08 -- Progress M-66/31P docking (DC1)

09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC

09/20/08 -- STS-126/Discovery/ULF2 docking

10/01/08 -- STS-126/Discovery/ULF2 undocking.

10/01/08 -- **NASA 50 Years**

10/11/08 -- Progress M-65/30P undocking (from SM aft port)

10/12/08 -- Soyuz TMA-13/17S launch

10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)

10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)

11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)

11/06/08 -- STS-119/Discovery/15A launch – S6 truss segment

11/08/08 -- STS-119/Discovery/15A docking
11/17/08 -- STS-119/Discovery/15A undocking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/23/08
Date:	Wednesday, January 23, 2008 11:14:10 AM
Attachments:	

ISS On-Orbit Status 01/23/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Whitson & FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Peggy Whitson continued her work with the InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) experiment in the MSG (Microgravity Science Glovebox), today conducting runs #23 and #24, then powering down the payload and switching the MSG to standby. *[After activation of MSG plus InSPACE & InSPACE-2 equipment, Peggy checked on alignment & focusing of MSG video cam #2, repositioned the sample vial, changed out video recorder tapes and later deactivated InSPACE & MSG. InSPACE, conducted last in June 2006 by Jeff Williams on Increment 13, obtains basic data on magnetorheological fluids, i.e., a new class of "smart materials" that can be used to improve or develop new brake systems, seat suspensions robotics, clutches, airplane landing gear, and vibration damper systems. The dispersed particles are contained in CAs (Coil Assemblies) in the MSG that subject them to electric fields of certain strength and frequencies.]*

FE-1 Malenchenko supported TsUP-Moscow in the third of four days of ASN-M Satellite Navigation System testing. *[Today's activities by Yuri consisted in transferring raw ASN date from yesterday's ATV (Automated Transfer Vehicle) approach rehearsals from Laptop3 to PCMCIA memory card and setting it up for data downlinking to TsUP for*

analysis and determination how the test is proceeding. The purpose of the week long testing is to confirm ASN-M hardware readiness for the upcoming ATV "Jules Verne" vehicle docking.]

Dan Tani performed his daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 photo support). *[The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour.]*

Dan also relocated the IVCPDS/TEPC (Intravehicular Charged Particle Directional Spectrometer/Tissue Equivalent Proportional Counter), the primary radiation measurement tool in the ISS, from Node-2, where it was positioned on 12/24/07, to the Service Module (SM) on panel 410, plugging its power/data cable into the CHeCS (Crew Health Care Systems) outlet 1 on SM panel 210.

FE-1 Yuri Malenchenko underwent the periodic (generally monthly) health test with the cardiological experiment PZEh MO-1 ("Study of the Bioelectric Activity of the Heart at Rest") on the TVIS (Treadmill with Vibration Isolation System). *[During the 45-min. test, the FE-1 tagged up with ground specialists on a Russian ground site (RGS) pass via VHF and downlinked data from the Gamma-1M ECG (electrocardiograph) for about 5-6 minutes.]*

The FE-2 took air samples for the periodic (weekly) atmospheric status check for ppO_2 (Partial Pressure Oxygen), using the hand-held CSA-O_2 (Compound Specific Analyzer-Oxygen) sensors. Batteries were to be replaced if necessary. *[CSA-O2s #1041 & #1052 were to be activated (if not already on) for taking readings in the Lab. Afterwards, both units were to be turned off and returned to their stowage. Purpose of the 15-min activity is to trend with MCA (Major Constituents Analyzer), i. e., to correlate the hand-held readings with MCA measurements.]*

After printing out newly uplinked procedures for the US EVA-14 next week (1/30), the CDR & FE-2 conducted a two-hour review of the briefing package, covering topics like egress plan, timeline ordering of tasks, translation/fairleads/tether plan, hazards, and ingress plan. Later (~9:10am EST), Peggy and Dan tagged up with ground specialists to discuss particulars. Using the crew input, final procedures are now being prepared. *[The spacewalk of ~6 hrs duration has one major objective, broken into several steps: (1) Set up BMRMM (Bearing Motor Roll Ring Module, "broom") worksite; (2) Removed failed BMRRM (~35 min); (3) Install replacement BMRRM (~35 min); (4) Clean up worksite; and (5) Inspect STBD SARJ (Solar Alpha*

Rotary Joint).]

In the U.S. Airlock, Whitson initiated charging EMU (Extravehicular Mobility Unit) batteries in the BCA (Battery Charger Assembly).

Malenchenko again had several hours for cargo transfers from Progress M-62/27P to the ISS and stowing trash on the drone spacecraft for disposal (2/4), tracking movements in the IMS (Inventory Management System).

The FE-1 completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Yuri also conducted the daily 20-min. IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

With the Elektron-VM O_2 (oxygen) generator currently off, a 5-min cabin air refresh was to be performed by the CDR from Progress 27P storage (SrPK) as required.

Dr. Whitson broke out and set up the PFE-OUM (PFE-Oxygen Uptake Measurement) equipment on the HRF-2 (Human Research Facility 2) rack, including the HRF PFM/PAM (Pulmonary Function Module/Photoacoustic Analyzer Module), Mixing Bag System and GDS (Gas Delivery System). Data collection on herself and Dan, taking turns, is scheduled tomorrow. *[The Periodic Fitness Evaluation with Oxygen Uptake Measurement experiment, using the CEVIS ergometer for workout, demonstrates the capability of crewmembers to perform periodic fitness evaluations with continuous oxygen consumption measurements within 14 days after arrival on ISS, and once monthly during routine PFEs. Once the capability of the pulmonary function system (PFS) to perform PFEs is verified, crewmembers will be able to integrate their monthly PFE with oxygen consumption measurements to fulfill the requirement for cardiovascular fitness evaluations during long-duration space flight.]*

Working off his discretionary "time permitting" task list, Yuri performed the daily monitoring and picture-taking on the newly set up BIO-5 Rasteniya-2 ("Plants-2") experiment. *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording. During the duration of the BI O-5 experiment, students of*

the Moscow City Palace for Youth Creativity of the Meshchansky inter-regional center #15 in Moscow) and the Prince of Oldenburg Lyceum in St. Petersburg will be cultivating plants in parallel on the ground and conducting comparative observation of plant growth and development under gravity and zero-gravity conditions. They will be receiving photo images taken by Yuri.]

The crewmembers performed their regular 2.5-hr physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (FE-1), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Tani copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~11:25am EST, the CDR and FE-2 supported an interactive PAO interview with students, teachers, administrators and guests of Anderson Elementary School in Wichita, KS, gathered at the Exploration Place in Wichita.

At ~2:05pm, Dan is scheduled for his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-10 laptop).

Robotics Preview: On 1/25, the SSRMS (Space Station Remote Manipulator System), currently based on Node-2, will be “walked off” inchworm-style to the MT MBS (Mobile Transporter/Mobile Base System), detached from Node-2 and re-based on MBS PDGF-1 (Power & Data Grapple Fixture 1). On 1/26-27, the SSRMS will be maneuvered to the subsequently planned Stbd SARJ (Solar Alpha Rotary Joint) inspection.

CEO (Crew Earth Observation) photo targets uplinked for today were **Heard Island, S. Indian Ocean** *(a clear weather window is predicted to be present in the region of Heard Island at the time of the ISS pass. Looking to the right of track as the station approached Antarctica. Mapping photography of the island was requested to capture snow and ice extent),* **S. Georgia/S. Sandwich, S. Atlantic Ocean** *(weather was predicted to be clear over these South Atlantic islands during the ISS pass. Looking to the right of track for the islands. Mapping photography of snow and ice on the islands was requested. There may also have been sea ice visible to the S-SW of the island for photography, including a large iceberg [A53A]),* and **Patagonian Glaciers, S. America** *(ISS track provided a traverse across the northern portion of the Patagonian ranges. Overlapping, nadir mapping frames of summit glaciers and icefields, taken along track, were requested)*.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 8:00am EST [= epoch]):
Mean altitude -- 337.8 km
Apogee height -- 341.4 km
Perigee height -- 334.2 km
Period -- 91.29 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005405
Solar Beta Angle -- 30.6 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 107 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52554

Significant Events Ahead *(all dates Eastern Standard, some changes possible. NET = Not Earlier Than):*
01/30/08 -- EVA-14 (BMRRM R&R)
01/31/08 -- **Explorer-1 50 Years (1st U.S. Satellite on Redstone rocket)** *[see http://usspace50.com]*
02/04/08 -- Progress M-62/27P undocking (5:30am) & reentry
02/05/08 -- Progress M-63/28P launch (8:03am)
02/07/08 -- Progress M-63/28P docking (9:33am)
02/07/08(target date) -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite.02/09/08 -- Progress M-
02/22/08(NET) -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana)
03/06/08 -- ATV-1 Demo Day 1
03/12/08 -- ATV-1 Demo Day 2
03/13/08(target date) -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS

04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/06/08 -- STS-119/Discovery/15A launch – S6 truss segment
11/08/08 -- STS-119/Discovery/15A docking
11/17/08 -- STS-119/Discovery/15A undocking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/22/08
Date:	Tuesday, January 22, 2008 12:44:21 PM
Attachments:	

ISS On-Orbit Status 01/22/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Whitson & FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

At ~2:55am EST, the FE-2 again activated the VDS MPC (Video Distribution System/Multi-Purpose Converter) with its four downlinks to allow the ground to conduct HDTV (high-definition TV) playback and downlink operations. Later (~12:15pm), the MPC was powered off again. *[The end-to-end test of the system, conducted by the crew and ground specialists on 1/17 to verify the MPC HDTV (Multi-Purpose Converter/High-Definition TV) capability all the way to the NASA TV satellite, was very successful, yielding an overall end-to-end audio latency (delay) for the MPC System of 3.2 seconds. This is the delay from the crewmember to JSC/ MCC-H to NASA Headquarters and out to the NASA TV satellite in high definition (including, but are not limited to, CNNHD, ABC, NBC, CBS, and Discovery HD Theater), i.e. the sum total of the audio delay the interviewer and interviewee will "feel" during an interactive event. This Japan/JAXA originated system will be utilized soon for downlink messages and in-flight interviews based on client capability.]*

In Node-2, the CDR terminated the overnight leak check on the N_2 (nitrogen) recharge system. An overnight leak check of the ISS oxygen recharge line verifies the

integrity of the Node-2 N_2 recharge system installation. *[Node-2 N_2 recharge system fine leak check pass criteria requires real-time analysis to confirm that the N_2 supply pressure decay remains less than 124 kpa (18 psia) over 10 hours.]*

Using the SKDS CMS (Pressure Control & Atmosphere Monitoring System/ Countermeasure System), the FE-1 took the periodic readings of potentially harmful contaminants in the Service Module (SM). The hardware was then returned to initial stowage. *[The CMS uses preprogrammed microchips to measure Formaldehyde (H_2CO, methanal), Carbon Monoxide (CO) and Ammonia (NH_3), taking one measurement per microchip.]*

Dan Tani conducted the periodic checkout/verification of IP-1 airflow sensors in the various RS (Russian segment) hatch openings (8) in the SM (Service Module), FGB and DC1 (Docking Compartment).

Dan also terminated the depressurization of the PMA-2 (Pressurized Mating Adapter 2) in front of Node-2 with the depress pump set up yesterday after the successful completion of vestibule outfitting for the upcoming 1E Flight, and performed the standard ~1 hr leak check.

The CDR closed the Lab science window shutters as protection against today's planned thruster firings.

TsUP-Moscow conducted the second of four days of ASN-M Satellite Navigation System testing, with FE-1 support. *[Today's tests centered on an ISS attitude maneuver, controlled from the ground with ASN-M activated, with subsequent attitude hold, designed to rehearse for ATV (Automated Transfer Vehicle) approach. FE-1 transferred data from the ACH-M to the Russian laptop. For the Russian thruster firings, attitude control authority was handed over to Russian MCS (Motion Control System) at ~7:55am EST, to be returned to U.S. momentum management at ~3:20pm. The data will be downlinked tomorrow and Friday so that TsUP-Moscow can perform an analysis on the data and determine how the test is proceeding. The purpose of the week long testing is to confirm the ASN-M hardware readiness for the upcoming ATV "Jules Verne" vehicle docking.]*

Yuri completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

The FE-1 also conducted the daily 20-min. IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

In the SM, Yuri readied the newly installed Russian BIO-5 Rasteniya-2 ("Plants-2") experiment, planting its root module with pea seeds (6 seeds 1cm deep in each root module row), charging the water canister, loading new software and running a hardware test, then starting the experiment. *[Rasteniya-2, researches growth and development of plants (peas) under spaceflight conditions in the Lada-12 greenhouse from IBMP (Institute of Bio-Medical Problems, Russian: IMBP). During its operation, the experiment requires regular daily maintenance of the experiment involving monitoring of seedling growth, humidity measurements, moistening of the substrate if necessary, and photo/video recording.]*

With the Elektron-VM O_2 (oxygen) generator currently off, a 5-min cabin air refresh is to be performed by the FE-1 from Progress M-62/27P storage (SrPK) as required.

CDR Whitson continued her work with the MSG (Microgravity Science Glovebox) and the InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) experiment, today conducting runs #21 and #22, then powered down the payload and switched the MSG to standby. At her option, she may also continue with runs scheduled for tomorrow. *[After activation of MSG plus InSPACE & InSPACE-2 equipment, Peggy checked on alignment & focusing of MSG video cams, switched the magnetic field between runs, today, for #22, pulsing the field at 20 Hz (Hertz) instead of 2 Hz as she did previously. Peggy also repositioned the sample vial (VA-004) by 90 deg, used camera 2 & recorder 2 in the vial position 2 starting with run #19, changed out video recorder tapes and later deactivated InSPACE & MSG. InSPACE, conducted last in June 2006 by Jeff Williams on Increment 13, obtains basic data on magnetorheological fluids, i.e., a new class of "smart materials" that can be used to improve or develop new brake systems, seat suspensions robotics, clutches, airplane landing gear, and vibration damper systems. The dispersed particles are contained in CAs (Coil Assemblies) in the MSG that subject them to electric fields of certain strength and frequencies.]*

In the SM, Malenchenko initiated the JAXA-3DPC (Japan Aerospace Exploration Agency-3D Photon Crystals) crystal growth experiment. *[The purpose of this investigation is to grow photonic crystals in microgravity using particles in electrolytic solutions that will be fixed using ultraviolet light in a process referred to as photocuring, after self-organization and ordering of colloid nanoparticles in an electrolyte solution with subsequent fixation in an elastic gel matrix.]*

The CDR and FE-1 completed the mandatory monthly 30-min. CBT (computer-based training with video and audio) to refresh their CMO proficiency/rating. *[To maintain proficiency in using HMS (health maintenance systems) hardware including ACLS (advanced cardiac life support) in contingency situations where*

crew life is at risk, these training sessions are performed once a month to review equipment and procedures via CBT. Besides ACLS, procedures include airway obstruction management, i.e., review of suction device, nasal airway, intubating laryngeal mask airway (ILMA) with endotracheal tube, and cricothyrotomy (incision to re-enable breathing air inflow).]

Dan Tani performed his daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 photo support). *[The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour.]*

The two Flight Engineers worked in the Progress M-62/27P vehicle, dismantling the Kurs-A rendezvous & approach radar system of its motion control & navigation system (SUDN) and removing it from the logistics drone, a 3-hr. job. These valuable components, stowed in the FGB, will be returned to Earth on the Shuttle for reuse. *[KURS-A is the active half of the Russian space program's proven S-band radar system for automated flight, which measures relative motion parameters between Progress (or Soyuz) and the ISS during rendezvous operations, to enable the autopilot's calculation of corrective impulses. The system's passive transponder counterpart (KURS-P) is on the Service Module (SM), with one antenna each at the tip of the two solar array wings.]*

Whitson conducted the periodic (monthly) CSA-CP (Compound Specific Analyzer-Combustion Products) maintenance/checkout, today on all four units, then picked a new prime instrument and returned the backup units & sampling pump to their original locations. *[The CSA-CP is a passive cabin atmosphere monitor that provides quick response capability during a combustion event (fire). Its collected data are stored on a logger. Peggy changed out the batteries on the units, then zero-calibrated the instruments (to eliminate drift in the combustion sensors). Following zero calibration, the backup units was stowed in the Node (next to the sampling pump), while the prime unit's datalogger function was turned on to collect data at the SM Central Post as a spot check. After one hour, the datalogger was deactivated, with the prime CSA-CP remaining on for continuous passive sampling.]*

The CDR also was scheduled to conduct the periodic SM window inspection & photography, using a tool kit with ruler, adhesive tape, 90-deg equilateral triangle & measuring tape, the NIKON D2 X digital camera with 28-70 mm lens, a flash attachment, and sketches of the windows under scrutiny (##3,5,6,7,8) with previous detected flaws marked and flaw tables. *[Purpose of the activity is to assess the condition of the window panes for deterioration as compared to the data from*

previous increments (appearance of new cavities, scratches, discolorations, or spots reducing transparency, or an increase in the size of old flaws), plus photography.]

FE-1 Malenchenko used the Russian MO-21 “Ecosfera” air sampler & incubation equipment for another check on the station’s sanitary-hygiene status, conducting the standard 45-min. microbial analysis (T+7 days) on the air samples collected on 1/15 and incubated since then in the MO-21 equipment in Medium 2 (MON-2). *[MO-21 determines microbial contamination of the ISS atmosphere, specifically the total bacterial and fungal microflora counts and microflora composition according to morphologic criteria of microorganism colonies.]*

Whitson performed the regular monthly & quarterly maintenance of the TVIS (Treadmill with Vibration Isolation & Stabilization), inspecting the condition of harnesses, belt slats, corner bracket ropes, IRBAs (Isolation Restorative Bungee Assemblies) and gyroscope wire ropes for any damage or defects, lubricating as required plus recording time & date values.

A new addition to Peggy’s voluntary “job jar” task list was to continue the current round of periodic preventive maintenance of RS (Russian Segment) ventilation systems by cleaning the detachable VT7 fan screens 1, 2 & 3 of the three SOTR (Thermal Control System) gas-liquid heat exchangers (GZhT4) in the FGB.

The crewmembers performed their regular 2.5-hr physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-1, FE-2), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Peggy copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~5:30am, Yuri Malenchenko conducted a periodic private teleconference with his physical exercise specialist at TsUP.

Robotics Preview: On 1/25, the SSRMS (Space Station Remote Manipulator System), currently based on Node-2, will be “walked off” inchworm-style to the MT MBS (Mobile Transporter/Mobile Base System), detached from Node-2 and re-based on MBS PDGF-1 (Power & Data Grapple Fixture 1). On 1/26-27, the SSRMS will be maneuvered to the subsequently planned Stbd SARJ (Solar Alpha Rotary Joint) inspection.

No CEO photo targets uplinked for today. *[Due to the Martin Luther King Jr. Federal Holiday yesterday, the next CEO observations will be conducted tomorrow (targets uplinked today).]*

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 7:45am EST [= epoch]):
Mean altitude -- 337.9 km
Apogee height -- 341.5 km
Perigee height -- 334.3 km
Period -- 91.29 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.000538
Solar Beta Angle -- 28.8 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 105 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52538

Significant Events Ahead *(all dates Eastern Standard, some changes possible. NET = Not Earlier Than):*
01/30/08 -- EVA-14 (BMRRM R&R)
01/31/08 -- **Explorer-1 50 Years (1st U.S. Satellite on Redstone rocket)** *[see http://usspace50.com]*
02/04/08 -- Progress M-62/27P undocking (5:30am) & reentry
02/05/08 -- Progress M-63/28P launch (8:03am)
02/07/08 -- Progress M-63/28P docking (9:33am)
02/07/08(target date) -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite.02/09/08 -- Progress M-
02/22/08(NET) -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana)
03/06/08 -- ATV-1 Demo Day 1
03/12/08 -- ATV-1 Demo Day 2
03/13/08(target date) -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)

04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/06/08 -- STS-119/Discovery/15A launch – S6 truss segment
11/08/08 -- STS-119/Discovery/15A docking
11/17/08 -- STS-119/Discovery/15A undocking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
04/15/09 -- **Constellation’s Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/21/08
Date:	Monday, January 21, 2008 12:10:46 PM
Attachments:	

ISS On-Orbit Status 01/21/08

All ISS systems continue to function nominally, except those noted previously or below. *Martin Luther King Jr. Federal Holiday. Underway: Week 14 of Increment 16.*

CDR Whitson & FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

FE-1 Malenchenko supported the begin of the scheduled end-to-end ASN-M Satellite Navigation System test, today installing Laptop3, connecting it to the MKO-1 (Multiplex Exchange Channel), then initializing it with its specialized software. *[ASN-M is required for the arrival of the European ATV (Automated Transfer Vehicle) "Jules Verne" later this year.]*

Peggy Whitson prepared PMA-2 (Pressurized Mating Adapter 2), where STS-122/1E will dock next month, for interim ingress, first pressurizing it, then opening the Node-2 forward hatch, removing the hatch thermal cover and the CBCS (Centerline Berthing Camera System) target, then installing the HHGA (Hatch Handle Guide Ring.

With PMA-2 pressurized, Whitson ingressed the adapter from Node-2, configured its outward vestibule for the docking with STS-122/1E and closed out the radial port in the Node-2/PMA-2 vestibule. Later, after egress, Tani evacuated the PMA-2 with the depress pump and stowed the VAJ (Vacuum Access Jumper) equipment.

While in Node-2, the CDR performed a purge and leak check on the N_2 (nitrogen) recharge system.

After setting up the hardware, Yuri Malenchenko conducted a run with the Russian MBI-21 PNEVMOKARD experiment, his third on-orbit session (which forbids moving or talking during data recording). The experiment is controlled from the RSE-Med A31p laptop, equipped with new software, and uses the TENZOPLUS sphygmomanometer to measure arterial blood pressure. *[PNEVMOKARD (Pneumocard) is an attempt to obtain new scientific information to refine the understanding about the mechanisms used by the cardiorespiratory system and the whole body organism to spaceflight conditions. By recording (on PCMCIA cards) the crewmember's electrocardiogram, impedance cardiogram, low-frequency phonocardiogram (seismocardiogram), pneumotachogram (using nose temperature sensors), and finger photoplethismogram, the experiment supports integrated studies of (1) the cardiovascular system and its adaptation mechanisms in various phases of a long-duration mission, (2) the synchronization of heart activity and breathing factors, as well as the cardiorespiratory system control processes based on the variability rate of physiological parameters, and (3) the interconnection between the cardiorespiratory system during a long-duration mission and the tolerance of orthostatic & physical activities at the beginning of readaptation for predicting possible reactions of the crewmembers organism during the their return to ground.]*

In preparation of the upcoming EVA-14 (1/30), the FE-1 recorded the "Pille" radiation readings from the EMU-worn (plus one background) "Pille-MKS" dosimeters in a log table for subsequent downlink to the ground.

With the Elektron-VM O_2 (oxygen) generator currently off, a 5-min cabin air refresh is to be performed by the FE-1 from Progress M-62/27P storage (SrPK) as required.

Malenchenko also outfitted the FGB with a new hatch seal drive handle which he transferred from the SSVP (Docking & Internal Transfer System) accessory kit of Soyuz TMA-11/15S to the FGB's SSVP kit. The old handle was returned from the FGB kit to the Soyuz to be used in final Soyuz SU (Descent Capsule)/BO (Orbital compartment) hatch closures and subsequent disposal in the BO.

In the Service Module (SM), Yuri installed a new atmosphere purification filter (A2).

The FE-1 also performed monthly maintenance on the Russian IK0501 GA (gas analyzer) of the SOGS Pressure Control & Atmospheric Monitoring System, deactivating the unit and replacing its CO_2 filter assembly (BF) with a new unit from FGB stowage (replaced last: 12/9). *[After ensuring good seals on the instrument's*

base and no leaks around the installed filter, Yuri reactivated the GA and stowed the spent BF for disposal. IK0501 is an automated system for measuring CO_2*,* O_2*, and* H_2O *in the air as well as the flow rate of the gas being analyzed.]*

Yuri completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Working off his discretionary "time permitting" task list, the FE-1 conducted the daily 20-min. IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crewmembers performed their regular 2.5-hr physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (FE-1), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Peggy copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Starting a new current round of periodic preventive maintenance of ventilation systems in the RS (Russian Segment), FE-2 Tani worked in the DC1 (Docking Compartment) to replace the PF1,2 filter cartridges and clean the V1 & V2 fan grilles and VD1 & VD2 air ducts.

The CDR ran the periodic check of active U.S. payloads, i.e., cleaning the ANITA (Analyzing Interferometer for Ambient Air) inlet plus inspecting and filter cleaning of the CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) incubator payload. *[The CGBA incubator is controlled from the ground, with automatic video downlinked to Earth. ANITA continues to collect data every six seconds and downlinks the data daily to the ground team. ANITA monitors low levels of potential gaseous contaminants in the ISS cabin atmosphere with a capability of simultaneously monitoring 32 gaseous contaminants. The experiment is testing the accuracy and reliability of this technology as a potential next-generation atmosphere trace-gas monitoring system for ISS and future spacecraft. This is a cooperative investigation with ESA.]*

Peggy also prepared for tomorrow's scheduled SM window inspection & photography by unstowing a tool kit with ruler, adhesive tape, 90-deg equilateral

triangle & measuring tape, the NIKON D2 X digital camera with 28-70 mm lens, a flash attachment, and sketches of the windows under scrutiny (##3,5,6,7,8) with previous detected flaws marked and flaw tables. *[Purpose of the activity is to assess the condition of the window panes for deterioration as compared to the data from previous increments (appearance of new cavities, scratches, discolorations, or spots reducing transparency, or an increase in the size of old flaws), plus photography.]*

Tani performed his daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 photo support). *[The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour.]*

The crewmembers conducted their regular 2.5-hr physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Peggy Whitson copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Conjunction Update: Further tracking of the piece of orbital debris (Object #28099, an old Russian Strela ICBM body, NATO designation: SS-11 Sego) moved the closest approach out of the Notification Box into the “Green”, with a Pc (Probability of Collision) going below 10ex-17 (10 to the power of -17). Russian Ballistics stood down on any maneuver planned for Saturday morning (their time).

No CEO photo targets uplinked for today. *[Due to the Martin Luther King Jr. Federal Holiday tomorrow (1/21), the next CEO observations will be conducted on 1/23 (targets uplinked 1/22).]*

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this “Gateway” site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 8:51am EST [= epoch]):
Mean altitude -- 338.0 km
Apogee height -- 341.7 km
Perigee height -- 334.4 km
Period -- 91.29 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005428
Solar Beta Angle -- 26.5 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 115 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52523

Significant Events Ahead *(all dates Eastern Standard, some changes possible. NET = Not Earlier Than):*
01/30/08 -- EVA-14 (BMRRM R&R)
01/31/08 -- **Explorer-1 50 Years (1st U.S. Satellite on Redstone rocket)** *[see http://usspace50.com]*
02/04/08 -- Progress M-62/27P undocking (5:30am) & reentry
02/05/08 -- Progress M-63/28P launch (8:03am)
02/07/08 -- Progress M-63/28P docking (9:33am)
02/07/08(target date) -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite.02/09/08 -- Progress M-
02/22/08(NET) -- ATV-1 “Jules Verne” launch/Ariane V (Kourou, French Guyana)
03/06/08 -- ATV-1 Demo Day 1
03/12/08 -- ATV-1 Demo Day 2
03/13/08(target date) -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)

09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/06/08 -- STS-119/Discovery/15A launch – S6 truss segment
11/08/08 -- STS-119/Discovery/15A docking
11/17/08 -- STS-119/Discovery/15A undocking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/20/08
Date:	Sunday, January 20, 2008 3:39:05 PM
Attachments:	

ISS On-Orbit Status 01/20/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday -- off-duty day for CDR Whitson, FE-1 Malenchenko and FE-2 Tani. Ahead: Week 14 of Increment 16.*

For today's VolSci (Voluntary Weekend Science) program, CDR Whitson continued her work with the MSG (Microgravity Science Glovebox) and the InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) experiment, today conducting runs #18, #19, and #20, then powered down the payload and switched the MSG to standby. *[After activation of MSG plus InSPACE & InSPACE-2 equipment, Peggy checked on alignment & focusing of MSG video cams, switched the magnetic field between runs, today pulsing the field at 2 Hz (Hertz) instead of 20 Hz as she did previously. Peggy also repositioned the sample vial (VA-004) by 90 deg, used camera 2 & recorder 2 in the vial position 2 starting with run #19, changed out video recorder tapes and later deactivated InSPACE & MSG. InSPACE, conducted last in June 2006 by Jeff Williams on Increment 13, obtains basic data on magnetorheological fluids, i.e., a new class of "smart materials" that can be used to improve or develop new brake systems, seat suspensions robotics, clutches, airplane landing gear, and vibration damper systems. The dispersed particles are contained in CAs (Coil Assemblies) in the MSG that subject them to electric fields of certain strength and frequencies.]*

FE-2 Dan Tani completed his daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 photo support). *[The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour.]*

FE-1 Malenchenko conducted today's routine maintenance of the SOZh system

(Environment Control & Life Support System, ECLSS) in the Service Module (SM), including ASU toilet facilities systems/replaceables, the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP.

The crewmembers performed their regular 2.5-hr physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

At ~9:30am EST, Yuri had his PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-10 laptop).

At ~2:22pm, Dan had his PFC.

With the Elektron-VM O_2 (oxygen) generator currently off, a 5-min cabin air refresh is to be performed by the FE-1 (off his voluntary task list) from Progress M-62/27P storage (SrPK) as required.

MPC HDTV Update: Dan Tani was lauded by the ground for his great work on 1/17 verifying the MPC HDTV (Multi-Purpose Converter/High-Definition TV) capability all the way to the NASA TV satellite. The test was very successful, yielding an overall end-to-end audio latency (delay) for the MPC System of 3.2 seconds. This is the delay from the crewmember to JSC/MCC-H to NASA Headquarters and out to the NASA TV satellite in high definition, i.e. the sum total of the audio delay the interviewer and interviewee will "feel" during an interactive event. This Japan/JAXA originated system will be utilized soon for downlink messages and in-flight interviews based on client capability.

No CEO photo targets uplinked for today. *[Due to the Martin Luther King Federal Holiday tomorrow (1/21), the next CEO observations will be conducted on 1/23 (targets uplinked 1/22).]*

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this “Gateway” site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 8:37am EST [= epoch]):
Mean altitude -- 338.1 km

Apogee height -- 341.8 km
Perigee height -- 334.5 km
Period -- 91.30 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005434
Solar Beta Angle -- 23.8 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 132 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52507

Significant Events Ahead *(all dates Eastern Standard, some changes possible. NET = Not Earlier Than):*
01/30/08 -- EVA-14 (BMRRM R&R)
01/31/08 -- **Explorer-1 50 Years (1st U.S. Satellite on Redstone rocket)** *[see http://usspace50.com]*
02/04/08 -- Progress M-62/27P undocking (5:30am) & reentry
02/05/08 -- Progress M-63/28P launch (8:03am)
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02/07/08(target date) -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite.02/09/08 -- Progress M-
02/22/08(NET) -- ATV-1 “Jules Verne” launch/Ariane V (Kourou, French Guyana)
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09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC

09/20/08 -- STS-126/Discovery/ULF2 docking
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/19/08
Date:	Saturday, January 19, 2008 3:54:22 PM
Attachments:	

ISS On-Orbit Status 01/19/08

All ISS systems continue to function nominally, except those noted previously or below. *Saturday -- off-duty day for CDR Whitson, FE-1 Malenchenko and FE-2 Tani except for housekeeping and voluntary work.*

CDR Whitson & FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Peggy and Dan performed their part of the regular weekly station cleaning (Yuri having done his share yesterday). *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the Service Module (SM) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the CDR's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

Tani also performed his daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 photo support). *[The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour.]*

At ~9:05am EST, the crewmembers held their regular weekly planning conference (WPC) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP/Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

Later, Yuri completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including ASU toilet facilities systems/replaceables.

The crewmembers performed their regular 2.5-hr physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Peggy Whitson copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Yuri again had some time for transferring cargo delivered on Progress M-62/27P to the ISS and stowing it.

Conjunction Advisory: MCC-Houston ballistics specialists are monitoring a conjunction with orbital debris (Object #28099, an old Russian Strela ICBM body, NATO designation: SS-11 Sego), with TCA (time of closest approach) tomorrow morning at ~10:36am EST. Current predictions (Update #8) show a miss distance of ~20.6 km, which falls within the Notification Box according to Flight Rule (B4-101). Russian Ballistics has been notified. Prime DAM TIG (Debris Avoidance Maneuver Time of Ignition), based on current prediction, will be tomorrow morning at 8:18am EST for a TCA of 10:36am.

Weekly Science Update (Expedition Sixteen -- Week 13)

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): ALTEINO instrument has been rotated by the crew on 1/8 and memory card has been exchanged. Photos of the new configuration have been taken and placed on OCA for down-link. On 1/9 data has been downlinked and unexpected file size has been reported (partial recording). Analysis from the pictures showed that the grounding strap of the ALTEINO instrument got loose, leading to incorrect behavior of the instrument. After TsUP-Moscow request, the grounding cable has been fastened again and ALTEINO re-activated on 1/15.

ANITA: Completed.

BCAT-3 (Binary Colloidal Alloy Test 3): "Here is our re-cap from last Monday's (1/14) ops to photo all samples then run sample 4. Seeing all the samples was very interesting and spurred the planned 1/24 sample 5 ops. We thank those involved in keeping EarthKAM going for BCAT!! Samples 1, 2, 3 and 6 all follow the same phase-separation sequence (as in the sample 3 movie he sent along), yet samples 4 and 5 are different and hence even more interesting. A scientific publication describing these findings is being prepared."

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): "Dan, we are waiting to get the new launch date so we can schedule your second in-flight session to meet the R-21 to R-14 requirement. This activity will be hard scheduled when we get a firm launch date."

CFE (Capillary Flow Experiment): Reserve.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): In progress.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): In progress.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): "InSPACE-2 completed its nominal science this week and initiated an additional set of runs to further investigate pulsed-field structures at a lower pulse frequency. The fourth and highest concentration sample was successfully tested to conclude the nominal science. In total 17 runs have been completed. Our early observation of the video of the nominal science indicates that the chain structures aggregate laterally into a formation of thicker chains and voids, with a characteristic separation wavelength which depends on field strength and

volume fraction. The chain aggregates are columns spanning the length of the cell, as opposed to ellipsoidal structures observed on the ground. The additional science runs provided the first glimpse of ellipsoidal structures with sharp pointed ends. A very interesting pulse behavior of the structures was observed. The aggregate structures pulsed lengthwise with the magnetic field and pulsed laterally in a wavy pattern was fascinating to watch."

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Complete.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 "Pirs".

MULTIGEN-1: MULTIGEN-1 samples will be downloaded on STS-122 (1E).

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION/REPOSITORY: " Dan, thank you for your voluntary participation in a stand-alone Repository session. Your attention in keeping to the time constraints was much appreciated!"

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): "Peggy & Dan, we have added an Actiwatch download/initialization activity to the task list. The Actiwatches will stop taking data on 1/26 if not performed before then."

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): In progress.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

CEO (Crew Earth Observation): Through 1/15 the ground has received a total of 10,857 frames of ISS/CEO imagery for review and cataloging. "We have identified and are evaluating excellent imagery of our requests for: South Georgia Island; Gulf of Fonseca; and Perth, Australia (some of the best we've ever seen). We have also noted with delight your excellent imagery of cities at night. PAO is using one of your Dallas-Fort Worth, TX views. Your dramatic, oblique view of the Great Sand Dunes National Park and Preserve, CO will be published on NASA/GSFC's Earth Observatory website this weekend. Your view beautifully captures the context and extent of this spectacular dune field banked against the Sangre de Cristo Mountains. What a nice catch! Thanks for your fine work."

CEO photo targets uplinked for today were Patagonian Glaciers, S. America (ISS orbit track brought the crew over the central Patagonian mountains. Looking to the left of track as the station passed over the mountains for glaciers and icefields near the summit ridgelines), and Jarvis Island, equatorial Pacific (weather was predicted to be clear over Jarvis Island, which is located roughly halfway between the Hawaiian and Cook Islands. Jarvis is an uninhabited coral island, but during the 19th century it was a mining location for bird guano. The island is now a U.S. National Wildlife Refuge [for seabirds, shorebirds, and marine fauna]. Looking slightly to the left of track for the island.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 8:15am EST [= epoch]):
Mean altitude -- 338.3 km
Apogee height -- 341.9 km
Perigee height -- 334.6 km
Period -- 91.30 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005486
Solar Beta Angle -- 20.8 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 124 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52491

Significant Events Ahead *(all dates Eastern Standard, some changes possible. NET = Not Earlier Than):*
01/30/08 -- EVA-14 (BMRRM R&R)
01/31/08 -- **Explorer-1 50 Years (1st U.S. Satellite on Redstone rocket)** *[see http://usspace50.com]*
02/04/08 -- Progress M-62/27P undocking (5:30am) & reentry
02/05/08 -- Progress M-63/28P launch (8:03am)
02/07/08 -- Progress M-63/28P docking (9:33am)
02/07/08(target date) -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite.02/09/08 -- Progress M-
02/22/08(NET) -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana)
03/06/08 -- ATV-1 Demo Day 1
03/12/08 -- ATV-1 Demo Day 2
03/13/08(target date) -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/06/08 -- STS-119/Discovery/15A launch – S6 truss segment
11/08/08 -- STS-119/Discovery/15A docking

11/17/08 -- STS-119/Discovery/15A undocking
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04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/18/08
Date:	Friday, January 18, 2008 12:57:29 PM
Attachments:	

ISS On-Orbit Status 01/18/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Whitson & FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Also before breakfast, Peggy Whitson, Yuri Malenchenko and Dan Tani performed the periodic Russian biomedical routine assessments PZEh-MO-7/Calf Volume Measurement and PZEh-MO-8/Body Mass Measurement (6th for CDR & FE-1, 5th for FE-2), using the IM mass measurement device which Malenchenko afterwards broke down for stowage. *[Calf measurements (left leg only) are taken with the IZOG device, a custom-sewn fabric cuff that fits over the calf, using the knee and lower foot as fixed reference pints, to provide a rough index of deconditioning in zero-G and effectiveness of countermeasures. For determining body mass in zero-G, where things are weightless but not massless, the Russian IM "scales" measure the inertial forces that arise during the oscillatory motion of a mass driven by two helical metering springs with known spring constants. By measuring the time period of each oscillation of the unknown mass (the crewmember) and comparing it to the period of a known mass, the crewmember's mass is calculated by the computer and displayed.]*

At ~3:55am EST, the FE-2 again activated the VDS MPC (Video Distribution System/Multi-Purpose Converter) with its four downlinks to allow the ground to

conduct HDTV (high-definition TV) playback and downlink operations. Later (~1:05pm), the MPC was powered off again. *[The end-to-end test of the system, conducted by the crew and ground specialists on 1/17 from the ISS though the NASA DTV system using the MPC to determine signal latency was a full success. Final results for latency measurements should be available early next week, although the current estimate in the delay was approximately 3 seconds. This capability will allow High Definition (HD) TV transmission to NASA Headquarters which can then broadcast to network HD channels. Networks that could potentially take advantage of this opportunity include, but are not limited to, CNNHD, ABC, NBC, CBS, and Discovery HD Theater. The MPC Project is a joint SDTO between JAXA and NASA to downlink HDTV from the ISS.]*

Dan Tani performed his daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 photo support). *[The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour.]*

FE-1 Malenchenko conducted the regular weekly station cleaning in the Russian segment (RS). *[“Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the Service Module (SM) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the CDR's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises.]*

CDR Whitson removed and replaced two RPCMs (Remote Power Controller Modules) in the Lab. *[The R&R of RPCMs LA1B-H & LA1B_C was complicated by the fact that the TeSS rack in the Lab had to be removed to access the work site, as well as the fact that significant power-downs were required to safe the RPCMs for removal.]*

Thus, preparatory to the RPCM IFM (Inflight Maintenance), Whitson and Tani removed the TeSS (Temporary Sleep Station) rack to gain access behind it in the Lab endcone for the subsequent RPCM removal & replacements (R&Rs). Later, Peggy and Dan restored the TeSS to its normal position.

The CDR took off the PPRV (Positive Pressure Relief Valve) cap in the Node 2 starboard hatch; she later reinstalled it on the PPRV.

Before the R&Rs, the FE-2 also turned off the loads (equipment) powered by UOP-

6 (Utility Outlet Panel 6) in the Lab, which included the SSC-4 (Station Support Computer 4), SSC-7, and MEC (Medical Equipment Computer). After the RPCM R&Rs, UOP-6 loads were powered on again, and SSC-4 was logged in to launch the KFX (Ku Band File Transfer) application, which it supports.

Prior to the scheduled installation of the BUAP (Antenna Switching Control Box) gear of the ATV PCE (Automated Transfer Vehicle/Proximity Communications Equipment; Russian: MBRL), FE-1 Malenchenko and TsUP specialists performed a planned deactivation of the Elektron. As part of the deactivation process the Elektron was purged with N_2 (nitrogen), controlled from laptop.

Afterwards, Yuri had several hours set aside for the installation and checkout of the BUAP (which will switch between the external PCE antennas), followed by its connection to the BITS2-12 Onboard Telemetry Measurement System. The installation was tested by checking the AFU (Antenna Feeder Unit) circuit lines and connections for continuity and RF (radio frequency) performance with a "Standing Wave Coefficient" (KSV) test using an FSH3 spectrum analyzer from the GTS (Global Timing System). The FHS3 measurements were then transferred to the TP2 laptop and prepared for downlink to the ground. *[The PCE/MBRL components for ATV prox ops are the space-to-space radio "monoblock" (PCE Z0000), the BUAP, and the ATV control panel (PU). A full-scale test of the PCE with all antennas is scheduled for later this month.]*

The two flight engineers had again time reserved for cargo transfers and stowage from Progress M-62/27P.

Dan also filled out the regular FFQ (Food Frequency Questionnaire), his 10th, on the MEC. *[By means of these FFQs, U.S. astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins.]*

Peggy took air samples for the periodic (weekly) atmospheric status check for ppO_2 (Partial Pressure Oxygen) and $ppCO_2$ (pp Carbon Dioxide), using the hand-held CSA-CP (Compound Specific Analyzer-Combustion Products), CSA-O_2 (CSA - Oxygen sensor) and CDMK (CO_2 Monitoring Kit). Batteries were to be replaced if necessary. *[Purpose of the 15-min activity is to trend with MCA (Major Constituents Analyzer), i.e., to correlate the hand-held readings with MCA measurements.]*

Yuri completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including ASU toilet facilities systems/replaceables.

The crewmembers performed their regular 2.5-hr physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Dan Tani copied the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Working off his discretionary "time permitting" task list, the FE-1 conducted the daily 20-min. IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

At ~2:15am EST, the CDR had her weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-10 laptop).

At ~3:20am, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~3:55am, Yuri linked up with TsUP stowage specialists via S-band to conduct the weekly IMS tagup, discussing stowage issues and equipment locations.

At ~12:45pm, the crew will conduct the periodic science/research conference with Science Program representatives at MCC-H. *[In terms of accomplishments, of the originally (at beginning of Increment) planned 92 hours plus 194 hours of reserve not planned/scheduled, all planned and reserve activities have been completed (except those that need to be done post-1E). Replanning is in work for additional research through 1E, including InSPACE, SPHERES, LOCAD, SWAB, SLAMM-D, NUTRITION & Repository, and newly designed EPO Demos. New activities coming up with STS-122/1E are GEOFLOW and WAICO.]*

At ~2:20pm, the crew is scheduled for their ninth weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC-10 (Station Support Computer 10)]*.

CEO photo targets uplinked for today were *Antarctic Ice Pack, S. Atlantic Ocean (storm systems are moving through the South Atlantic, but significant holes in the cloud deck can be expected. Icebergs may be visible through these holes. The larger ice fragments are monitored as potential hazards to ships and as part of International Polar Year research. Looking to the right of track as ISS approached Antarctica for opportunities to view the sea surface),* and **Patagonian Glaciers, S. America** *(ISS orbit track traversed the northern Patagonian mountains from NW to SE. Nadir overlapping frames, taken along track, of glaciers and icefields on the mountain flanks and summits were requested for time-series analysis of ice extent and morphology change)*.

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http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 7:52am EST [= epoch]):
Mean altitude -- 338.4 km
Apogee height -- 342.0 km
Perigee height -- 334.7 km
Period -- 91.30 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005464
Solar Beta Angle -- 17.4 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 124 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52475

Significant Events Ahead *(all dates Eastern Standard, some changes possible. NET = Not Earlier Than):*
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01/31/08 -- **Explorer-1 50 Years (1st U.S. Satellite on Redstone rocket)** *[see http://usspace50.com]*
02/04/08 -- Progress M-62/27P undocking (5:30am) & reentry
02/05/08 -- Progress M-63/28P launch (8:03am)
02/07/08 -- Progress M-63/28P docking (9:33am)
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02/22/08(NET) -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana)
03/06/08 -- ATV-1 Demo Day 1

03/12/08 -- ATV-1 Demo Day 2
03/13/08(target date) -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/17/08
Date:	Thursday, January 17, 2008 6:57:28 PM
Attachments:	

ISS On-Orbit Status 01/17/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Whitson & FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Preparatory to today's pump R&R (Removal & Replacement) of the EHS VOA (Environmental Health Systems/Volatile Organic Analyzer), CDR Whitson rotated the CHeCS rack down for some AAA (Avionics Air Assembly) fan/filter and smoke detector cleaning, before FE-2 Tani performed the VOA IFM (Inflight Maintenance), with filter inspection, preceded and followed by taking CSA-O_2 (Compound Specific Analyzer-Oxygen) readings in the affected rack areas. *[If the O_2 percentage was between 15.7% - 24.1%, Dan was Go to proceed. If not, the ground had steps to be taken to ventilate the area. Ground analysis has shown that the secondary seals in QDs (Quick Disconnects) in the Nitrogen/Oxygen systems do not always seal properly, which can result in an increased N_2/O_2 concentration behind panels & racks with no ventilation. The CHeCS (LAB1D4) is one of these racks.]*

FE-1 Malenchenko set up the equipment for his first session with the Russian experiment DYKHANIE ("respiration", "breathing"), tagged up with ground specialists and conducted the session, later closing down and stowing the equipment. *[Dykhanie-1 gear uses two belts (PG-T/thoracic, PG-A/abdominal), a calibrator, resistor, mouthpiece, etc., to study fundamental physiological*

mechanisms of the external breathing function of crewmembers under long-duration orbital flight conditions. During the experiment, physiological measurements are taken and recorded with a pneumotachogram, a thoracic pneumogram, an abdominal pneumogram, and pressure data in the oral cavity. All experimentally derived plus salient environmental data along with personal data of the subject are recorded on PCMIA card for return to the ground at end of the Expedition. Objectives include determining the dynamics of the relationship between thoracic (pectoral) and abdominal breathing function reserves and their realization potential during spontaneous breathing, the coordinated spontaneous respiratory movements in terms of thoracic and abdominal components of volumetric, time & rate parameters of spontaneous respiratory cycle, identification of the features of humoral-reflex regulation of breathing by dynamics of ventilation sensitivity of thoracic and abdominal components to chemoreceptor stimuli, etc. Overall, the experiment is intended to provide a better understanding of the basic mechanisms of pulmonary respiration/gas exchange gravitational relations of cosmonauts.]

Using the Russian MO-21 "Ecosfera" air sampler & incubation equipment, the FE-1 monitored the station's sanitary-hygiene status by conducting another 40-min. microbial analysis (T+2 days) on the air samples collected on 1/15 and incubated since then in the MO-21 equipment. *[MO-21 determines microbial contamination of the ISS atmosphere, specifically the total bacterial and fungal microflora counts and microflora composition according to morphologic criteria of microorganism colonies. The equipment, consisting of an air sampler set, a charger and power supply unit, provides samples to help determine microbial contamination of the ISS atmosphere, specifically the total bacterial and fungal microflora counts and microflora composition according to morphologic criteria of microorganism colonies.]*

Supported by ground specialists via tagup, Malenchenko also unloaded new equipment for the BIO-5 RASTENIYA-2 ("Plants-2") micro-G growth payload from Progress 27P and installed the new payload in the Service Module (SM) near the LADA-12 greenhouse, then reinstalled software, refilled the water canister and checked the hardware out. *[The payload hardware includes a module (MIS/Module for the Investigation of Substrates), a MIS control unit (BU), a nitrogen purge unit (BPA) and other accessories. Rasteniya researches growth and development of plants under spaceflight conditions in the LADA-12 greenhouse.]*

At ~7:05am EST, Whitson and Tani conducted another teleconference with EVA specialists to discuss updated instructional material for the R&R of the failed BGA 1A BMRRM (Beta Gimbal Angle 1A Bearing Motor Roll Ring Module) during EVA-14 on 1/30. In preparation for the EVA, engineers are planning to conduct an illumination test on SAW (Solar Array Wing) 3A to characterize incidental illumination of a solar array during solar eclipse (Earth shadow period).

Peggy Whitson conducted the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week (currently #16-0018N).]*

The crew performed the mandatory 90-min OBT (onboard training) emergency egress drill for the case of rapid cabin depressurization, with Russian and US specialists standing by at both control centers for crew questions or comments. During the drill, the crewmembers proceeded through a prescribed series of timed station checkpoints, determining and verifying valve settings, instruments measurements, hatch configurations, etc. A 20-min joint drill debrief via S-band to the ground concluded the exercise, led by TsUP/Moscow. *[Background: Purpose of the drill is to practice (a) crew response procedures in the event of ISS depress, (b) communication and coordination between crew and the ground in such an emergency, and (c) communication and coordination among crew members themselves. In the RS, the crew translated along the emergency egress path to the FGB nadir port (where Soyuz 15S is currently docked), stepped through the process of preparing Progress 27P at the DC1 for undocking, etc. Soyuz and ISS communications were restored to nominal stage ops after the exercise.]*

Yuri Malenchenko conducted a search, gather and setup operation of equipment for new ATV PCE (Automated Transfer Vehicle/Proximity Communications Equipment; Russian: MBRL) tests scheduled tomorrow, requiring the BUAP antenna switching control box for the "Standing Wave Coefficient" (KSV) test using the FSH3 spectrum analyzer from the GTS (Global Timing System).

More troubleshooting on the recently (1/4) failed GTS was listed today on Malenchenko's voluntary, "time permitting" task list.

In the Soyuz 15S spacecraft, docked at the FGB nadir port, Malenchenko turned off the gas analyzer, terminating its periodic checkup activity.

Dan Tani performed his daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 photo support). *[The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour.]*

Malenchenko completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Working off his discretionary job list, Malenchenko also conducted the daily 20-min. IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/ import to its three databases on the ground (Houston, Moscow, Baikonur).

On the TVIS (Treadmill with Vibration Isolation & Stabilization), Dan tested the roll-stabilizing gyro's Off command for proper function.

The crewmembers performed their regular 2.5-hr physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2) , TVIS treadmill (FE-1), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Dan Tani copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

After Houston Flight Controllers started deactivating the CDRA (Carbon Dioxide Removal Assembly) early this morning (5:00-10:00am) and cooling was no longer required, the CDR disconnected the ITCS LTL QD (Internal Thermal Control System/Low Temperature Loop/Quick Disconnect) jumper to the CDRA rack (LAB1D6).

Using the MPC (Multi-Protocol Converter) for downlink, the crew at ~12:15pm transmitted onboard video footage via high definition (HDTV) G1 camera going through the MPC system. *[The short test allowed the ground to test this relatively new system originating live from the ISS to JSC to NASA Headquarters to the NASA TV satellite and finally to potential clients for future use.]*

CEO photo targets uplinked for today were **Somalia Coast, Africa** *(the Somalia coastline experiences significant change in vegetation patterns and sand dune morphology with climatic change [such as El Nino events]. It is important to capture the existing configuration of coastal vegetation and morphology for later change detection. Overlapping nadir frames, taken along track, were requested),* and **Patagonian Glaciers, S. America** *(ISS orbit track took the crew over the southern Patagonian ranges and their summit glaciers. Of particular interest are glaciers and icefields on the western mountain front, which became visible as the station approached South America from the west. Nadir mapping frames were requested.)*

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are

downloaded by the public each month from this “Gateway” site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 7:33am EST [= epoch]):
Mean altitude -- 338.5 km
Apogee height -- 342.1 km
Perigee height -- 334.9 km
Period -- 91.30 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005384
Solar Beta Angle -- 13.7 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 130 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52459

Significant Events Ahead *(all dates Eastern Standard, some changes possible. NET = Not Earlier Than):*
01/30/08 -- EVA-14 (BMRRM R&R)
01/31/08 -- **Explorer-1 50 Years (1st U.S. Satellite on Redstone rocket)** *[see http://usspace50.com]*
02/04/08 -- Progress M-62/27P undocking (5:30am) & reentry
02/05/08 -- Progress M-63/28P launch (8:03am)
02/07/08 -- Progress M-63/28P docking (9:33am)
02/07/08(target date) -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite.02/09/08 -- Progress M-
02/22/08(NET) -- ATV-1 “Jules Verne” launch/Ariane V (Kourou, French Guyana)
03/06/08 -- ATV-1 Demo Day 1
03/12/08 -- ATV-1 Demo Day 2
03/13/08(target date) -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch

05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/06/08 -- STS-119/Discovery/15A launch – S6 truss segment
11/08/08 -- STS-119/Discovery/15A docking
11/17/08 -- STS-119/Discovery/15A undocking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/16/08
Date:	Wednesday, January 16, 2008 5:56:46 PM
Attachments:	

ISS On-Orbit Status 01/16/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Whitson & FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

FE-1 Malenchenko serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out" cycle to vacuum on absorbent bed #2 of the regenerable dual-channel filtration system. The regen process was terminated at ~2:00 EST. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods. Filter bed 1 was regenerated yesterday.]*

The FE-1 performed IFM (Inflight Maintenance) on the Service Module (SM)'s thermal control loops (KOB-1,2), removing the 3SPN1 pump assembly and replacing it with a new spare, followed by tests of the installation. *[This restores all four pump panels to operation, each pump panel with two operating pumps (ENAs).]*

After a spontaneous reboot of the KTsP1/CPC1 (Central Post Computer 1) in the SM, Malenchenko conducted troubleshooting and a health check on the computer.

In the Lab. CDR Whitson powered down the Lab PCS (Portable Computer System) laptops in support of the subsequent RPCM R&R (Remote Power Controller Module Removal & Replacement) and activated the Cupola Workstation laptop to maintain

a minimum PCS configuration during the R&R.

Afterwards, Peggy removed and replaced two RPCMs in the Lab,- LAB1P5 & LAB1D2.

FE-1 Malenchenko underwent his first Russian blood chemistry analysis test PZE MO-11, assisted by Dr. Whitson as CMO (Crew Medical Officer) as required. The exam was performed with the kits and accessories of the Reflotron-4 blood analyzer and supported by tagup with ground specialists. *[Earlier Reflotron versions have operated already on space station Mir. For the test, Malenchenko imbibed 250 ml of warm water or plain (unsweetened) tea, after which fresh blood was drawn from his finger with an Autoclix mini-lancet and a Reflotron pipette. Clinical data were then determined from the collected sample. Using various reagent tabs, the blood is tested with strips (KPI) for such parameters as hemoglobin, glucose, bilirubin, amylase, uric acid, triglycerides, urea, creatinin, cholesterol, etc. The tubes with blood samples were temporarily kept cool for the subsequent (post-breakfast) analysis. Reflotron-4 uses 40 W of power, supplied by the Service Module (SM)'s electrical system.]*

CDR Whitson continued her work with the MSG (Microgravity Science Glovebox) and the InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) experiment, today conducting runs #14 and #15, exchange video tapes and finally powering the MSG down. *[After activation of MSG and InSPACE & InSPACE-2 equipment, Peggy checked on alignment & focusing of MSG video cam #1, switched the magnetic field between runs, changed out the video recorder tape, turned off InSPACE & MSG and stowed the equipment. InSPACE, conducted last in June 2006 by Jeff Williams on Increment 13, obtains basic data on magnetorheological fluids, i.e., a new class of "smart materials" that can be used to improve or develop new brake systems, seat suspensions robotics, clutches, airplane landing gear, and vibration damper systems. The dispersed particles are contained in CAs (Coil Assemblies) in the MSG that subject them to electric fields of certain strength and frequencies.]*

FE-2 Tani worked in the U.S. Airlock (A/L), performing maintenance activities on the EMU (Extravehicular Mobility Unit) systems, centered on cycling the EMU SCOF (secondary oxygen package checkout fixture) valve to verify its function, plus starting (and later terminating) to scrub the EMU spacesuit cooling loops to prevent accumulation of contamination.)

Tani brought the EMU #3008 into the A/L for unbundling or installation in the EDDA (EMU Don Doff Assembly), filled its water tank (with vent port plugs installed) from CWC (Contingency Water Container) #1059 and afterwards initiated ionic and particulate filtration of #3008 with the ion and 3-micron filter. *[Purpose of the*

scrubbing, including iodination of the LCVGs (Liquid Cooling & Ventilation Garments) for biocidal maintenance, is the elimination of any biomass (organic) and particulate matter that may have accumulated in the loops.]

FE-1 Malenchenko inspected the Russian de-ionized water container (KOV EDV), used for supplying water to the Elektron oxygen (O_2) generator for electrolysis, for bubbles and possible need for filling up with U.S. condensate from a CWC (Contingency Water Container, #1071). *[Air bubbles larger than ~10 mm in the water must be prevented from getting into the BZh Liquid Unit where they could cause Elektron shutdown.]*

Dan Tani performed his daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 photo support). *[The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour.]*

Malenchenko completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Using the SKDS CMS (Pressure Control & Atmosphere Monitoring System/ Countermeasure System), the FE-1 took the periodic readings of potentially harmful contaminants in the SM. The hardware was then returned to initial stowage. *[The CMS uses preprogrammed microchips to measure Formaldehyde (H_2CO, methanal), Carbon Monoxide (CO) and Ammonia (NH_3), taking one measurement per microchip.]*

CDR Whitson performed the routine task of taking two photos of the internal part of the DC1's nadir docking cone (ASP SSVP), used for the recent Progress 27P docking, a standard practice after Russian dockings. The pictures were then transferred to OCA for subsequent downlinking. These images are used to refine current understanding of docking conditions. *[The objective is to take photo imagery of the scratch or scuff mark left by the head of the docking probe on the internal surface of the drogue (docking cone) ring, now rotated out of the passageway. As other crewmembers before him, the CDR used the Nikon D1X digital still camera to take two pictures each with the hatch closed down.]*

The FE-2 ran the periodic check of active U.S. payloads, i.e., cleaning the ANITA (Analyzing Interferometer for Ambient Air) inlet plus inspecting and filter cleaning of

the CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) incubator payload. *[The CGBA incubator is controlled from the ground, with automatic video downlinked to Earth. ANITA continues to collect data every six seconds and downlinks the data daily to the ground team. ANITA monitors low levels of potential gaseous contaminants in the ISS cabin atmosphere with a capability of simultaneously monitoring 32 gaseous contaminants. The experiment is testing the accuracy and reliability of this technology as a potential next-generation atmosphere trace-gas monitoring system for ISS and future spacecraft. This is a cooperative investigation with ESA.]*

Yuri conducted the periodic checkout/verification of IP-1 airflow sensors in the various RS hatch openings (8) in the SM, FGB and DC1.

Peggy Whitson checked out the setup of the BSMM (Multi-Channel Matching Unit) prepared by Yuri yesterday with new software, and conducted the scheduled HDD (Hard Disk Drive) test, followed by downlink of the resulting log file. *[BSMM is part of the OpsLAN (Operations Local Area Network), which also includes such items as the BSPN (Payload Server), OBC (Onboard Controller) for RokvISS, and GTS (Global Timing System).]*

After a recent failure (1/4) of the GTS (Global Timing System), Malenchenko performed troubleshooting on the system to recover it for operation.

At ~4:05pm EST, Dan Tani had his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-10 laptop),

The crewmembers performed their regular 2.5-hr physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2) , TVIS treadmill (FE-1), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Peggy Whitson copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

CEO photo targets uplinked for today were **South Tibesti Megafans, Africa** *(weather was clear over the Tibesti megafans area. Looking for overlapping, discontinuous dry channels and stream beds as indicators for the megafans. Overlapping, nadir frames taken along-track were requested),* **IPY – Aurora Borealis***;* **Heard Island, Southern Indian Ocean** *(some patchy cloud cover were present over Heard Island, but significant holes in the cloud desk should also have*

been present for photography. Looking to the right of track for this mountainous island - of particular interest are the glaciated mountain peaks), and **Patagonian Glaciers, S. America** *(weather was predicted to be clear over the Patagonian mountain ranges, providing an opportunity for imagery of summit glaciers. ISS passed over the northern end of the ranges. Imagery of the small summit glaciers on the interior [northeastern] range front was requested)*.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 8:45am EST [= epoch]):
Mean altitude -- 338.6 km
Apogee height -- 342.3 km
Perigee height -- 335.0 km
Period -- 91.31 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005478
Solar Beta Angle -- 9.7 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 146 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52444

Significant Events Ahead *(all dates Eastern Standard, some changes possible. NET = Not Earlier Than):*
01/30/08 -- EVA-14 (BMRRM R&R)
01/31/08 -- **Explorer-1 50 Years (1st U.S. Satellite on Redstone rocket)** *[see http://usspace50.com]*
02/04/08 -- Progress M-62/27P undocking (5:30am) & reentry
02/05/08 -- Progress M-63/28P launch (8:03am)
02/07/08 -- Progress M-63/28P docking (9:33am)
02/07/08(target date) -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite.02/09/08 -- Progress M-
02/22/08(NET) -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana)
03/06/08 -- ATV-1 Demo Day 1
03/12/08 -- ATV-1 Demo Day 2
03/13/08(target date) -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)

04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/06/08 -- STS-119/Discovery/15A launch – S6 truss segment
11/08/08 -- STS-119/Discovery/15A docking
11/17/08 -- STS-119/Discovery/15A undocking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/15/08
Date:	Tuesday, January 15, 2008 3:19:05 PM
Attachments:	

ISS On-Orbit Status 01/15/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Whitson & FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

FE-1 Malenchenko serviced the Russian BMP (Harmful Impurities Removal System), starting the "bake-out" cycle to vacuum on absorbent bed #1 of the regenerable dual-channel filtration system. The regen process will be terminated before sleeptime, at ~2:20pm EST. Regeneration of bed #2 follows tomorrow. *[Regeneration of each of the two cartridges takes about 12 hours and is conducted only during crew awake periods.]*

At ~3:15am, the FE-2 activated the VDS MPC (Video Distribution System/Multi-Purpose Converter) with its four downlinks to allow the ground to conduct HDTV (high-definition TV) playback and downlink operations. Later (~1:05pm), the MPC was powered off again.

The FE-1 used his standard ECOSFERA equipment, set up yesterday, to perform microbial air sampling runs for the MedOps SZM-MO-21 experiment, taking samples in the DC-1 Docking Compartment, followed by the standard pre-return sanitary-epidemiological incubation status checks (MedOps SZM-MO-22), collecting samples from cabin surfaces along with specimens from crewmembers for

sanitation and disease studies. The samples will be returned to Earth on Soyuz. *[The MO-21 equipment, consisting of an air sampler set, a charger and power supply unit, provides samples to help determine microbial contamination of the ISS atmosphere, specifically the total bacterial and fungal microflora counts and microflora composition according to morphologic criteria of microorganism colonies. The MO-22 equipment, similar to MO-21, complements the investigation.]*

The FE-2 worked in the Airlock (A/L), continuing the lengthy troubleshooting procedure on the ATU-6 (Audio Terminal Unit #6) on the A/L Avionics Rack which still has not performed satisfactorily after the recent troubleshooting (1/9). *[ATU-6 was installed by Clay Anderson on 10/11/07 in place of a failed unit, and the failed ATU-6 was returned on 10A. The new ATU-6 has been experiencing periodic lockups and PBIT (passive built-in test) faults. Of the 3 ATUs in the A/L, one of which must be functional for EVAs, so long as the suited VA crew has established UHF (Ultra High Frequency) radio communication.]*

Tani also removed and replaced an RPCM (Remote Power Controller Module, AL1A4AB) in the Airlock.

With ~2h10m set aside, Dan Tani continued the outfitting on the Service Module (SM) ventilation system started by Peggy Whitson on 1/4, cleaning four fans (VPO5, VPO6, VPO8, VPO9) behind panels before replacing their US-made noise suppressors (blue) with Russian acoustic mufflers (white).

Yuri Malenchenko transferred the newly arrived Russian payload TkhN-7 SVS (Self-Propagating High-Temperature Synthesis) from Progress 27P, set it up in the SM with its camcorder and digital still camera gear and activated the experiment. *[SVS uses its own camera, “Telescience” hardware from PK-3 (Plasma Crystallization) and the onboard Klest TV system for researching self-propagating high-temperature fusion of samples in space.]*

CDR Whitson continued her work with the MSG (Microgravity Science Glovebox) and the InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) experiment, today conducting runs #12 and #13, exchange video tapes and finally powering the MSG down. *[After activation of MSG and InSPACE & InSPACE-2 equipment, Peggy checked on alignment & focusing of MSG video cam #1, switched the magnetic field between runs, changed out the video recorder tape, turned off InSPACE & MSG and stowed the equipment. InSPACE, conducted last in June 2006 by Jeff Williams on Increment 13, obtains basic data on magnetorheological fluids, i.e., a new class of "smart materials" that can be used to improve or develop new brake systems, seat suspensions robotics, clutches, airplane landing gear, and vibration damper systems. The dispersed particles are contained in CAs (Coil Assemblies) in the MSG that subject them to*

electric fields of certain strength and frequencies.]

In the Soyuz 15S spacecraft, docked at the FGB nadir port, Malenchenko turned on the gas analyzer, a periodic checkup activity.

Yuri also loaded new software on the BSMM (Multi-Channel Matching Unit) in preparation for upcoming HDD testing. After the software installation, communications between the BSMM computer and the RS1 laptop was to be checked. *[BSMM is part of the OpsLAN (Operations Local Area Network), which also includes such items as the BSPN (Payload Server), OBC (Onboard Controller) for RokvISS, and GTS (Global Timing System).]*

Malenchenko broke out and prepared the hardware for his first Russian blood chemistry analysis test PZE MO-11 on Increment 16, scheduled tomorrow. The exam will be performed with the kits and accessories of the Reflotron-4 blood analyzer and supported by tagup with ground specialists.

Dan Tani worked on the PFA (Portable Fan Assembly), installing a ground wire. *[This item had been listed before on the discretionary "job jar" task list.]*

The crewmembers performed their regular 2.5-hr physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Dan copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~8:20am, the Expedition 16 crew conducted the standard teleconference with the Expedition 17 crew, via S-Band for audio and KU-Band for video.

At ~10:00 am, the crew participated in an interactive PAO TV downlink with WHO Radio, Des Moines, IA (Jim Boyd).

CEO photo targets uplinked for today were **Khartoum, Sudan** *(the Sudanese capital city is located at the confluence of the White and Blue Nile Rivers just north of a prominent agricultural region. This pass is in fair weather and mid-morning light. However, the nadir pass may be helpful in overcoming the effects of dust and smoke that typically cause loss of detail. Trying for mapping of the urban margins, especially along the river banks), Addis Ababa, Ethiopia (this capital city is located near the center of the rugged Ethiopian Highlands. Using Lake Tana to the north-*

northwest and the Rift Valley lakes the south to help find this difficult target area. This region is often cloudy in the afternoon, so on this morning pass looking left of track for context views only), **Heard Island** *(Heard Island is a bleak, uninhabited, and mountainous island located in the Southern Ocean; about two-thirds of the way from Madagascar to Antarctica. Its mountains are covered in glaciers and dominated by Mawson Peak, a 9,006 ft high complex volcano which forms part of the Big Ben massif. A long thin spit named "Elephant Spit" extends from the east of the island. The ISS pass was in mid-afternoon with weather satellite imagery suggesting clearing from the southwest. Looking well right of track and use the long lens for details),* and **S. Georgia/S. Sandwich** *(the South Georgia Island is an arching, mountainous and glaciated island that lies about 860 miles east-southeast of the Falkland Islands. The South Sandwich Islands form a separate island group and are to the southeast. Weather was expected to be mostly cloudy with occasional partial clearing, but where possible, the crew was to try for detailed views of the glaciers on the north coast of South Georgia. ISS passed it in early afternoon,and the crew was advised to look well right of track).*

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02/04/08 -- Progress M-62/27P undocking & reentry
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02/07/08 – Progress M-63/28P docking
02/07/08(target date) -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite.02/09/08 -- Progress M-
02/22/08(NET) -- ATV-1 “Jules Verne” launch/Ariane V (Kourou, French Guyana)
03/06/08 -- ATV-1 Demo Day 1
03/12/08 -- ATV-1 Demo Day 2
03/13/08(target date) -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
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04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/06/08 -- STS-119/Discovery/15A launch – S6 truss segment
11/08/08 -- STS-119/Discovery/15A docking
11/17/08 -- STS-119/Discovery/15A undocking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
04/15/09 -- **Constellation’s Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/14/08
Date:	Monday, January 14, 2008 12:44:27 PM
Attachments:	

ISS On-Orbit Status 01/14/08

All ISS systems continue to function nominally, except those noted previously or below. *Underway: Week 13 of Increment 16.*

CDR Whitson & FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

FE-1 Malenchenko worked several hours on a major rewiring task, restringing, installing and connecting cabling for the Russian RBO-3-3 Matryoshka-R radiation monitoring suite, before closing out the outfitting job.

After the RBO installations, Malenchenko supported the ground's activation of the Elektron O_2 generator at 32 amps by monitoring the external temperature of its secondary purification unit (BD) for the first 10 minutes of operations to ensure that there is no overheating. *[During nominal operations a gas analyzer is utilized to detect hydrogen (H_2) in the O_2 line (which could cause overheating) but is not included in the control algorithm until 10 minutes after Elektron startup.]*

For upcoming experiments with the U.S. Ultrasound payload, the CDR set up and powered on the HRF1 (Human Research Facility1) rack drawers, VTR (Video Tape Recorder), and Ultrasound front panel.

Closing down the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, FE-2 Tani mixed (homogenized) samples #1 through #6, then took documentary

photographs of each sample with a digital camera system, controlled by the EarthKAM software, shut down the laptop, stowed the BCAT-3 sample module and stowed the remaining equipment.

CDR Whitson continued her work with the MSG (Microgravity Science Glovebox) and the InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) experiment, today conducting runs #10 and #11, exchange video tapes and finally powering the MSG down. *[After activation of MSG and InSPACE & InSPACE-2 equipment, Peggy checked on alignment & focusing of MSG video cam #1, switched the magnetic field between runs, changed out the video recorder tape, turned off InSPACE & MSG and stowed the equipment. InSPACE, conducted last in June 2006 by Jeff Williams on Increment 13, obtains basic data on magnetorheological fluids, i.e., a new class of "smart materials" that can be used to improve or develop new brake systems, seat suspensions robotics, clutches, airplane landing gear, and vibration damper systems. The dispersed particles are contained in CAs (Coil Assemblies) in the MSG that subject them to electric fields of certain strength and frequencies.]*

Dan Tani had 2 hrs set aside for a detailed inspection of the spare BMRMM (Bearing Motor Roll Ring Module) that he and Peggy retrieved from PMA-3 (Pressurized Mating Adapter 3) on 1/2/08, preparatory to the upcoming R&R EVA-14.

Yuri spent 1h 30m on the TVIS treadmill for the periodic Russian PZE-MO-3 test for physical fitness evaluation, his first, using the TVIS in unmotorized mode and wearing the Kardiokassette KK-2000 belt with three chest electrodes. *[The fitness test, controlled from the RSE-Med laptop, yields ECG (electrocardiogram) readings to the KK-2000 data storage device, later to be downlinked via U.S. OCA. Before the run, the KK-2000 was synchronized with the computer date/time readings. For the ECG, the crewmembers worked out on the treadmill, first walking 3 min. up to 3.5 km/h, then running at a medium pace of 6.5 km/h, followed by the maximum pace not exceeding 10 km/h, then walking again at gradually decreasing pace.]*

In preparation for a microbial air sampling session scheduled tomorrow, the FE-1 unstowed the MedOps SZM-MO-21 ECOSFERA equipment and initiated charging on the Ecosphere power pack (BP). *[The equipment, consisting of an air sampler set, a charger, power supply unit, and incubation tray for Petri dishes, determines microbial contamination of the ISS atmosphere, specifically the total bacterial and fungal microflora counts and microflora composition according to morphologic criteria of microorganism colonies.]*

Later, Yuri completed today’s routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM),

including ASU toilet facilities systems/replaceables.

Malenchenko also conducted the daily 20-min. IMS (Inventory Management System) maintenance, updating/editing its standard “delta file” including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Continuing the current round of monthly preventive maintenance of RS (Russian Segment) ventilation systems, the FE-2 inspected and cleaned the “Group B” (B1 & B2) fan grills in the SM.

Malenchenko terminated the charging of the PD-150P DVCAM DSR videocam battery and cleaned up.

At 11:00am EST, Peggy and Dan participated in the periodic VHF-1 emergency communications check over NASA’s VHF (Very High Frequency) stations, today at the Dryden (11:00-11:07am) and White Sands VHF sites (11:02-11:09am), talking with Houston/Capcom, MSFC/PAYCOM (Payload Operation & Integration Center Communicator) and Moscow/GLAVNI (TsUP Capcom) in the normal fashion via VHF radio from a handheld microphone and any of the U.S. segment ATUs (audio terminal units). *[Purpose of the test is to verify signal reception and link integrity, and to ensure minimum required link margin during emergency (no TDRS) and special events (such as a Soyuz relocation).]*

The crewmembers performed their regular 2.5-hr physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-2, FE-1/MO-3), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Peggy copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

No CEO photo targets uplinked for today.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this “Gateway” site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 8:21 am EST [= epoch]):
Mean altitude – 338.9 km
Apogee height -- 342.6 km
Perigee height -- 335.3 km
Period -- 91.31 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0005484
Solar Beta Angle -- 1.3 deg (magnitude increasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 155 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52412

Significant Events Ahead *(all dates Eastern Standard, some changes possible. NET = Not Earlier Than):*
01/31/08 -- **Explorer-1 50 Years (1st U.S. Satellite on Redstone rocket)** *[see http://usspace50.com]*
02/04/08 -- Progress M-62/27P undocking & reentry
02/05/08 -- Progress M-63/28P launch
02/07/08 – Progress M-63/28(docking
02/07/08(target date) -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite.02/09/08 -- Progress M-63/28P docking (DC1) - (~2:45pm EST).
02/22/08(NET) -- ATV-1 “Jules Verne” launch/Ariane V (Kourou, French Guyana)
03/06/08 -- ATV-1 Demo Day 1
03/12/08 -- ATV-1 Demo Day 2
03/13/08(target date) -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch

09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/06/08 -- STS-119/Discovery/15A launch – S6 truss segment
11/08/08 -- STS-119/Discovery/15A docking
11/17/08 -- STS-119/Discovery/15A undocking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/13/08
Date:	Sunday, January 13, 2008 12:14:42 PM
Attachments:	

ISS On-Orbit Status 01/13/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday -- off-duty day for CDR Whitson, FE-1 Malenchenko and FE-2 Tani. Ahead: Week 13 of Increment 16.*

CDR Whitson & FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

FE-1 Malenchenko prepared for today's last day of his five-day wearing test of the spring-loaded "Penguin-3" antigravity pressure/stress suit with its load measuring system (SIN), donning the suit and its equipment, then going about his business and downloading performance measurements several times. *[Each day, Yuri has selected higher symmetrical (shoulders) & asymmetrical (chest & back) loads (~20-30 kgf), after calibrating the system with no load on the suit's internal tension straps. Load data are then collected by the SIN electronics (via analog-to-digital converters) and downloaded to a A31p laptop three times daily, followed by downlink to the ground via BSR-TM.]*

FE-2 Tani performed his daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 photo support). *[The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation*

occurring in the BCAT Sample 3, with the photo flash going off every half hour.]

Malenchenko completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including ASU toilet facilities systems/replaceables, the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP.

The crewmembers performed their regular 2.5-hr physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

The CDR and FE-2 each had their weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-10 laptop), Dan at ~9:05am EST, Peggy at ~12:00pm.

Working off his discretionary "time permitting" task list, Yuri conducted another session of the Russian "Uragan" (hurricane) earth-imaging program, using the Nikon D2X digital camera with 800 mm focal length lens. *[Targets uplinked for today were Patagonia Glaciers and Icebergs in the Drake Passage.]*

A second job item on the FE-1's voluntary list for today was another KPT-3 session to make observations and take aerial KPT-3 photography of environmental conditions for Russia's Environmental Safety Agency (ECON) using the Nikon D2X digital camera with SIGMA 300-800mm telephoto lens.

Task items on Peggy's and Dan's discretionary "job jar" task list today were (1) a thorough review of uplinked draft material on the BMRRM (Bearing Motor Roll Ring Module) hardware and EVA-14 procedures for its upcoming R&R, (2) an audit of CTB (Cargo Transport Bags) and their contents, and (3) installation of a ground wire on the PFA (Portable Fan Assembly).

No CEO photo targets uplinked for today.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 8:02am EST [= epoch]):

Mean altitude – 33o9.1 km
Apogee height -- 342.8 km
Perigee height -- 335.4 km
Period -- 91.32 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.000556
Solar Beta Angle -- -3.2 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.77
Mean altitude loss in the last 24 hours -- 90 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52396

Significant Events Ahead *(all dates Eastern Standard, some changes possible. NET = Not Earlier Than):*
01/31/08 -- **Explorer-1 50 Years (1st U.S. Satellite on Redstone rocket)** *[see http://usspace50.com]*
02/04/08 -- Progress M-62/27P undocking & reentry
02/05/08 -- Progress M-63/28P launch
02/07/08 – Progress M-63/28(docking
02/07/08(target date) -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite.02/09/08 -- Progress M-63/28P docking (DC1) - (~2:45pm EST).
02/22/08(NET) -- ATV-1 “Jules Verne” launch/Ariane V (Kourou, French Guyana)
03/06/08 -- ATV-1 Demo Day 1
03/12/08 -- ATV-1 Demo Day 2
03/13/08(target date) -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC

09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/06/08 -- STS-119/Discovery/15A launch – S6 truss segment
11/08/08 -- STS-119/Discovery/15A docking
11/17/08 -- STS-119/Discovery/15A undocking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/12/08
Date:	Saturday, January 12, 2008 5:10:24 PM
Attachments:	

ISS On-Orbit Status 01/12/08

All ISS systems continue to function nominally, except those noted previously or below. Saturday -- off-duty day for CDR Whitson, FE-1 Malenchenko and FE-2 Tani except for housekeeping and voluntary work.

CDR Whitson & FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the Service Module (SM) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the CDR's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

As part of the house cleaning, FE-1Malenchenko performed preventive maintenance cleaning on the FS5, FS6, FS9, VPkhO, VdPrK, VPrK & TsV2 fan grilles in the SM, DC1 Docking Module and FGB (Funktsionalnyi-Grusovoi Blok).

The FE-1 also prepared for today's fourth day of his five-day wearing test of the spring-loaded "Penguin-3" antigravity pressure/stress suit with its load measuring system (SIN), donning the suit and its equipment, then going about his business

and downloading performance measurements several times. *[Each day, Yuri selects higher symmetrical (shoulders) & asymmetrical (chest & back) loads (~20-30 kgf), after calibrating the system with no load on the suit's internal tension straps. Load data are then collected by the SIN electronics (via analog-to-digital converters) and downloaded to an A31p laptop three times daily, followed by downlink to the ground via BSR-TM.]*

FE-2 Tani retrieved and stowed the two FMKs (Formaldehyde Monitoring Kits) deployed by him on 1/10 in the Lab (below CEVIS cycle) and SM (most forward handrail on panel 307).

Dan also performed his daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 photo support). *[The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour.]*

For today's VolSci (Voluntary Weekend Science) program, CDR Whitson continued her work with the MSG (Microgravity Science Glovebox) and the InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) experiment, today conducting runs #7, #8, and #9, then powered down the payload and switched the MSG to standby. *[After activation of MSG and InSPACE & InSPACE-2 equipment, Peggy checked on alignment & focusing of the two MSG video cams, switched the magnetic field between runs, changed out video recorder tapes and later deactivated InSPACE & MSG. InSPACE, conducted last in June 2006 by Jeff Williams on Increment 13, obtains basic data on magnetorheological fluids, i.e., a new class of "smart materials" that can be used to improve or develop new brake systems, seat suspensions robotics, clutches, airplane landing gear, and vibration damper systems. The dispersed particles are contained in CAs (Coil Assemblies) in the MSG that subject them to electric fields of certain strength and frequencies.]*

At ~9:45am EST, the crewmembers held their regular weekly planning conference (WPC) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly by MCC-H and TsUP/Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

Later, Yuri completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including ASU toilet facilities systems/replaceables, the weekly collection of the

toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP.

The crewmembers performed their regular 2.5-hr physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Dan Tani copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~6:35am, Yuri Malenchenko had a PFC (Private Family Conference) via S-band/ audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-10 laptop).

Working off his discretionary “time permitting” task list, Yuri conducted another session of the Russian "Uragan" (hurricane) earth-imaging program, using the Nikon D2X digital camera with 800 mm focal length lens. *[Targets uplinked for today were Icebergs in Scotia Sea and Patagonia Glaciers.]*

A second job item on the FE-1’s voluntary list for today was another KPT-3 session to make observations and take aerial KPT-3 photography of environmental conditions for Russia's Environmental Safety Agency (ECON) using the Nikon D2X digital camera with SIGMA 300-800mm telephoto lens.

The CDR and FE-2 had a number of newly added jobs on their “job jar” task list: (1) in Node-2 put two hatch latches to hard stop position; (2) take SLM (Sound Level Measurement) data in Node-2 and transfer them to laptop for downlink; and (3) conduct the regular FDS PEP (Fire Detection & Suppression/Portable Emergency Provisions) safety inspection/audit.

Reboost Update: The ISS reboost yesterday by the twin SM main engines was successfully conducted on time (7:42pm EST). Purpose of the 1m 58s long maneuver burn was to establish the correct phasing conditions for 27S launch and the STS-122/1E launch season (FD3 rendezvous). The reboost produced a delta-velocity (delta-V) of 3.1 m/s (predicted: 3.0 m/s; ~5% overburn). Mean altitude increase (delta-H): 5.4 km (2.9 nmi).

Weekly Science Update (Expedition Sixteen -- Week 12)

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): ALTEINO instrument has been rotated by the crew on 1/8 and memory card has been

exchanged. Photos of the new configuration have been taken and placed on OCA for down-link. On 1/9 data has been downlinked. Data and photos will be analyzed by the science team as soon as available..

ANITA: Completed.

BCAT-3 (Binary Colloidal Alloy Test 3): "Getting great data for sample 3, Dan's setup is the best design so far, (more stable), and we continue to learn from astronauts clever techniques."

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): "Dan, we are waiting to get the new launch date so we can schedule your second in-flight session to meet the R-21 to R-14 requirement. This activity will be hard scheduled when we get a firm launch date."

CFE (Capillary Flow Experiment): Reserve.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): In progress.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): In progress.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): "InSPACE-2 began operations in the Microgravity Science Glovebox (MSG) on Saturday, 1/5/ 08. This is a follow-on science payload to the successful InSPACE experiment conducted in 2003 and 2006. The first six test runs were performed. Two of four samples of different particle concentrations were tested at three different magnetic field strengths and at a frequency of 20 Hz. The preliminary images looked excellent, clearly showing the microstructure developing during the steady and pulsed magnetic fields, according to Professor Eric Furst, the Principal Investigator at the University of Delaware. The new time stamping feature

on the science video, made possible through a new video cable, provides unambiguous time correlation of the downlink video."

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): Complete.

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 "Pirs".

MULTIGEN-1: MULTIGEN-1 samples will be downloaded on STS-122 (1E).

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION/REPOSITORY: " Dan, thank you for your voluntary participation in a stand-alone Repository session. Your attention in keeping to the time constraints was much appreciated!".

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): In progress.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): In progress.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

CEO (Crew Earth Observation): Through 1/9 the ground has received a total of 9,988 frames of ISS/CEO imagery for review and cataloging. That includes over 1,600 frames in the past week alone! "The quality of your imagery remains high,

especially in composition, with many striking oblique and low-light views. Your excellent view of the coastal city of Beirut, Lebanon will be published on NASA/ GSFC's Earth Observatory web page this weekend. Nice shot! Thanks also for you efforts to acquire IPY imagery of Polar Mesospheric Clouds. This is a challenging phenomenon to predict and observe."

CEO photo targets uplinked for today were **South Tibesti Megafans, Africa** *(weather was predicted to be clear over the Tibesti region. Orbit track took the ISS over the center of the target area. Looking for discontinuous overlapping dry stream channels as indicators of the megafans. Nadir mapping frames taken along-track were requested),* **Teide Volcano, Canary Islands** *(the Teide Volcano, located on the island of Tenerife is a Decade Volcano [due to its high eruption hazard potential] and the highest peak in the Atlantic Ocean. Looking to the right of track as ISS approached the Canary Islands. The triangular island of Tenerife is distinctive, and Teide is located with an elliptical caldera formed by previous eruptions. Context views of the islands and Teide Volcano were requested),* and **Polar Mesospheric Clouds — PMC, Antarctica** *(IPY--PMC radar research station active. GMTs for this and subsequent PMC opportunities were chosen for closeness to the Antarctic PMC radar research site at 73S 13W. Radar is switched on during ISS passes at the given GMTs. But the crew was to feel free to look south during any night awake pass).*

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 8:53am EST [= epoch]):
Mean altitude -- 339.2 km
Apogee height -- 343.1 km
Perigee height -- 335.2 km
Period -- 91.32 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.000588
Solar Beta Angle -- -7.8 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.79
Mean altitude gain in the last 24 hours -- 5.4 km
Revolutions since FGB/Zarya launch (Nov. 98) -- 52381

Significant Events Ahead *(all dates Eastern Standard, some changes possible.*

NET = Not Earlier Than):
01/31/08 -- **Explorer-1 50 Years (1st U.S. Satellite on Redstone rocket)** *[see http://usspace50.com]*
02/04/08 -- Progress M-62/27P undocking & reentry
02/05/08 -- Progress M-63/28P launch
02/07/08 – Progress M-63/28(docking
02/07/08(target date) -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite.02/09/08 -- Progress M-63/28P docking (DC1) - (~2:45pm EST).
02/22/08(NET) -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana)
03/06/08 -- ATV-1 Demo Day 1
03/12/08 -- ATV-1 Demo Day 2
03/13/08(target date) -- STS-123/Endeavour/1J/A launch/1J/A, w/SLP-SPDM, JEM ELM-PS
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/06/08 -- STS-119/Discovery/15A launch – S6 truss segment
11/08/08 -- STS-119/Discovery/15A docking
11/17/08 -- STS-119/Discovery/15A undocking
11/20/08 -- **ISS 10 Years**

11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/11/08
Date:	Friday, January 11, 2008 12:17:51 PM
Attachments:	

ISS On-Orbit Status 01/11/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Whitson & FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

At ~3:10am EST, the FE-2 activated the VDS MPC (Video Distribution System/Multi-Purpose Converter) with its four downlinks to allow the ground to conduct HDTV (high-definition TV) playback and downlink operations. Later (~11:30am), the MPC was powered off again.

At ~4:15am, Dan Tani powered down the VSW (Video Streaming Workstation), set up last month to convert and/or downlink analog video from the Russian segment (RS) to MCC-Houston and thence to TsUP-Moscow.

In the DC1 Docking Compartment, FE-1 Malenchenko terminated the discharge cycle of the third 825M3 Orlan battery pack and removed it from the charger.

Malenchenko had 2h 30m hrs reserved to experiment with the Russian KPT-2 science payload "BAR-RM", testing innovative procedures to detect air leakage from ISS modules using the RSE-1 laptop and downlinking the data via BSR-TM channel. *[BAR-RM is designed to develop a procedure for detection of air leakage from ISS modules based on environmental data anomalies (temperature, humidity,*

ultrasound emissions). The payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/thermometer (TTM-2), an ultrasound analyzer (AU-01), and a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station. Measurements are taken in specific zones (13 in SM PkhO and 4 in DC1), both with lights & fans turned on and off.]

Whitson & Tani completed their third run with the MedOps WinSCAT (Spaceflight Cognitive Assessment Tool) experiment by logging in on the MEC (Medical Equipment Computer) and performing the psychological evaluation exercise on the laptop-based WinSCAT experiment. *[WinSCAT is a time-constrained questionnaire test of cognitive abilities, routinely performed by astronauts aboard the ISS every 30 days before or after the PHS (periodic health status) test or on special CDR's, crewmembers or flight surgeons request.]*

Yuri Malenchenko prepared for today's third day of his five-day wearing test of the spring-loaded "Penguin-3" antigravity pressure/stress suit with its load measuring system (SIN), donning the suit and its equipment, then going about his business while downloading performance measurements. *[During each of the five days, Yuri selects higher symmetrical (shoulders) & asymmetrical (chest & back) loads (~20-30 kgf), after calibrating the system with no load on the suit's internal tension straps. Performance/body motion data are then collected by the SIN electronics (via analog-to-digital converters) and downloaded to an A31p laptop three times daily, followed by downlink to the ground via BSR-TM. The load suit is intended to retain muscle tone during long-duration missions and also retain the crewmember's normal height to facilitate his/her fit in their individual Kazbek seat in the Soyuz.]*

In the Soyuz 15S, docked at the FGB nadir port, Dan, Peggy and Yuri conducted the standard fit check of the Kazbek couches, the contoured shock absorbing seats in the Descent Module. For Yuri, Kazbek measurements will be useful to test the efficacy of the Pinguin-3 exercise. *[For the fit check, crew members removed their cabin suits and donned Sokol KV-2 suit and comm caps, getting into in their seats and assessing the degree of comfort and uniform body support provided by the seat liner. Using a ruler, they then measured the gap between the top of the head and the top edge of the structure facing the head crown. The results were reported to TsUP. Kazbek-UM couches are designed to withstand g-loads during launch and orbital insertion as well as during reentry and brake-rocket-assisted landing. Each seat has two positions: cocked (armed) and noncocked. In cocked position, they are raised to allow the shock absorbers to function during touchdown. The fit check assures that the crewmembers, whose bodies gain in length during longer-term stay in zero-G, will still be adequately protected by the seat liners for their touchdown in Kazakhstan, either emergency or regular return.]*

CDR Whitson continued her work with the MSG (Microgravity Science Glovebox) and the InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) experiment, today conducting runs #4, #5, and #6 (new samples of slightly higher concentration), then exchanging the vial assembly. MSG was powered down afterwards. *[After activation of MSG and InSPACE & InSPACE-2 equipment, Peggy checked on alignment & focusing of the two MSG video cams, switched the magnetic field between runs, changed out video recorder tapes and later deactivated InSPACE & MSG. InSPACE, conducted last in June 2006 by Jeff Williams on Increment 13, obtains basic data on magnetorheological fluids, i.e., a new class of "smart materials" that can be used to improve or develop new brake systems, seat suspensions robotics, clutches, airplane landing gear, and vibration damper systems. The dispersed particles are contained in CAs (Coil Assemblies) in the MSG that subject them to electric fields of certain strength and frequencies.]*

Continuing the current round of RS ventilation system maintenance, FE-2 Tani worked in the Service Module (SM), replacing the four PF1-4 dust collectors, then in the FGB (*Funktsionalnyi-Grusovoi Blok*) where he replaced the PS1 & PS2 dust filters.

The FE-2 performed his daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 photo support). *[The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour.]*

Dan also filled out the regular FFQ (Food Frequency Questionnaire), his 9th, on the MEC (Medical Equipment Computer). *[By means of these FFQs, U.S. astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins.]*

The FE-1 began gathering tools, cabling and equipment for a major outfitting job for the RBO-3-3 MATRYOSHKA-R radiation monitoring payload in the RS, behind SM panels 121 & 122, scheduled for next Monday (1/14). Specialists stood by at TsUP for tagup as required.

The CDR ran the periodic check of active U.S. payloads, i.e., cleaning the ANITA (Analyzing Interferometer for Ambient Air) inlet plus inspecting and filter cleaning of the CGBA-5 (Commercial Generic Bioprocessing Apparatus 5) incubator payload. *[The CGBA incubator is controlled from the ground, with automatic video*

downlinked to Earth. ANITA continues to collect data every six seconds and downlinks the data daily to the ground team. ANITA monitors low levels of potential gaseous contaminants in the ISS cabin atmosphere with a capability of simultaneously monitoring 32 gaseous contaminants. The experiment is testing the accuracy and reliability of this technology as a potential next-generation atmosphere trace-gas monitoring system for ISS and future spacecraft. This is a cooperative investigation with ESA.]

After switching the ANITA equipment from local sampling mode to non-local sampling via its user interface software, Dan Tani used a hand pump and sample bag to collect a non-local ambient air sample from the FGB/Node-1 location, for subsequent analysis in the ER4 (EXPRESS Rack 4) ANITA drawer. *[Developed by ESA, ANITA is a potential next-generation trace-gas analysis system that uses a Fourier-Transform Infrared (FTIR) spectrometer to determine concentrations of up to 32 different trace gases in the cabin atmosphere (measuring absorbance vs. wavelength). ANITA provides continuous, automatic air sampling from its location in ER4, taking one local sample every 6 minutes, for medical personnel during the first ten days, later for environmental specialists. Data are stored on the ANITA laptop hard drive, with a representative data set downlinked daily by ground command.]*

Malenchenko used the AK-1M adsorber and IPD-CO Draeger tubes to conduct the periodic sampling of cabin air for subsequent analysis on the ground. *[Yuri started out by taking air samples in the SM and FGB and to check for leaked-out Freon in the SM, then switched to the IPD-CO Draeger tubes sampler to check for CO (carbon monoxide) in the SM.]*

The CDR took air samples for the periodic (weekly) atmospheric status check for ppO_2 (Partial Pressure Oxygen) and $ppCO_2$ (pp Carbon Dioxide), using the hand-held CSA-CP (Compound Specific Analyzer-Combustion Products), CSA-O_2 (CSA - Oxygen sensor) and CDMK (CO_2 Monitoring Kit). Batteries were to be replaced if necessary. *[Purpose of the 15-min activity is to trend with MCA (Major Constituents Analyzer), i.e., to correlate the hand-held readings with MCA measurements.]*

Air samples were also collected by Dan, with a U.S. GSC (Grab Sample Container) at the center of the Lab, SM and FGB.

The FE-1 inspected the Russian de-ionized water container (KOV EDV), used for supplying water to the Elektron oxygen (O_2) generator for electrolysis, for bubbles and possible need for filling up with U.S. condensate from a CWC (Contingency

Water Container, #1071). *[Air bubbles larger than ~10 mm in the water must be prevented from getting into the BZh Liquid Unit where they could cause Elektron shutdown.]*

Tani verified closure of the protective Lab window shutter for the ISS reboost scheduled later tonight (7:42pm EST). The shutter may be reopened at ~11:50pm when all potential plume residuals have dispersed two orbits later.

Yuri completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

The crewmembers performed their regular 2.5-hr physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (CDR, FE-2, FE-1), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Dan Tani copied the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~6:20am, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~6:35am EST, Yuri was scheduled to link up with TsUP stowage specialists via S-band to conduct the weekly IMS tagup, discussing stowage issues and equipment locations.

At ~11:10am, Peggy, Yuri and Dan conducted their standard bi-weekly teleconference with the JSC Astronaut Office (Steve Lindsey), via S-band S/G-2 audio & phone patch.

At ~2:50pm, the crew is scheduled for their eighth weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC-10 (Station Support Computer 10)]*.

Reboost Update: For tonight's ISS reboost, the new delta-V of 3 m/s was determined to account for the changed launch dates of Progress 28P (2/5) and STS-122/1E (2/7). The maneuver by the SM main engine, at 7:42pm EST, is planned for a burn duration of 1m 58s and an altitude increase (delta-h) of 5.2 km/2.8 n.mi. Attitude control authority will be handed over to Russian MCS (Motion Control

System) at 6:00pm and returned to US MMC (Momentum Management Control) at ~8:35pm.

CEO (Crew Earth Observation) photo targets uplinked for today again were **Perth, Australia** *(ISS had a near-nadir pass over Perth, the capital and largest city of the state of Western Australia. Weather conditions were predicted to be mostly clear. Overlapping mapping frames were requested as the station traversed the urban center, located to the left of track. Such imagery is useful for monitoring land cover and land use change both within the city center and along the urban-rural fringe),* and **Polar Mesospheric Clouds — PMC, Antarctica** *(IPY--PMC radar research station active. GMTs for this and subsequent PMC opportunities were chosen for closeness to the Antarctic PMC radar research site at 73S 13W. Radar is switched on during ISS passes at the given GMTs. But the crew was to feel free to look south during any night awake pass).*

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 8:26am EST [= epoch]):
Mean altitude -- 333.9 km
Apogee height -- 335.8 km
Perigee height -- 332.1 km
Period -- 91.21 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0002764
Solar Beta Angle -- -12.5 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.79
Mean altitude loss in the last 24 hours -- 142 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52365

Significant Events Ahead *(all dates Eastern Standard, some changes possible. NET = Not Earlier Than):*
01/11/08 -- ISS reboost; ~7:42pm, delta-V 3.0m/s; SM main engine (2 KD thrusters & ODU props)
01/31/08 -- **Explorer-1 50 Years (1st U.S. Satellite on Redstone rocket)** *[see http://usspace50.com]*
02/04/08 -- Progress M-62/27P undocking & reentry
02/05/08 -- Progress M-63/28P launch

02/07/08 -- Progress M-63/28P docking (DC1)
02/07/08(NET) -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite (~2:45pm EST).
02/22/08(NET) -- ATV-1 “Jules Verne” launch/Ariane V (Kourou, French Guyana)
02/14/08 -- STS-123/Endeavour/1J/A launch/1J/A, ~11:53am, w/SLP-SPDM, JEM ELM-PS
02/16/08 -- STS-123/Endeavour/1J/A docking
02/27/08 -- STS-123/Endeavour undocking
02/29/08 -- STS-123/Endeavour landing
03/06/08 -- ATV-1 Demo Day 1
03/12/08 -- ATV-1 Demo Day 2
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM “Kibo”, racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
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09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
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11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/06/08 -- STS-119/Discovery/15A launch – S6 truss segment
11/08/08 -- STS-119/Discovery/15A docking
11/17/08 -- STS-119/Discovery/15A undocking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)

04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/10/08
Date:	Thursday, January 10, 2008 12:38:38 PM
Attachments:	

ISS On-Orbit Status 01/10/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Whitson & FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Upon wakeup, FE-1 Yuri Malenchenko terminated his seventh MBI-12 SONOKARD experiment session, started last night, by taking the recording device from his SONOKARD sports shirt pocket and later copying the measurements to the RSE-MED laptop for subsequent downlink to the ground. *[SONOKARD objectives are stated to (1) study the feasibility of obtaining the maximum of data through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]*

FE-2 Tani completed the visual "T+2 Day" microbial (bacterial & fungal) analysis of the Week 11 potable water samples, collected on 1/8 and processed on board with the MCDs (Microbial Capture Devices). *[On 1/8, three samples (225 mL each) were taken in the Service Module (SM) -- at the potable water SRV-K hot port, SRV-K warm port & SVO-ZV tap for inflight analysis, plus two chemical post-flight samples (750 mL) for return on 1E from SRV-K warm & SVO-ZV.]*

CDR Whitson, assisted by Dan Tani, had several hours set aside for the R&R (Removal & Replacement) of the leaking EXPRESS Rack 1 (ER1) ITCS (Internal Thermal Control System) pressure relief valve but completed the job successfully in a record time of 37 min, after some preparatory work yesterday. Peggy also took documentary photographs of the rack without all the lockers and drawers installed. *[A fluid leak in ER1 was identified in late 2005, and the valve was identified as the most likely suspect. The rack's anomaly has significantly impacted the science community. A spare valve was delivered on 12A.1 and installed today. The suspect valve was not designed as an ORU (Orbital Replacement Unit), but its R&R restores full functionality to the rack. ER1, with 8 lockers and 2 drawers containing SAMS (Space Accelerations Measuring System) & MAMS (Microgravity Accelerations Measuring System), has been inactive since 1/2.]*

Peggy later assisted the ground in activating the SAMS by turning on the ICU (Interim Control Unit) in ER1 (Drawer 1).

In the DC1 (Docking Module), with temporary comm link established, FE-1 Malenchenko terminated discharging the second Orlan 825M3 battery pack and started the discharge process on pack #3 (of three).

Yuri then continued his three-day life-extension maintenance on the three Russian Orlan-M spacesuits #25, #26 & #27 in DC1, today doing more spacesuit and BSS (Orlan Interface Unit) leak and valve tests, including a hermeticity check on the Orlan #26 backup bladder. Normal comm was restored after activity closeout.

The FE-1 prepared for today's second day of a new five-day wearing test of the spring-loaded "Penguin-3" antigravity pressure/stress suit with its load measuring system (SIN), donning the suit and its equipment, then going about his business and downloading performance measurements several times. *[During each of the five days, Yuri selects higher symmetrical (shoulders) & asymmetrical (chest & back) loads (~20-30 kgf), after calibrating the system with no load on the suit's internal tension straps. Performance/body motion data are then collected by the SIN electronics (via analog-to-digital converters) and downloaded to an A31p laptop three times daily, followed by downlink to the ground via BSR-TM. The load suit is intended to retain muscle tone during long missions and also retain the crewmember's normal height to facilitate his/her fit in their individual Kazbek seat in the Soyuz.]*

The CDR performed the periodic deployment of two passive FMK (formaldehyde monitoring kit) sampling assemblies in the Lab (below CEVIS) and SM (most forward handrail) for two days, to catch any atmospheric formaldehyde on a collector substrate for subsequent analysis on the ground.

The FE-2 completed his daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 photo support). *[The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour.]*

Peggy Whitson conducted the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week (currently #16-0018N).]*

Dan Tani deployed a new WAP (Wireless Access Point) unit each in Node-1 and Node-2. Afterwards, he loaded the crew PDAs (Personal Digital Assistants) with new IMS/BCR (Inventory Management System/Bar Code Reader) software and deployed the PDAs by configuring them for use with the new WAPs. *[WAP2 allows the usage of the wireless WiFi capabilities of the PDA for IMS updating, editing & synchronizing from throughout the station.]*

Whitson worked for about half an hour on the CMRS (Crew Medical Restraint System), stowed in the CHeCS (Crew Health Care Systems) rack, to perform the periodic checkout and inspection of the system for upcoming standard CMO (Crew Medical Officer) proficiency training. *[Peggy inspected the CMRS for cracks in the board and/or metal fastener exposed on top of CMRS (found on the ground units), either of which could provide a high-voltage defibrillation ground path from the patient to ISS structure. The board-like CMRS allows strapping down a patient on the board with a harness for medical attention by the CMO who is also provided with restraints around the device. The device can be secured to the ISS structure within two minutes to provide a patient restraint surface for performing emergency medical procedures, such as during ACLS (Advanced Cardiac Life Support). It can also be used to transport a patient between the station and the Orbiter middeck. It isolates the crew and equipment electrically during defibrillations and pacing electrical discharges, accommodates the patient in the supine zero-G positions, provides cervical spine stabilization and, for a three-person crew, can also restrain two CMOs during their delivery of medical care.]*

Malenchenko transferred the new Russian KPT-2 "BAR-RM" science payload from Progress 27P, set it up and prepared it for subsequent operation. After taking measurements, the FE-1 was to downlink the data via BSR-TM channel from the RSE-1 laptop and close out operations with hardware deactivation. *[BAR-RM is designed to develop a procedure for detection of air leakage from ISS modules*

based on environmental data anomalies (temperature, humidity, ultrasound emissions). The payload uses a remote infrared thermometer (Kelvin-Video), a thermohygrometer (Iva-6A), a heat-loss anemometer/thermometer (TTM-2), an ultrasound analyzer (AU-01), and a leak detector (UT2-03) to determine physical background signs of loss of ISS pressure integrity which could be indicative of leaks in the working compartments of the station. Measurements are taken in specific zones (13 in SM PkhO and 4 in DC1), both with lights & fans turned on and off.]

Yuri also completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables.

Working off his discretionary "time permitting" task list, the FE-1 later conducted the daily 20-min. IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The crewmembers performed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Dan Tani transferred the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~9:20am EST, the CDR and FE-2 supported two interactive PAO interviews with TV stations of 10 min each, one with WHO-TV in Des Moines, IA (Brooke Bouma), the other with WMAQ-TV in Chicago, IL (Phil Rogers).

Reboost Preview: Tomorrow's ISS reboost with the SM main engine (2 KD thrusters & ODU props) is scheduled for 7:42pm EST, with magnitude of the desired delta-V currently under review (typ.: ~3 m/s) since it is mostly designed for phasing for Progress 28P rendezvous as well as STS-122/1E docking on FD3. For example: If the Shuttle launch moves into the February window (starting 2/7), rescheduling of 28P launch from 2/7 to, say, 2/5 would be required to deconflict the two launches/dockings, which in turn determines the reboost delta-V tomorrow evening. Stay tuned.

PPS P6 Reconditioning: At ~10:00am EST, reconditioning (discharge/recharge) maintenance has started on the truss P6 batteriy sets 2B2 (channel 2B) and 4B2 (channel 4B), simultaneously. The approximate timeframe for the reconditioning

runs from today to 1/19. After today's start of discharge, the batteries will be transitioned to recharge on 1/14. Times for the second discharge/recharge cycle will be adjusted after observing the first charge cycle.

BCC Dry Run: Early this morning, MCC-Houston conducted another BCC (Backup Control Center) dry run in test mode, with no involvement of the ISS crew or vehicle. The seven-hour exercise started at 1:00am EST. *[Purpose of this periodic exercise is to demonstrate BCC functionality under Russian assets while providing proficiency training for Moscow-HSG (Houston Support Group) personnel at the HSR (Houston Support Room) and TsUP-Moscow specialists.]*

CEO (Crew Earth Observation) photo targets uplinked for today again were **South Tibesti Megafans, Africa** *(weather was predicted to be clear over this region of ancient dry river channels. The Tibesti megafans were formed by rivers and streams that flowed during a much wetter climatic regime [approximately 8000 years ago] than currently exists in the Sahara. Nadir-viewing, overlapping frames taken along-track were requested to map the southwestern extent of the megafans; looking for a discontinuous pattern of overlapping channels),* **Tenoumer Impact Crater, Mauritania** *(the crew had a near-nadir pass over this geologically young [~21,000 years old] impact structure. Looking to the left of track for the well-defined circular crater, located to the north of a dune field),* **Polar Mesospheric Clouds — PMC, Antarctica** *(IPY--PMC radar research station active. GMTs for this and subsequent PMC opportunities were chosen for closeness to the Antarctic PMC radar research site at 73S 13W. Radar is switched on during ISS passes at the given GMTs. But the crew was to feel free to look south during any night awake pass),* and **Madrean Sky Islands, North America** *(ISS orbit track paralleled mountains in northern Mexico that are part of the "sky islands". These cool, moist, high-altitude pine-oak forested mountain summits are surrounded by desert. The ecosystems of the mountain summits are considered to be remnants of much more widespread flora and fauna present at lower latitudes during cooler and wetter climatic periods. Nadir-viewing, overlapping frames taken along-track was requested)*.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 8:11am EST [= epoch]):
Mean altitude -- 334.1 km

Apogee height -- 335.9 km
Perigee height -- 332.3 km
Period -- 91.21 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0002684
Solar Beta Angle -- -17.2 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.79
Mean altitude loss in the last 24 hours -- 160 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52349

Significant Events Ahead *(all dates Eastern Standard, some changes possible. NET = Not Earlier Than):*
01/11/08 -- ISS reboost (~7:42pm, SM main engine w/two thrusters)
01/24/08(NET) -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite.
01/31/08 -- **Explorer-1 50 Years (1st U.S. Satellite on Redstone rocket)** *[see http://usspace50.com]*
02/06/08 -- Progress M-62/27P undocking & reentry
02/07/08 -- Progress M-63/28P launch
02/09/08 -- Progress M-63/28P docking (DC1)
02/22/08(NET) -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana)
02/14/08 -- STS-123/Endeavour/1J/A launch/1J/A, ~11:53am, w/SLP-SPDM, JEM ELM-PS
02/16/08 -- STS-123/Endeavour/1J/A docking
02/27/08 -- STS-123/Endeavour undocking
02/29/08 -- STS-123/Endeavour landing
03/06/08 -- ATV-1 Demo Day 1
03/12/08 -- ATV-1 Demo Day 2
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch

09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/06/08 -- STS-119/Discovery/15A launch – S6 truss segment
11/08/08 -- STS-119/Discovery/15A docking
11/17/08 -- STS-119/Discovery/15A undocking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
11/28/08 -- Progress M-67/32P docking (SM aft port)
04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/09/08
Date:	Wednesday, January 09, 2008 12:35:38 PM
Attachments:	

ISS On-Orbit Status 01/09/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Whitson & FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

The FE-2 worked in the Airlock (A/L), startingt on a lengthy (2h 25m) troubleshooting procedure on the EACP (EVA/EMU Audio Control Panel), first setting up comm from the A/L, then activating the EACP and connecting it via the "low clearance" Y-cable to ATU-4 (Audio Terminal Unit, #4) and ATU-6 on the A/L Avionics Rack. After initial testing, the EACP was turned off again. *[ATU-6 was installed by Clay Anderson on 10/11/07 in place of a failed unit, and the failed ATU-6 was returned on 10A. The new ATU-6 has been experiencing periodic lockups and PBIT (passive built-in test) faults. Engineering analysis and testing indicate that these issues may be caused by improperly mated J3 & J4 connections, a problem with the address connector, or a dirty fiber-optic connector. There are 3 ATUs in the A/L, one of which must be functional for EVAs, so long as the suited EVA crew has established UHF (Ultra High Frequency) radio communication.]*

In the DC1 Docking Module, with temporary comm link established, FE-1 Malenchenko terminated discharging the first Orlan 825M3 battery pack and started discharging pack #2 (of three).

Yuri then continued his three-day maintenance on the three Russian Orlan-M spacesuits #25, #26 & #27 in DC1, today performing spacesuit and BSS (Orlan Interface Unit) leak and valve tests, including a hermeticity check on the Orlan #25 backup bladder. The activity was supported by specialist tagup.

At ~3:20am EST, the FE-1 supported the ground's reactivation of the Elektron O_2 generator at 32 amps by monitoring the external temperature of its secondary purification unit (BD) for the first 10 minutes of operations to ensure that there is no overheating. *[During nominal operations a gas analyzer is utilized to detect hydrogen (H_2) in the O_2 line (which could cause overheating) but is not included in the control algorithm until 10 minutes after Elektron startup.]*

Malenchenko also continued the extended leak checking of the spare BZh Liquid Unit (#056) for the Elektron O_2 generator by checking the unit's pressure and charging it once again with pressurized N_2 from the BPA-M Nitrogen Purge Unit (#23) to 1 atm (1 kg/cm^2). The last test pressurization was on 12/13/07. *[During Elektron operation, the inert gas locked up in the BZh has the purpose to prevent dangerous O_2/H_2 mixing. A leaking BZh cannot be used.]*

CDR Whitson powered up the MSG (Microgravity Science Glovebox) and conducted another InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) experiment run (#3), then exchanged the vial assembly. MSG was powered down afterwards. *[After MSG and InSPACE & InSPACE-2 equipment activation, Peggy checked on alignment & focusing of the two MSG video cams, switched the magnetic field between runs, changed out video recorder tapes and later deactivated InSPACE & MSG. InSPACE, conducted last in June 2006 by Jeff Williams on Increment 13, obtains basic data on magnetorheological (MR) fluids, i.e., a new class of "smart materials" that can be used to improve or develop new brake systems, seat suspensions robotics, clutches, airplane landing gear, and vibration damper systems. The dispersed MR fluid particles are contained in CAs (Coil Assemblies) inside small precision rectangular borosilicate glass vials in the MSG. The CAs subject them to pulsed electromagnetic fields of certain strength and frequencies.]*

FE-2 Tani conducted periodic coolant sampling on the Node-2 ITCS MTL (Internal Thermal Control System/Moderate Temperature Loop) by adjusting its fluid sampling adapter metering valve and then taking a fluid sample for OPA (Ortho-Phthalaldehyde) testing (with test strips). The sampling process for OPA was then repeated on the LTL (Low Temperature Loop) side of the Node-2 ITCS and subsequently also on the MTL loop of the Lab ITCS. *[OPA, an antimicrobial agent, was introduced into the Lab ITCS coolant by the AmiA (Antimicrobial*

Applicator), before the AmiA was removed again on 11/2 by Clay Anderson for Earth return.]

Yuri Malenchenko prepared for today's first day of a new five-day wearing test of the spring-loaded "Penguin-3" antigravity pressure/stress suit with its load measuring system (SIN), donning the suit and its equipment, then going about his business and downloading performance measurements several times. *[During each of the five days, Yuri selects higher symmetrical (shoulders) & asymmetrical (chest & back) loads (~20-30 kgf), after calibrating the system with no load on the suit's internal tension straps. Performance/body motion data are then collected by the SIN electronics (via analog-to-digital converters) and downloaded to an A31p laptop three times daily, followed by downlink to the ground via BSR-TM.]*

Dan Tani performed his daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 photo support). *[The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour.]*

Later, Tani undertook the monthly FDS PEP (Fire Detection & Suppression/ Portable Emergency Provisions) safety inspection/audit. *[The IMS (Inventory Management System)-supported inspection involves verification that PFEs (portable fire extinguishers), PBAs (portable breathing apparatus), QDMAs (quick-don mask assemblies) and EHTKs (extension hose/tee kits) are free of damage to ensure their functionality, and to track shelf life/life cycles on the hardware (QDMA harness inspection was not required this time). In the USOS, there are a total of 5 PFEs and 7 PBAs, plus 7 QDMAs and 4 EHTKs.]*

For upcoming activities with the new Russian KPT-2 science payload BAR-RM (a cabin leakage detection experiment starting tomorrow), Malenchenko reinstalled the previous software (v1.2) from DVD-ROM on the RSE1 laptop (which does not have a second hard drive).

Yuri performed his routine servicing of the ESA/Energia experiment ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS), downlinking accumulated AST spectrometer data. *[The FE-1 checked the spectrometer's PCMCIA memory card (#938) in the AST slot and #941 and ascertained their file quantities and sizes in the RSK1 laptop. ALTCRISS uses the AST spectrometer employed by VC8 guest cosmonaut Roberto Vittori in 2005 in the DC1 for the Italian LAZIO (Low Altitude Zone/Ionization Observatory) experiment.]*

Using the SKDS CMS (Pressure Control & Atmosphere Monitoring System/ Countermeasure System), the FE-1 took the periodic readings of potentially harmful contaminants in the SM. The hardware was then returned to initial stowage. *[The CMS uses preprogrammed microchips to measure Formaldehyde (H_2CO, methanal), Carbon Monoxide (CO) and Ammonia (NH_3), taking one measurement per microchip.]*

Dan serviced the prime CSA-CP (Compound Specific Analyzer-Combustion Products) unit, replacing its battery with a fresh one.

Yuri completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables, the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP.

The FE-1 also conducted the daily 20-min. IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Peggy Whitson performed a major outfitting job on the Node-1 overhead hatch (forward) to the Z1 Dome by installing an NPRV (Negative Pressure Relief Valve) to protect the hatch from "burping" during depressurizations. *[A hatch door "burps" when it temporarily flexes and unseats due to pressure differential acting in the "wrong" direction, i.e., opposite to pressing the door down on its seal. For the installation, Peggy had to remove the RED (Resistive Exercise Device) mounted on the Node "ceiling", install the NPRV, inspect the hatch seal and reinstall the RED.]*

Malenchenko worked on the RBO-3-2 radiation payload suite "Matryoshka-R", conducting the periodic collection and logging of accumulated data of seven Matryoshka-R Bubble Dosimeter detectors installed previously at various exposure locations in the RS (Russian Segment), using the special Bubble Dosimeter Reader. *[The complex Matryoshka payload suite is designed for sophisticated radiation studies. Three detectors now in use are positioned in spherical "Phantom" containers in the DC1, four in the stbd crew cabin, under the work table, and behind a panel (#327).]*

Today at sleeptime, Yuri will start another data take with the Russian MBI-12 SONOKARD (Sonocard) experiment, his seventh. *[During sleep, Yuri will wear a shirt with the special SONOKARD device in the shirt pocket. The objectives of the experiment are stated to (1) study the feasibility of obtaining the maximum of data*

through computer processing of records obtained overnight, (2) systematically record the crewmember's physiological functions during sleep, (3) study the feasibility of obtaining real-time crew health data. Investigators believe that contactless acquisition of cardiorespiratory data over the night period could serve as a basis for developing efficient criteria for evaluating and predicting adaptive capability of human body in long-duration space flight.]

The crewmembers performed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Dan copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

The FE-2 went on a narrated video "tour" of the ISS compartments with a Sony PD100 camcorder, paying special attention to radial port stowage in both Nodes for fireport evaluation, for subsequent downlink to MCC-Houston. (Last time done by Suni Williams on 5/8/07). *[The footage provides valuable situational insight in the current configuration of the station interior, including general stowage configuration and fireport observation (clearance), for the FCT (Flight Control Team) and will also be used for upcoming Expedition and Shuttle crews for pre-flight "handover" training.]*

At ~9:00am EST, the crew downlinked two PAO TV messages of greetings for later replay, one at the 50th anniversary race of the Daytona "500" in February, the other at the dedication of the new Davidson Space Exploration Center (housing the 43-year old Saturn-V-D dynamic test vehicle) and the 50th Anniversary of Explorer 1 festivities at the USSRC in Huntsville, AL.

At ~4:00pm, Dan Tani is scheduled for a PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-9 laptop).

CEO (Crew Earth Observation) photo targets uplinked for today again were **Polar Mesospheric Clouds — *PMC*, Antarctica** *(IPY--PMC radar research station active. GMTs for this and subsequent PMC opportunities were chosen for closeness to the Antarctic PMC radar research site at 73S 13W. Radar is switched on during ISS passes at the uplinked GMTs. But the crew was to feel free to look south during any night awake pass),* and **Luquillo Forest, Puerto**

Rico *(ISS had a nadir pass over this Long Term Ecological Research [LTER] site located at the northeastern tip of Puerto Rico. One of the newer sites in the National Science Foundation's LTER Network, the Luquillo Forest represents a tropical ecosystem subject to major periodic environmental stresses such as hurricanes. Overlapping, high resolution frames taken along-track are requested to document current vegetation and land cover patterns).*

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 8:10am EST [= epoch]):
Mean altitude -- 334.2 km
Apogee height -- 335.9 km
Perigee height -- 332.6 km
Period -- 91.22 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0002481
Solar Beta Angle -- -22.1 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.79
Mean altitude loss in the last 24 hours -- 165 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52333

Significant Events Ahead *(all dates Eastern Standard, some changes possible. NET = Not Earlier Than):*
01/11/08 -- ISS reboost (~7:42pm, ~12.5 m/s, SM main engine)
01/24/08(NET) -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite.
01/31/08 -- **Explorer-1 50 Years (1st U.S. Satellite on Redstone rocket)** *[see http://usspace50.com]*
02/06/08 -- Progress M-62/27P undocking & reentry
02/07/08 -- Progress M-63/28P launch
02/09/08 -- Progress M-63/28P docking (DC1)
02/22/08(NET) -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana)
02/14/08 -- STS-123/Endeavour/1J/A launch/1J/A, ~11:53am, w/SLP-SPDM, JEM ELM-PS
02/16/08 -- STS-123/Endeavour/1J/A docking
02/27/08 -- STS-123/Endeavour undocking
02/29/08 -- STS-123/Endeavour landing
03/06/08 -- ATV-1 Demo Day 1

03/12/08 -- ATV-1 Demo Day 2
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
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09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
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04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/08/08
Date:	Tuesday, January 08, 2008 1:32:33 PM
Attachments:	

ISS On-Orbit Status 01/08/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Whitson & FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Working in the DC1 Docking Compartment, FE-1 Malenchenko, later joined by CDR Whitson, started a three-day maintenance activity on three Russian Orlan-M spacesuits (#25, #26, #27), first initiating discharge of 825M3 Orlan battery pack #1, then scrubbing and degassing the Orlan water loops, followed by the coolant loops in the DC1 and SM PkhO (Service Module Transfer Compartment) BSS Orlan Interface Units. *[Functional inspection & checkout of the suits and their spare parts, including bladder leak tests, are scheduled tomorrow & Thursday.]*

FE-2 Tani undertook the monthly (Week 11) potable water sampling for microbial inflight and post-flight chemical analysis, using jointly approved Russian sampling procedures with the U.S. WS&A (Water Sampler & Archiver) kit for collection. Later, Dan performed the in-flight analysis using the WMK (Water Microbiology Kit) and its MCDs (Microbial Capture Devices) for coliform detection. *[Three samples (225 mL each) were taken in the SM -- at the potable water SRV-K hot port, SRV-K warm port & SVO-ZV tap for inflight analysis, plus two chemical post-flight samples (750 mL) for return on 1E from SRV-K warm & SVO-ZV. Note: Flush water is being reclaimed by mopping it up with towels which are then hung up in the Russian*

segment (RS) for evaporation, collection and condensation in the SKV2 air conditioner, thus reducing the amount of water to be transferred from the Lab CCAA (Common Cabin Air Assembly) condensate tank to the RS for "Elektron" processing (demineralizing).]

The FE-1 serviced the SM's ASU toilet facilities systems/replaceables, performing the periodic replacement of the toilet's urine receptacle (M-P) and filter insert (F-V), plus associated hoses and a sensor, and stowing the old units for disposal.

The FE-2 performed his daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 photo support). *[The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour.]*

In the SM, Malenchenko conducted his second periodic repositioning of the ESA/ RSC-Energia experiment ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS) by rotating its AST spectrometer 90 deg in its place to face in another direction, then swapping the AST's PCMCIA (Portable Computer Memory Card International Adapter) storage card #941 with #938. The activity was photo-recorded, with imagery downlinked afterwards. *[ALTCRISS uses the AST spectrometer to monitor space radiation at different points in the RS.]*

Later, Yuri completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM, including ASU toilet facilities systems/replaceables, the weekly collection of the toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP.

Working off his voluntary "time permitting" task list, the FE-1 also conducted the daily 20-min. IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

At ~11:55am EST, Peggy Whitson conducted a teleconference with ground specialists on her upcoming R&R (Removal & Replacement) of a suspect ITCS (Internal Thermal Control System) pressure relief valve in EXPRESS Rack 1 (ER1). *[A fluid leak in ER1 was identified in late 2005, and the valve is the most likely suspect. The rack's anomaly has significantly impacted the science community. A spare valve was delivered on 12A.1. The suspect valve was not designed as an ORU (Orbital Replacement Unit), but its R&R can restore full*

functionality to the rack. The IFM (Inflight Maintenance) is scheduled on 1/10 (Thursday) for several hours, and the valve will be inspected for leaks; if none are found, the hardware will be reinstalled. ER1, with 8 lockers and 2 drawers, containing SAMS (Space Accelerations Measuring System) & MAMS (Microgravity Accelerations Measuring System), has been inactive since 1/2.]

Dan Tani conducted the periodic (every two weeks) 15-min inspection of the RED (Resistive Exercise Device) canister cords and accessory straps as well as the canister bolts for re-tightening if required.

The crewmembers performed their regular 2.5-hr. physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Dan copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

With the Russian O_2 (oxygen) generator "Elektron" turned off since 12/28/07, the FE-1 had time set aside for another 1-hour O_2 repress of the cabin atmosphere from Progress M-62/27P storage tankage, if required. Yesterday's repress added about 8 mmHg of O_2 into the ISS as per plan. *[The Elektron will remain powered down until 1/9/08 to conserve hardware lifetime. During this time, the station will be periodically repressurized with oxygen from Progress 27P.]*

As a new item added to her discretionary "job jar" task list, CDR Whitson is to take the Sony PD100 camcorder on another narrated video "tour" of the ISS compartments, with special attention to radial port stowage in both Nodes for fireport evaluation, for subsequent downlink to MCC-Houston. (Last time done by Suni Williams on 5/8/07). *[The footage provides valuable situational insight in the current configuration of the station interior, including general stowage configuration and fireport observation (clearance), for the FCT (Flight Control Team) and will also be used for upcoming Expedition and Shuttle crews for pre-flight "handover" training.]*

Weekend Voluntary Science: For the next voluntary "Saturday Science" program on 1/12, Peggy was offered, for her acceptance, two experiment runs with the InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) payload in the MSG (Microgravity Science Glovebox).

CEO (Crew Earth Observation) photo targets uplinked for today again were **Polar Mesospheric Clouds — *PMC*, Antarctica** *(IPY--PMC radar research station active. GMTs for this and subsequent PMC opportunities were chosen for closeness to the Antarctic PMC radar research site at 73S 13W. Radar is switched on during ISS passes at the uplinked GMTs. But the crew was to feel free to look south during any night awake pass),* **Tigris-Euphrates Delta, Persian Gulf** *(looking to the right of track for the Tigris-Euphrates delta region. Like other deltas around the world, land use change in the region is affecting the existing ecosystems and hydrologic processes. Imagery of the coastline is requested to track these changes),* **Somalia Coast, Africa** *(weather was predicted to be clear over the Somalia coast for high resolution photography of existing land cover and land use. Nadir images of the coast, acquired along-track, were requested),* and **Volcano Colima, Mexico** *(a Decade Volcano, Colima is considered to be one of the most potentially hazardous due to human settlement in the region. Looking to the right of track for the volcano, distinctive because of two peaks. Near-nadir mapping of the summit and flanks of the cone is requested. This imagery is useful for identifying changes in vegetation density or slope material movement).*

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 9:00am EST [= epoch]):
Mean altitude -- 334.4 km
Apogee height -- 336.0 km
Perigee height -- 332.8 km
Period -- 91.22 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0002426
Solar Beta Angle -- -27.0 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.78
Mean altitude loss in the last 24 hours -- 189 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52318

Significant Events Ahead *(all dates Eastern Standard, some changes possible. NET = Not Earlier Than):*
01/11/08 -- ISS reboost (~7:42pm, ~12.5 m/s, SM main engine)
01/24/08(NET) -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite.

01/31/08 -- **Explorer-1 50 Years (1st U.S. Satellite on Redstone rocket)** *[see http://usspace50.com]*
02/06/08 -- Progress M-62/27P undocking & reentry
02/07/08 -- Progress M-63/28P launch
02/09/08 -- Progress M-63/28P docking (DC1)
02/22/08(NET) -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana)
02/14/08 -- STS-123/Endeavour/1J/A launch/1J/A, ~11:53am, w/SLP-SPDM, JEM ELM-PS
02/16/08 -- STS-123/Endeavour/1J/A docking
02/27/08 -- STS-123/Endeavour undocking
02/29/08 -- STS-123/Endeavour landing
03/06/08 -- ATV-1 Demo Day 1
03/12/08 -- ATV-1 Demo Day 2
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
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11/20/08 -- **ISS 10 Years**

11/26/08 -- Progress M-67/32P launch
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/07/08
Date:	Monday, January 07, 2008 12:40:23 PM
Attachments:	

ISS On-Orbit Status 01/07/08

All ISS systems continue to function nominally, except those noted previously or below. *Russian Orthodox Christmas, a holiday also for ISS. Ahead: Week 12 of Increment 16.*

S Rodzhestvom Kristovym!

CDR Whitson & FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

At ~5:00am EST, FE-1 Malenchenko received a 10-min VIP call via S-band from Patriarch Alexis II of the Russian Orthodox Church, speaking from TsUP/Moscow and extending best wishes to the crew on the occasion of today's Orthodox Christmas celebration. *[The Russian Orthodox Church celebrates its Christmas 13 days after Western Christmas, on January 7, in accordance with the old Julian calendar. It is a day of both solemn ritual and joyous celebration. Christmas was banned throughout Russia after the 1917 Revolution, along with other religious celebrations, and it wasn't until 75 years later, in 1992, that the holiday was again openly observed. Today, it's once again celebrated in grand fashion, with citizens participating in an all-night Mass in incense-filled Cathedrals amidst the company of the painted icons of Saints, along with a traditional family get-together and special meal on Christmas Eve.]*

Later, Yuri completed today's routine maintenance of the SOZh system (Environment Control & Life Support System, ECLSS) in the Service Module (SM), including ASU toilet facilities systems/replaceables, the weekly collection of the

toilet flush (SP) counter and water supply (SVO) readings for calldown to TsUP.

The crewmembers performed their regular 2.5-hr physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR, FE-1), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Peggy Whitson copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

With the Russian O_2 (oxygen) generator "Elektron" turned off since 12/28/07, the FE-1 had time set aside for another 1-hour O_2 repress of the cabin atmosphere from Progress M-62/27P storage tankage, if required. Yesterday's repress added about 8 mmHg of O_2 into the ISS as per plan. *[The Elektron will remain powered down until 1/9/08 to conserve hardware lifetime. During this time, the station will be periodically repressurized with oxygen from Progress 27P.]*

A new entry still on discretionary US "job jar" task list for Peggy and Yuri is "ghosting" an updated personal image with their preferred material on a 60GB hard disk in an A31p laptop UltraBay Adapter reserved as their CPSD (Crew Personal Support Disk), a 45-min task for each.

Also on Whitson's voluntary task list, at her convenience, is an audit of rack locations, using the IMS (Inventory Management System). *[The audit function, introduced with the implementation of IMS software version 2.0, allows the crewmember to set up audits of bags, kits, containers and stowage locations on the laptop.]*

A third new item on the "job jar" task list is for FE-2 Tani to continue his crew departure preparations.

The two flight engineers were scheduled for PFCs (Private Family Conferences) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-9 laptop), Yuri at ~6:20am EST, Dan at ~11:50am.

No CEO photo targets uplinked for today.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are

downloaded by the public each month from this “Gateway” site);
http://earthobservatory.nasa.gov/
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ISS Orbit (as of this morning, 8:39am EST [= epoch]):
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/06/08
Date:	Sunday, January 06, 2008 11:52:44 AM
Attachments:	

ISS On-Orbit Status 01/06/08

All ISS systems continue to function nominally, except those noted previously or below. *Sunday -- off-duty day for CDR Whitson, FE-1 Malenchenko and FE-2 Tani (congrats, Dan, to the nice write-up about you and your mom in today's Washington Post!). Ahead: Week 12 of Increment 16. Also: Christmas Eve for tomorrow's Russian Orthodox Christmas.*

CDR Whitson & FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Upon wakeup, Dan Tani also performed the last sampling of his session with the NASA/JSC experiment NUTRITION w/Repository, collecting a final urine sample for storage in the MELFI (Minus-Eighty Laboratory Freezer for ISS), Dewar 2, Tray A/2-3. The sampling kit was then stowed away. *[The current NUTRITION project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R +30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

After Houston Flight Controllers started deactivating the CDRA (Carbon Dioxide Removal Assembly) early this morning (1:40-6:40am) and cooling was no longer

required, the FE-2 disconnected the ITCS LTL QD (Internal Thermal Control System/Low Temperature Loop/Quick Disconnect) jumper to the CDRA rack (LAB1D6).

With the Russian O_2 (oxygen) generator “Elektron” turned off since 12/28/07, Yuri had time set aside for another 1-hour O_2 repress of the cabin atmosphere from Progress M-62/27P storage tankage, if required. *[The Elektron will remain powered down until 1/9/08 to conserve hardware lifetime. During this time, the station will be periodically repressurized with oxygen from Progress 27P.]*

FE-2 Tani performed his daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 photo support). *[The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour. Special uplink to Dan this morning: “The BCAT team downloaded the new images and reports that they look fabulous. The team is very excited and looking forward to pressing ahead and making more progress in coming days.”]*

FE-1 Malenchenko meanwhile conducted the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers. Weekly SOZh reports (on Sundays) to TsUP/Moscow deal with number & dates of water and urine containers, counter readings of water consumption & urine collection, and total operating time of the POTOK air filtration system.]*

Working off his “time permitting” discretionary task list, Yuri conducted his fifth run of the Russian DZZ-2 "Diatomeya" ocean observations program, using the NIKON-F5 still camera with 80-200 mm Nikkor zoom lens and the SONY PD-150O camcorder to record color contrasts on water surface and irregular cloud cover pattern in the World Ocean target areas. *[Uplinked target zones in the Atlantic Ocean were the Great Banks, the commercial-production area of the Western Sahara, the US coastal area of the Agulhas subsea table (RSA), the Gulf of Mexico with the Caribbean Sea and the Venezuelan coast.]*

A second job item on the FE-1’s discretionary list for today was another KPT-3 session to make observations and take aerial KPT-3 photography of environmental conditions for Russia's Environmental Safety Agency (ECON) using the Nikon D2X

digital camera with SIGMA 300-800mm telephoto lens. *[Targets today were contamination areas in the Seattle area and in the Pacific Ocean.]*

A new entry added to the discretionary US "job jar" task list for Peggy and Yuri is "ghosting" an updated personal image with their preferred material on an 60GB hard disk in an A31p laptop UltraBay Adapter reserved as their CPSD (Crew Personal Support Disk), a 45-min task for each.

Also on Whitson's voluntary task lit, at her convenience, is an audit of rack locations, using the IMS (Inventory Management System). *[The audit function, introduced with the implementation of IMS software version 2.0, allows the crewmember to set up audits of bags, kits, containers and stowage locations on the laptop.]*

Another newly added item on the "job jar" task list is for FE-02 Tani to continue his crew departure preparations.

The crewmembers performed their regular 2.5-hr physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (FE-2), TVIS treadmill (CDR , FE-1), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Tani and Whitson had their weekly PFCs (Private Family Conferences) via S-band/ audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-9 laptop), Dan at ~9:20am EST, Peggy at ~10:55am.

No CEO photo targets uplinked for today.

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 8:25am EST [= epoch]):
Mean altitude -- 334.8 km
Apogee height -- 336.4 km
Perigee height -- 333.2 km
Period -- 91.23 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0002355

Solar Beta Angle -- -36.8 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.78
Mean altitude loss in the last 24 hours -- 198 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52286

Significant Events Ahead *(all dates Eastern Standard, some changes possible. NET = Not Earlier Than):*
01/11/08 -- ISS reboost (~7:42pm)
01/24/08(NET) -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite.
01/31/08 -- **Explorer-1 50 Years (1st U.S. Satellite on Redstone rocket)** *[see http://usspace50.com]*
02/06/08 -- Progress M-62/27P undocking & reentry
02/07/08 -- Progress M-63/28P launch
02/09/08 -- Progress M-63/28P docking (DC1)
02/22/08(NET) -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana)
02/14/08 -- STS-123/Endeavour/1J/A launch/1J/A, ~11:53am, w/SLP-SPDM, JEM ELM-PS
02/16/08 -- STS-123/Endeavour/1J/A docking
02/27/08 -- STS-123/Endeavour undocking
02/29/08 -- STS-123/Endeavour landing
03/06/08 -- ATV-1 Demo Day 1
03/12/08 -- ATV-1 Demo Day 2
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**

10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/06/08 -- STS-119/Discovery/15A launch – S6 truss segment
11/08/08 -- STS-119/Discovery/15A docking
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11/28/08 -- Progress M-67/32P docking (SM aft port)
04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/05/08
Date:	Saturday, January 05, 2008 1:42:10 PM
Attachments:	

ISS On-Orbit Status 01/05/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Whitson & FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

The crew performed the regular weekly three-hour task of thorough station cleaning. *["Uborka", usually done on Saturdays, includes removal of food waste products, cleaning of compartments with vacuum cleaner, damp cleaning of the Service Module (SM) dining table, other frequently touched surfaces and surfaces where trash is collected, as well as the FE's sleep station with a standard cleaning solution; also, fan screens and grilles are cleaned to avoid temperature rises. Special cleaning is also done every 90 days on the HEPA (high-efficiency particulate air) bacteria filters in the Lab.]*

As part of the house cleaning, FE-1 Yuri Malenchenko performed preventive maintenance cleaning on the FS5, FS6, VPkhO, VdPrK, VPrK & TsV2 fan grilles in the DC1 Docking Module and FGB *(Funktsionalnyi-Grusovoi Blok)*.

For today's VolSci (Voluntary Weekend Science) program, Dan Tani completed an all-day session with the NASA/JSC experiment NUTRITION w/Repository, starting with the 24-hour urine collections at wakeup, to continue through tomorrow morning. Peggy Whitson also collected & processed blood samples from Dan. The

samples were consecutively stored in the MELFI (Minus-Eighty Laboratory Freezer for ISS). *[The current NUTRITION/Repository project is the most comprehensive in-flight study done by NASA to date of human physiologic changes during long-duration space flight. It includes measures of bone metabolism, oxidative damage, nutritional assessments, and hormonal changes, expanding the previous Clinical Nutritional Assessment profile (MR016L) testing in three ways: Addition of in-flight blood & urine collection (made possible by MELFI), normative markers of nutritional assessment, and a return session plus 30-day (R+30) session to allow evaluation of post-flight nutrition and implications for rehabilitation.]*

For her VolSci part, CDR Whitson worked with the MSG (Microgravity Science Glovebox) and the InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) experiment. *[After activation of MSG and InSPACE & InSPACE-2 equipment, Peggy checked on alignment & focusing of the two MSG video cams, switched the magnetic field, changed out video recorder tapes and later deactivated InSPACE & MSG. InSPACE, conducted last in June 2006 by Jeff Williams on Increment 13, obtains basic data on magnetorheological fluids, i.e., a new class of "smart materials" that can be used to improve or develop new brake systems, seat suspensions robotics, clutches, airplane landing gear, and vibration damper systems. The dispersed particles are contained in CAs (Coil Assemblies) in the MSG that subject them to electric fields of certain strength and frequencies.]*

The FE-1 meanwhile performed the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers. Weekly SOZh reports (on Sundays) to TsUP/Moscow deal with number & dates of water and urine containers, counter readings of water consumption & urine collection, and total operating time of the POTOK air filtration system.]*

The FE-2 performed his daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 photo support). *[The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour. Special uplink to Dan this morning: “The BCAT team downloaded the new images and reports that they look fabulous. The team is very excited and looking forward to pressing ahead and making more progress in coming days.”]*

With the Russian O_2 (oxygen) generator “Elektron” turned off since 12/28/07, Yuri had time reserved for another 1-hour O_2 repress of the cabin atmosphere from Progress M-62/27P storage tankage, if required. Yesterday’s repress added about 8 mmHg of O_2 into the ISS as per plan. *[The Elektron will remain powered down until 1/9/08 to conserve hardware lifetime. During this time, the station will be periodically repressurized with oxygen from Progress 27P.]*

The crewmembers performed their regular 2.5-hr physical workout program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR), TVIS treadmill (FE-1, FE-2), RED (CDR, FE-2) and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Peggy copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

Working off his voluntary “time available” task list, Yuri took photographs of the externally installed SKK-9/SM and SKK-2/DC1 replaceable materials exposure experiments. *[SKK-9 was to be photographed through the DC1 EVA hatch window, SKK-2 from the SM window #6.]*

A second job item on the FE-1’s discretionary list for today was another KPT-3 session to make observations and take aerial KPT-3 photography of environmental conditions for Russia's Environmental Safety Agency (ECON) using the Nikon D2X digital camera with SIGMA 300-800mm telephoto lens. *[Targets today were contamination areas in the Seattle area and in the Pacific Ocean.]*

At ~7:45am EST, Yuri participated in an interview by journalist Ekaterina Beloglazova, a correspondent of Rossiyskiy Kosmos Magazine, responding to questions uplinked beforehand. *[“We know that because of the Shuttle launch delay your program underwent some changes. What kind of experiments, operations and observations did you perform? What are your impressions and do you have some interesting results?”; “Tell us about the new European module Columbus.”; “How much is this expedition different from your past missions?”; “Tell us about your colleagues, your work, your relations, your habits. What is your daily schedule, where do you live, what do you like, how do you spend your free time, etc.?”]*

At ~9:10am EST, the crewmembers held their regular weekly planning conference (WPC) with the ground, discussing next week's "Look-Ahead Plan" (prepared jointly

by MCC-H and TsUP/Moscow timeline planners) via S-band/audio, reviewing the monthly calendar, upcoming activities, and any concerns about future on-orbit events.

At ~9:40am, the FE-1 had his weekly PFC (Private Family Conference) via S-band/audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-9 laptop).
The crew worked out in their regular 2.5-hr. physical exercise program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exerciser (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

SKV2 Update: After the recent successful SKV2 air conditioner reactivation, Malenchenko on 1/3 found condensate water behind some SM panels (405, 407, 409, etc). Cause of the overflow was determined to be a faulty "full" indicator pressure sensor inside the SBK condensate collection tank which failed to shut down the NOK2 condensate pump. After SKV2 deactivation by TsUP, Yuri replaced the tank with a new spare, reactivated the air conditioner and mopped up the water spills. *[SBK has 9 l water capacity and contains an absorptive material inside the tank. There are 6 spares remaining on board. These SBK tanks typically last 1 to 2 years.]*

Weekly Science Update (Expedition Sixteen -- Week 11)

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): FE-1 performed the exchange of memory card on 12/27. Radiation measurements continue nominally in the PIRS module. Next activities (rotation of the ALTEINO instrument, replacement of memory card and downlink) are currently scheduled on 1/8 and 1/9.

ANITA: Completed.

BCAT (Binary Colloidal Alloy Test): Reserve.

CARDIOCOG-2: Completed.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): "Dan, we are waiting to get the new launch date so we can schedule your second in-flight session to meet the R-21 to R-14 requirement. This activity will be hard scheduled when we get a firm launch date."

CFE (Capillary Flow Experiment): Reserve.

CSI-2/CGBA (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus): In progress.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): In progress.

EarthKAM (Earth Knowledge Acquired by Middle School Students): Complete.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): ELITE IMU check-out was successful. The ground received good health & status data and could send commands to the payload. The payload reply was nominal and at the end the payload was shut down via ground command.

EPO (Educational Payload Operations): Reserve.

ETD (Eye Tracking Device): In progress.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): "InSPACE-2 setup was completed on 1/4 and we were correctly configured for today's (1/5) first run. The crew provided us with different video views and close-ups of the hardware setup to help us assess the hardware on the ground."

Integrated Immune: In progress.

KUBIK-FM1/ KUBIK-FM2 Centrifuge/Incubators: Completed.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): "Thanks for operating LOCAD-PTS during 12/21-24. The LOCAD team is extremely grateful for your hard work in performing all the scheduled swabs (and more!) and excited about the results. To give you some feedback, here's a brief summary. Dan performed a valuable survey of 12 different sites on ISS during his two sessions. The sites he chose were excellent, and just what we were looking for based on the criteria sent up before the sessions. Some of these sites gave much higher endotoxin readings (e.g. OFFSU bathroom mirror 3.07 endotoxin units (EU)/ ml, SM table top 0.564 EU/ml, and CEVIS handle 0.469), than we had seen previously (maximum reading of 0.445 EU/ml out of 23 swabs performed by Suni). Peggy's session helped further our operational database for comparison of LOCAD-PTS data with that of the CHeCS SSK culture methods. From the data we have so far, the sites that Peggy analyzed look clean (i.e. low EU/ml) and it will be interesting to see what SSK culture we get from those same sites. OPERATIONAL ANOMALIES: 1. Frozen display/'temp too high' reading. We had mistakenly informed Dan that he could leave the cartridge in the reader indefinitely before

returning to retrieve the data. In actual fact, it appears the inserted cartridge caused the internal temperature of the reader to rise above the optimal 37 Celsius, to 40-43 Celsius. SOLUTION: We will note in procedures to leave the cartridge in the reader no longer than 30 minutes. 2. Air bubbles in water cartridge and during mixing/dispensing. You both worked very well through procedures to minimize air bubbles and accurately dispense 4 droplets of equal volume in the LOCAD-PTS cartridge. However, we acknowledge that air bubbles are occurring - even before use- and that they complicate dispensing. The cause of air bubbles in the water cartridges may be partly due to inadequately sealed swabbing kit bags. SOLUTIONS: Swabbing kit bags scheduled for flight 1J/A have been more thoroughly heat-sealed. We believe this will reduce the rate of evaporation and bubble formation in the water cartridge. Introduction of bubbles during mixing is difficult to avoid, but we will revisit procedures to see if we can minimize bubbles still further."

MISSE (Materials ISS Experiment): Ongoing.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC1 "Pirs".

MULTIGEN-1: MULTIGEN-1 samples will be downloaded on STS-122 (1E).

MSG-SAME (Microgravity Science Glovebox): Complete.

NOA-2 (Nitric Oxide Analyzer): Planned.

NUTRITION/REPOSITORY: "Peggy did a great job completing the FD60 Nutrition/Repository run. Blood operations were completed in record time".

PMDIS (Perceptual Motor Deficits in Space): Complete.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): Ongoing.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): "Peggy, we were able to downlink the data from your last download/initialization session and send it to the PI. She states that your data continues to look great. Thanks for the additional Sleep logging. You continue to go above and beyond the requirements and the PI greatly appreciates it. Your remaining activities off the task list include: monthly downloads, two more weeks of target sleep logging with sleep shifting, and doffing the Actiwatch." -- "Dan, we were able to downlink the data from your last download/initialization session and send it to the PI. She states that your data continues to look great. Please continue to Sleep log this week to meet the three

week requirement. We have left this activity on your task list per your suggestion. Your remaining activities off the task list include: at least one more download/ initialization session (depending on shuttle launch), one more week of sleep logging, and doffing the Actiwatch on the Shuttle."

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): In progress.

Swab (Characterization of Microorganisms & Allergens in Spacecraft): In progress.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

CEO (Crew Earth Observation): Through 1/2 the ground has received a total of 8,323 frames of ISS/CEO imagery for review and cataloging. "As our staff returns from holidays and vacations we note with delight that you continued to be an active and enthusiastic Earth observer. Over three thousand frames were acquired since mid-December including frames with times corresponding to 48 of our target requests. We will begin providing feedback on this large backlog in the coming weeks. We will also look at the first 225 frames with D1X and D2Xs cameras and give you an assessment. Your colorful, landmark photo of the São Simão Reservoir in east-central Brazil represents the 300,000th image of the Earth downlinked from the ISS. Congratulations! It will be published on NASA/GSFC's Earth Observatory website this weekend."

CEO photo targets uplinked for today again were **Ganges River Delta, Asia** *(weather was predicted to be clear over the Ganges delta area. A nadir mapping pass along-track was requested to capture the current configuration of outlet channels and vegetation patterns),* **Irrawaddy River Delta, Burma** *(clear weather was predicted to continue over the Irrawaddy River delta. A nadir mapping pass along track was requested to track changes to the outlet channels, island morphology, and vegetation patterns),* **Polar Mesospheric Clouds — PMC, Antarctic***a (IPY--PMC radar research station active. GMTs for this and PMC opportunities uplinked have been chosen for closeness to the Antarctic PMC radar research site at 73S 13W. Radar is switched on during ISS passes at the GMTs given. But the crew was to feel free to look south during any night awake pass),* and **Gulf of Fonseca, Central America** *(ISS had a nadir pass over this Central America embayment. High resolution mapping along the coastline was requested to document land cover and land use change).*

CEO photography can be viewed and studied at the websites: http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);

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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/04/08
Date:	Friday, January 04, 2008 12:18:15 PM
Attachments:	

ISS On-Orbit Status 01/04/08

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CDR Whitson & FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Also before breakfast, Peggy Whitson, Yuri Malenchenko and Dan Tani performed the periodic Russian biomedical routine assessments PZEh-MO-7/Calf Volume Measurement and PZEh-MO-8/Body Mass Measurement (5th for CDR & FE-1, 4th for FE-2), using the IM mass measurement device which Malenchenko afterwards broke down for stowage. *[Calf measurements (left leg only) are taken with the IZOG device, a custom-sewn fabric cuff that fits over the calf, using the knee and lower foot as fixed reference pints, to provide a rough index of deconditioning in zero-G and effectiveness of countermeasures. For determining body mass in zero-G, where things are weightless but not massless, the Russian IM "scales" measure the inertial forces that arise during the oscillatory motion of a mass driven by two helical metering springs with known spring constants. By measuring the time period of each oscillation of the unknown mass (the crewmember) and comparing it to the period of a known mass, the crewmember's mass is calculated by the computer and displayed.]*

Dr. Whitson activated the MSG (Microgravity Science Glovebox) via its A31p laptop and later in the day completed Part 2 of hardware setup & installation for the

InSPACE (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) experiment. *[InSPACE, conducted last in June 2006 by Jeff Williams on Increment 13, obtains basic data on magnetorheological fluids, i.e., a new class of "smart materials" that can be used to improve or develop new brake systems, seat suspensions robotics, clutches, airplane landing gear, and vibration damper systems. The dispersed particles are contained in CAs (Coil Assemblies) in the MSG that subject them to electric fields of certain strength and frequencies. For the new run, the CDR set up CA2-001, VA-001 (Vial Assembly 1), connected a fiber optics cable with its light guide tool to the CA, and inserted video tapes.]*

FE-1 Malenchenko inspected the KRIOGEM-03 refrigerator behind SM (Service Module) panel 229a and took photographs for downlink to TsUP-Moscow via BSR-TM, to check on adequacy of air vents for the unit.

FE-2 Tani had more time reserved for finishing up the CDRA (Carbon Dioxide Removal Assembly) maintenance conducted yesterday, as required. *[Yesterday's replacement work by Whitson & Tani concerned the second (#201) of the two CDRA desiccant/sorbent beds, the first bed having been replaced during Flight 12A.1 in December 2006. The expended CDRA bed #201, to be returned for refurbishment, was found to contain significant amounts of Zeolite in the air selector valve and at the outlets of both the desiccant and sorbent beds. Its replacement has a modified (updated) design that precludes the breach of Zeolite that had been causing CDRA subcomponent contamination and failure. The crew then connected the ITCS LTL (Internal Thermal Control System Low Temperature Loop) for cooling, after which CDRA was activated. Ground teams are closely monitoring the operations of the system over the next few days to verify nominal functionality. Note: During the R&R Tani reported finding a 14mm spherical fisheye camera lens in the depths of the Lab that had been missing for a long time.]*

The two flight engineers later performed outfitting in the DC1 (Docking Compartment), removing old protective guard cages from SD1-7 lighting fixtures and replacing them with new guards delivered on Progress 27P. The old guards were trashed.

In the Lab, CDR Whitson set up the NUTRITION/Repository hardware for urine and blood collections, to be conducted tomorrow by Dan Tani as part of his Voluntary Weekend Science initiative.

Afterwards, Peggy powered on the ELITE-S2 payload to allow ground verification of proper IMU (Interface Management Unit) function. Later, the CDR turned it off again (IMU can only be powered 2.2 hours per day to avoid violating an acoustic constraint). [*The Italian (ASI) experiment ELITE-S2 (Elaboratore Immagini Televisive - Space 2) is a human motion analysis facility for technological*

characterization and potential application for multifactorial movement analysis, to study the connection between brain, visualization and motion in micro-G. By recording and analyzing the three-dimensional motion of astronauts, this study should help engineers apply ergonomics into future spacecraft designs and determine the effects of weightlessness on breathing mechanisms for long-duration missions.]

Yuri Malenchenko set up new Bubble dosimeters for recording radiation traces as an additional component of the RS (Russian segment) radiation payload suite "Matryoshka-R" (RBO-3-2), initializing and deploying the detectors. *[With two new Bubble dosimeter detectors added, a total of eight were initialized in the Bubble dosimeter reader in the SM and positioned at their exposure locations, near the "Phantom" unit on the DC1 panel and in the starboard crew cabin on both sides of the MOSFET (metal oxide semiconductor field-effect transistor) dosimeter detector unit. The setup was photo-documented and also reported to TsUP via log sheet on the BSR-TM payload channel. The complex Matryoshka payload suite is designed for sophisticated radiation studies. Note: Matryoshka is the name for the traditional Russian set of nested dolls.]*

Checking up on potential spillage after his work on the SKV2 air conditioner (see below), Malenchenko had ~2 hrs scheduled for the periodic/long-term inspection of the pressure hull in the SM RO (Service Module Working Compartment), looking for any moisture, deposits, mold, corrosion and pitting behind panels 130, 134, 135, 138, 139 and underneath the TVIS treadmill. (Last time done: 11/2/07).

With about 3 hrs set aside, CDR Whitson performed outfitting on the SM ventilation system, cleaning four fans (VPO10, VPO11, VPO12, VSZP1) behind SM panels before replacing their US-made noise suppressors (blue) with Russian acoustic mufflers (white).

Dan took air samples for the periodic (weekly) atmospheric status check for ppO_2 (Partial Pressure Oxygen) and $ppCO_2$ (pp Carbon Dioxide), using the hand-held CSA-CP (Compound Specific Analyzer-Combustion Products), CSA-O_2 (CSA - Oxygen sensor) and CDMK (CO_2 Monitoring Kit). Batteries were to be replaced if necessary. *[Purpose of the 15-min activity is to trend with MCA (Major Constituents Analyzer), i.e., to correlate the hand-held readings with MCA measurements. CSA-CP sensors (and readings) employed in the SM were #1051 (22.6%) & #1044 (22.7%) & #1045 (21.8%). O_2 sensor checks used #1042 (22.2%), #1063 (22.3%), #1052 (22.1%), #1041 (22.1%). CDMK CO_2 level in Lab was 0.22% and 0.21% in the SM.]*

The FE-1 completed of the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Later, Yuri conducted the daily 20-min. IMS (Inventory Management System) maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

The FE-2 filled out the regular FFQ (Food Frequency Questionnaire), his 9th, on the MEC (Medical Equipment Computer). *[By means of these FFQs, U.S. astronauts keep a personalized log of their nutritional intake over time on special MEC software. Recorded are the amounts consumed during the past week of such food items as beverages, cereals, grains, eggs, breads, snacks, sweets, fruit, beans, soup, vegetables, dairy, fish, meat, chicken, sauces & spreads, and vitamins. At TsUP/Moscow, food specialists are currently preparing the Russian food "menu" for delivery by Progress M-63/28P next February. 28P will carry "bonus food" for Peggy and Yuri, plus about 15 kg of fresh food items (apples, grapefruit, oranges, lemons, garlic) in two containers.]*

Tani also performed the daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 photo support). *[The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour. Special uplink to Dan this morning: "The BCAT team downloaded the new images and reports that they look fabulous. The team is very excited and looking forward to pressing ahead and making more progress in coming days."]*

With the Russian oxygen (O_2) generator "Elektron" turned off since 12/28/07, Yuri had time reserved for another 1-hour O_2 repress of the cabin atmosphere from Progress M-62/27P storage tankage, if required. *[The Elektron will remain powered down until 1/9/08 to conserve hardware lifetime. During this time, the station will be periodically repressurized with oxygen from Progress 27P.]*

Dan Tani updated the three deployed Post Node-2 Warning books, in their "EVA Hazards" section, with the current new Directed Position angles of the Port SARJ (Solar Alpha Rotary Joint) for +XVV and –XVV attitude. *[From 340 deg (+XVV) &*

20 deg (-XVV) to 320 deg & 40 deg, resp.]

The CDR and FE-2 had more Progress 27P unloading & cargo transfers, as necessary, along with IMS tracking, added on their discretionary "job jar" task list.

The crew worked out in their regular 2.5-hr. physical exercise program (about half of which is used for setup & post-exercise personal hygiene) on the CEVIS cycle ergometer (CDR, FE-2), TVIS treadmill (FE-1), RED resistive exerciser (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1).

Afterwards, Dan copied the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~4:15am EST, Yuri linked up with TsUP stowage specialists via S-band to conduct the weekly IMS tagup, discussing stowage issues and equipment locations.

At ~7:20am, the crew held the regular (nominally weekly) tagup with the Russian Flight Control Team (GOGU), including Shift Flight Director (SRP), at TsUP via S-band/audio, phone-patched from Houston and Moscow.

At ~8:45am, the station residents convened for their weekly teleconference with ISS Program Management at JSC/Houston via S-band/audio.

At ~2:10pm, the crew is scheduled for their eighth weekly tagup with the Lead Flight Director at JSC/MCC-H via S-band/audio. *[S/G-2 (Space-to-Ground 2) phone patch via SSC-10 (Station Support Computer 10)]*.

SKV2 Update: After the recent troubleshooting of the Russian SKV2 air conditioner, the system continues to run nominally. With SKV1 nonfunctional since quite some time, SKV2 remains the only RS system that collects and condensates humidity from the air. The unit is slated for replacement in the May 2008 timeframe. *[In the USOS (US segment), the CCAA (Common Cabin Air Assembly) in the Lab is serving this function. Humidity level and air temperature need to be controlled carefully to prevent harmful condensation on hardware systems.]*

CEO photo targets uplinked for today again were **Lake Eyre, Australia** *(ISS orbit track got close to the northeastern shoreline of this large lake. Lake Eyre is very responsive to changes in local climate [as expressed by changes in precipitation]. Imagery of the current water levels and surrounding vegetation is requested to add to a time series for change analysis. Looking to the right of track for the Lake),* **Polar Mesospheric Clouds — PMC, Antarctica** *(IPY--PMC radar research station*

active. Uplinked GMT times for this and subsequent PMC opportunities were chosen for closeness to the Antarctic PMC radar research site at 73S 13W. Radar is switched on during the ISS passes at the given GMTs. But the crew was also to look south during any night awake pass. The usual indicators apply to this and PMC opportunities below: Looking right, well above the limb -- i.e. above the horizon, SW thru SE), and **Somalia Coast, Africa** *(weather was predicted to be clear for high resolution mapping of the Somalia coast. Baseline imagery of the coastal region is useful for later comparison of expected land cover/land use change following petroleum infrastructure development. Nadir mapping with overlapping frames, taken along track, was requested).*

CEO photography can be viewed and studied at the websites:
http://eol.jsc.nasa.gov (about 700,000 NASA digital photographs of Earth are downloaded by the public each month from this "Gateway" site);
http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 7:44am EST [= epoch]):
Mean altitude -- 335.1 km
Apogee height -- 336.6 km
Perigee height -- 333.7 km
Period -- 91.23 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0002173
Solar Beta Angle -- -46.8 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.78
Mean altitude loss in the last 24 hours -- 97 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52254

Significant Events Ahead *(all dates Eastern Standard, some changes possible. NET = Not Earlier Than):*
01/24/08(NET) -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite.
01/31/08 -- **Explorer-1 50 Years (1st U.S. Satellite on Redstone rocket)** *[Check it out at http://usspace50.com]*
02/06/08 -- Progress M-62/27P undocking & reentry
02/07/08 -- Progress M-63/28P launch
02/09/08 -- Progress M-63/28P docking (DC1)
02/22/08(NET) -- ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana)
02/14/08 -- STS-123/Endeavour/1J/A launch/1J/A, ~11:53am, w/SLP-SPDM, JEM ELM-PS
02/16/08 -- STS-123/Endeavour/1J/A docking

02/27/08 -- STS-123/Endeavour undocking
02/29/08 -- STS-123/Endeavour landing
03/06/08 -- ATV-1 Demo Day 1
03/12/08 -- ATV-1 Demo Day 2
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
04/24/08 -- STS-124/Discovery/1J launch – JEM PM "Kibo", racks, RMS
04/26/08 -- STS-124/Discovery/1J docking
05/04/08 -- STS-124/Discovery/1J undocking
05/14/08 -- Progress M-64/29P launch
05/16/08 -- Progress M-64/29P docking (DC1)
08/07/08(NET) -- ATV-1 undocking (from SM aft port)
08/12/08 -- Progress M-65/30P launch
08/14/08 -- Progress M-65/30P docking (SM aft port)
09/09/08 -- Progress M-64/29P undocking (from DC1)
09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
10/14/08 -- Soyuz TMA-13/17S docking (SM aft port)
10/23/08 -- Soyuz TMA-12/16S undocking (FGB nadir)
11/03/08 -- Soyuz TMA-13/17S relocation (from SM aft to FGB nadir)
11/06/08 -- STS-119/Discovery/15A launch – S6 truss segment
11/08/08 -- STS-119/Discovery/15A docking
11/17/08 -- STS-119/Discovery/15A undocking
11/20/08 -- **ISS 10 Years**
11/26/08 -- Progress M-67/32P launch
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04/15/09 -- **Constellation's Ares I-X Launch**
05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
04/??/10 -- STS-132/Discovery/20A – Node-3 + Cupola.

Note: The daily ISS On-Orbit Status reports can also be found at
http://www.hq.nasa.gov/osf/iss_reports/index.htm

From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/03/08
Date:	Thursday, January 03, 2008 12:50:00 PM
Attachments:	

ISS On-Orbit Status 01/03/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Whitson & FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Dr. Whitson conducted her first clinical blood analysis of the US PHS (Periodic Health Status) with Blood Labs exam. Afterwards, all PHS hardware was stowed again. *[The PHS exam, with PCBA (Portable Clinical Blood Analyzer) analysis and clinical evaluation, is guided by special software (IFEP, in-flight examination program) on the MEC (Medical Equipment Computer). While PCBA analyzes total blood composition, the blood's hematocrit is particularly measured by the Russian MO-10 protocol.]*

FE-1 Malenchenko completed the 2.5-hr Part 2 of his second onboard "Profilaktika" (MBI-8, "Countermeasures") series of preventive health maintenance fitness testing, including ECG (Electrocardiogram), blood test and subjective rating. *[Today's fitness test was performed on the TVIS treadmill in unmotorized (idle) mode, with free choice of speeds within the range permitted. The test investigates the action mechanism and efficiency of various countermeasures (currently VELO and TVIS) aimed at preventing locomotor system disorders in weightlessness. The test differs from the normal TVIS session by the use of the TEEM-100 gas analyzer (via a mask equipped with a pneumotachometer sensor), measurement of blood lactate level and subjective evaluation of physical exertion*

levels during the test. The lactate blood samples were taken twice at the end of the session, using the ACCUSPORT analyzer and REFLOTRON-4 accessories. Results were entered on a log sheet. TEEM and ECG (electrocardiograph) data were transferred to the RSE-Med laptop, also on a tape cassette (Cardiocassette-2000), and prepared for later downlink via Regul-Packet comm. Lactate levels were also called down via S-band to specialists standing by at TsUP-Moscow.]

Peggy Whitson conducted the weekly 10-min. CWC (Contingency Water Container) audit as part of on-going WDS (Water Delivery System) assessment of onboard water supplies. *[Updated "cue cards" based on the crew's water calldowns are sent up every other week. The current cue card (16-0018M), to be updated with today's data, lists 25 CWCs; ~1036.8 liters total) for the four types of water identified on board: technical water (735.4 l, for Elektron, flushing, hygiene), potable water (221.3 l), condensate water (52.8 l), waste/EMU dump and other (27.3 l). Two CWCs (#1004 & #1081, ~89 l) with potable water are off limits due to the* Wautersia *bacteria found in sample analysis, the source of which is still not understood. Impact of losing this potable CWC is negligible since there are sufficient drinking water supplies onboard. Also currently not to be used are nine CWCs with technical water (~389 l).]*

Malenchenko set up the pumping equipment and initiated (later closed out) the periodic transfer of urine from 6 EDV-U containers in the SM (Service Module) to the Rodnik BV1 tanks of Progress M-62/27P, then flushing the system with ~5 L of disinfectant solution. The emptied EDVs were then to be discarded on 27P because of their end of service life. *[Leak checks were performed successfully on 12/29-30 on the membranes (expulsion bladders) of the Progress' Rodnik BV1 & BV2 tanks.]*

Tani performed the daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 photo support). *[The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour. Special uplink to Dan this morning: "The BCAT team downloaded the new images and reports that they look fabulous. The team is very excited and looking forward to pressing ahead and making more progress in coming days."]*

With the Russian oxygen (O_2) generator "Elektron" turned off since 12/28/07, Yuri was scheduled to perform another 1-hour O_2 repress of the cabin atmosphere from Progress M-62/27P storage tankage, if required. *[The Elektron will remain*

powered down until 1/9/08 to conserve hardware lifetime. During this time, the station will be periodically repressurized with oxygen from Progress 27P.]

The two flight engineers again had several hours reserved for more Progress 27P unloading & cargo transfers, along with IMS (Inventory Management System) tracking.

Malenchenko also completed of the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM (Service Module). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Later, Yuri conducted the daily 20-min. IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

CDR Whitson got ahead on the timeline yesterday for setting up the video equipment at the MSG (Microgravity Science Glovebox) for the upcoming first session with the InSPACE (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) payload. Runs 1 & 2 are scheduled for next Saturday (1/5). *[InSPACE, conducted last in June 2006 by Jeff Williams on Increment 13, obtains basic data on magnetorheological fluids, i.e., a new class of "smart materials" that can be used to improve or develop new brake systems, seat suspensions robotics, clutches, airplane landing gear, and vibration damper systems. The dispersed particles are contained in CAs (Coil Assemblies) in the MSG that subject them to electric fields of certain strength and frequencies.]*

The crew worked out in their regular 2.5-hr. physical exercise program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-2), RED resistive exerciser (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1/MBI-8).

Afterwards, Dan Tani copied the exercise data file to the MEC laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At ~2:45am EST, Yuri Malenchenko represented the ISAS crew in downlinking (for taping and later replay) a TV message of greetings and congratulations to Alexander Fyodorovich Strekalov on the occasion of his upcoming 60th birthday. *["…Your whole life is inseparable from Russian cosmonautics… Under your expert and dynamic leadership the Experimental Machine-Building Plant is manufacturing*

and testing our most reliable space vehicles Soyuz and Progress, and the deployment of this unique facility where we all reside, the ISS, is also in progress. We are aware that currently all your energy is directed to increase the number of space vehicles manufactured at your plant. We are anxiously looking forward to these additional launches which mean that we, the cosmonauts, will be flying to space more often…"]

At ~9:55am, the crew engaged in an interactive TV PAO exchange with students, teachers and administrators of Robert L. Ford NASA Explorer School in Lynn, MA. Questions to the crew were uplinked beforehand. *["Peggy Whitson, how does it feel to be the first woman Commander of the ISS?"; "Dan Tani, how do you sleep in microgravity?"; "Yuri Malenchenko: Besides Earth, what else can you see from the ISS?"; "Peggy Whitson: How do you keep yourself clean?"; "Dan Tani: Have you gotten any taller while on your mission?"]*

BMRRM Retrieval Update: During yesterday's successful retrieval of the spare Bearing Motor Roll Ring Module (BMRRM) from PMA-3 (Pressurized Mating Adapter 3) it turned out that the Node-1 nadir CPAs (Control Panel Assemblies) did not have to be removed for clearance, which allowed the crew to get ahead in the timeline. After hatch closure, PMA-3 was depressurized using the depressurization pump, reclaiming ~12 lbm of air from PMA-3 into the ISS instead of venting it overboard. The final PMA-3 leak checks that were scheduled for today, were also successfully completed yesterday. *[BMRRM R&R EVA: probably not earlier than around end of January.]*

CEO photo targets uplinked for today again were **Dundee Ice Cap, China** *(the glaciers in this target area are prominent only on the north slopes on this east-west oriented range. ISS passed over the westernmost end of the range; the crew was asked to look to the left of track for opportunities to take context imagery of the region. The regional climate is arid, and ice persists at this latitude primarily because of the 16,500 to 17,500 ft elevations of the mountain crests. These glaciers are currently under field investigation by Ohio State University where core samples have been taken for paleo-climate studies),* **Polar Mesospheric Clouds — PMC, Antarctica** *(IPY--PMC radar research station active. GMTs for this and other PMC opportunities were chosen for closeness to the Antarctic PMC radar research site at 73S 13W. Radar was to be switched on during the ISS passes at the GMTs given),* **Karakoram, Asia** *(the crew had a nadir pass over the Karakoram, westernmost of the mountains comprising the Himalayan ranges. Numerous mountain and valley glaciers are located here. Overlapping mapping frames taken along-track are requested), PMC***, Antarctica** *(looking right and forward),* and **Mt. Kilimanjaro, Kenya** *(perhaps the most well-known volcano in Africa, Mt. Kilimanjaro is also the focus of glacial research. The ice fields at the summit of the mountain are highly responsive to changes in precipitation and serve*

as an important indicator of regional climate change. Looking to the right of track for the summit; there may have been clouds surrounding the mountain at lower elevation).

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http://earthobservatory.nasa.gov/
http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 7:32am EST [= epoch]):
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Apogee height -- 336.7 km
Perigee height -- 333.7 km
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Eccentricity -- 0.0002206
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Orbits per 24-hr. day -- 15.78
Mean altitude loss in the last 24 hours -- 90 m
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Significant Events Ahead *(all dates Eastern Standard, some changes possible. NET = Not Earlier Than):*
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[Check it out at http://usspace50.com]
02/06/08 -- Progress M-62/27P undocking & reentry
02/07/08 -- Progress M-63/28P launch
02/09/08 -- Progress M-63/28P docking (DC1)
02/22/08 – NET: ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana)
02/14/08 -- STS-123/Endeavour/1J/A launch/1J/A, ~11:53am, w/SLP-SPDM, JEM ELM-PS
02/16/08 -- STS-123/Endeavour/1J/A docking
02/27/08 -- STS-123/Endeavour undocking
02/29/08 -- STS-123/Endeavour landing
03/06/08 -- ATV-1 Demo Day 1
03/12/08 -- ATV-1 Demo Day 2
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)
04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch

04/10/08 -- Soyuz TMA-12/16S docking (DC1)
04/19/08 -- Soyuz TMA-11/15S undocking (FGB nadir port)
04/23/08 -- Soyuz TMA-12/16S relocation (from DC1 to FGB nadir port)
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04/26/08 -- STS-124/Discovery/1J docking
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08/07/08 -- NET: ATV-1 undocking (from SM aft port)
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09/10/08 -- Progress M-66/31P launch
09/12/08 -- Progress M-66/31P docking (DC1)
09/18/08 -- STS-126/Discovery/ULF2 launch – MPLM Leonardo, LMC
09/20/08 -- STS-126/Discovery/ULF2 docking
10/01/08 -- STS-126/Discovery/ULF2 undocking.
10/01/08 -- **NASA 50 Years**
10/11/08 -- Progress M-65/30P undocking (from SM aft port)
10/12/08 -- Soyuz TMA-13/17S launch
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/02/08
Date:	Wednesday, January 02, 2008 1:59:29 PM
Attachments:	

ISS On-Orbit Status 01/02/08

All ISS systems continue to function nominally, except those noted previously or below.

CDR Whitson and FE-2 Tani started out with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the SLEEP session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Peggy and Dan spent several hours getting "the broom out of the closet", i.e., accessing the PMA-3 (Pressurized Mating Adapter 3) at the Node-1 nadir port and retrieving the spare BMRMM (Bearing Motor Roll Ring Module) for its planned installation at the Stbd (right-side) 1A BGA (Beta Gimbal Assembly) on the S4 truss in an upcoming EVA, replacing the failed BMRRM. *The following steps were successfully executed to retrieve the spare part:*

- *Pressurize PMA-3 (normally kept at vacuum to avoid humidity condensation);*
- *Perform leak check on pressurized PMA-3;*
- *Open Node-1 nadir hatch;*
- *Remove Node-1 CBM CD (Common Berthing Module Center Disk) cover;*
- *Dismantle Port and Fwd CBM CPAs (Controller Panel Assemblies);*
- *Remove CBCS (Centerline Berthing Camera System);*
- *Retrieve BMRMM from its securing tethers*
- *Inspect Node-1 nadir hatch seal;*
- *Reverse all access steps (i.e., reinstall components and close hatch);*
- *Temporarily remove cargo stowed in A/L CL (Airlock Crewlock) that cannot go to vacuum, for using the depress pump to reclaim air from PMA-3;*

- *Depressurize PMA-3;*
- *After CL repress, restow cargo items back into CL;*
- *Clean up.*

FE-1 Malenchenko continued the current round of periodic preventive maintenance of RS (Russian Segment) ventilation systems, first working in the DC1 (Docking Compartment) to clean the V1 & V2 fan grilles and VD1 & VD2 air ducts, then moving to the Soyuz TMA-11/15S at the FGB nadir port to clean the screen of its BVN fan/heater assembly.

The FE-1 conducted the periodic checkout/verification of IP-1 airflow sensors in the various RS hatch openings (8) in the SM, FGB and DC1.

Yuri also completed the periodic collection of cabin air samples, i.e. by using --

- The SKDS CMS (Pressure Control & Atmosphere Monitoring System/ Countermeasure System) to take readings of potentially harmful contaminants in the SM. *[The CMS, part of the GANK-4M analyses (see below), uses preprogrammed microchips to measure Formaldehyde (H_2CO, methanal), Carbon Monoxide (CO) and Ammonia (NH_3), taking one measurement per microchip. CMS is part of the GANK-4M analysis conducted today]; and*
- The GANK-4M Real-Time Harmful Contaminant Gas Analyzer system. *[GANK tests for Methane (CH_4), Ammonia (NH_3), Carbon Monoxide (CO), Formaldehyde (HCHO), Nitrogen Oxides (NO, NO_2), Hydrogen Chloride (HCl), Hydrogen Fluoride (HF), and Hydrogen Cyanide (HCN).]*

Dr. Whitson broke out and set up the equipment for tomorrow's scheduled U.S. PHS (Periodic Health Status) with Blood Labs exam, her first clinical blood analysis. *[The task today included an electronic function test and control analysis of the blood lab equipment, viz., the PCBA (Portable Clinical Blood Analyzer) which she then stowed temporarily.]*

FE-2 Tani performed the periodic offloading of the Lab CCAA (Common Cabin Air Assembly) dehumidifier's condensate tank, filling a CWC (Contingency Water Container, #1054) with the collected water slated for processing. No samples were required this time. *[Estimated offload time before termination (leaving ~6 kg in the tank): ~40 min.]*

Malenchenko conducted the third recharging of the Motorola Iridium-9505A satellite phone brought up on Soyuz 15S, a monthly routine job. *[After retrieving it from its location in the TMA-11/15S descent module (BO) at ~11:25pm EST, Yuri initiated*

the recharging of its lithium-ion battery, monitoring the process every 10-15 minutes as it took place. Upon completion at ~12:35pm, the phone was returned inside its SSSP Iridium kit and stowed it back in the BO's operational data files (ODF) container. The satphone accompanies returning ISS crews on Soyuz reentry & landing for contingency communications with SAR (Search-and-Rescue) personnel after touchdown (e.g., after an "undershoot" ballistic reentry). The Russian-developed procedure for the monthly recharging has been approved jointly by safety officials. During the procedure, the phone is left in its fire-protective fluoroplastic bag with open flap.]

Working on the EXPRESS Rack 5 (ER5), Whitson unplugged the MSG MLC (Microgravity Science Glovebox Laptop Computer) from its LAN (Local Area Network) Ethernet connection and reset/recabled ER5 to its nominal configuration. *[Last November, Peggy had temporarily configured the MSG MLC for LAN in support of Node-2 integration.]*

After the ground-commanded deactivation of the CDRA (Carbon Dioxide Removal Assembly) at ~7:50am-12:50pm, Dan Tani disconnected the ITCS LTL QD (Internal Thermal Control System/Low Temperature Loop/Quick Disconnect) coolant jumper to the CDRA (LAB1D6) rack. *[The deactivation is for cool-down in preparation for the major R&R (Removal & Replacement) of the expended CDRA Desiccant/ Sorbent Bed #201 with a new spare, starting tomorrow. The entire IFM (Inflight Maintenance) will take two crewmembers approximately 9 hours (2h for CDRA removal from AR Rack, 5h for Bed 201 R&R, 2h for CDRA replacement in AR Rack), including removal of CDRA sock filters for inspection, cleaning and putting back in CDRA.]*

The FE-1 performed the periodic (monthly) functional closure test of the Russian Vozdukh CO_2 removal system's spare emergency vacuum valves (AVK), in the spare parts kit. *[The AVKs are critical because they close the Vozdukh's vacuum access lines in the event of a malfunction in the regular vacuum valves (BVK) or a depressurization in the Vozdukh valve panel (BOA). Access to vacuum is required to vent* CO_2 *during the regeneration of the absorbent cartridges (PP). During nominal operation, the AVK valves remain open.]*

Yuri conducted another session of the Russian "Uragan" (hurricane) earth-imaging program, using the Nikon D2X digital camera with 800 mm focal length lens. *[Targets uplinked for today were Poland, with the Wisla river and the city of Torun, monitoring oil contamination under low Sun conditions.]*

Malenchenko set up the hardware and conducted the first part of the onboard "Profilaktika" (MBI-8, "Countermeasures") preventive health maintenance fitness

test, on the VELO bicycle ergometer. Part 2, on the TVIS treadmill, is scheduled tomorrow. *[Test procedure for MBI-8, which requires workouts on the VELO and TVIS, is identical to the Russian MO-5 assessment, but in addition to the nominal procedure it uses the TEEM-100M gas analyzer with breathing mask, a blood lactate test with the ACCUSPORT analyzer and REFLOTRON-4 accessories, and a subjective evaluation of physical exertion levels during the test (using the Borg Perceived Exertion Scale, viz., 10 steps from very light over hard and very hard to maximum). Results are entered on a log sheet. TEEM and ECG (electrocardiograph) data are transferred to the RSE-Med laptop, also on a tape cassette (Cardiocassette-2000), and prepared for later downlink via Regul-Packet comm. Results are also called down to specialists standing by at TsUP.]*

With the Russian oxygen (O_2) generator "Elektron" turned off since 12/28/07, Yuri performed another 1-hour O_2 repress of the cabin atmosphere from Progress M-62/27P storage tankage. *[The Elektron will remain powered down until 1/9/08 to conserve hardware lifetime. During this time, the station will be periodically repressurized with oxygen from Progress 27P.]*

The CDR and FE-1 had about three hours set aside between them for more Progress 27P unloading & cargo transfers, along with IMS (Inventory Management System) tracking.

Later, Yuri conducted the daily 20-min. IMS maintenance, updating/editing its standard "delta file" including stowage locations, for the regular weekly automated export/import to its three databases on the ground (Houston, Moscow, Baikonur).

Malenchenko also completed of the routine servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM (Service Module). *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

Tani performed the daily status check on the BCAT-3 (Binary Colloidal Alloy Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 photo support). The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. *[The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour. Special uplink to Dan this morning: "The BCAT team downloaded the new images and reports that they look fabulous. The team is very excited and looking forward to pressing ahead and making more progress in coming days."]*

In preparation of tomorrow's first session with the InSPACE (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions) payload in the MSG (Microgravity Science Glovebox), CDR Whitson was "hard" scheduled today for a 30-min. familiarization review of descriptive material for the experiment and set-up of the video equipment at the MSG. *[InSPACE, conducted last in June 2006 by Jeff Williams on Increment 13, obtains basic data on magnetorheological fluids, i.e., a new class of "smart materials" that can be used to improve or develop new brake systems, seat suspensions robotics, clutches, airplane landing gear, and vibration damper systems. The dispersed particles are contained in CAs (Coil Assemblies) in the MSG that subject them to electric fields of certain strength and frequencies.]*

The crew worked out in their regular 2.5-hr. physical exercise program (about half of which is used for setup & post-exercise personal hygiene) on the TVIS treadmill (CDR, FE-2), RED resistive exerciser (CDR, FE-2), and VELO bike with bungee cord load trainer (FE-1/MBI-8).

Afterwards, Dan Tani copied the exercise data file to the MEC (Medical Equipment Computer) laptop for downlink, including the daily wristband HRM (Heart Rate Monitor) data of the workouts on RED, followed by their erasure on the HRM storage medium (done six times a week).

At 2:45pm EST, Peggy and Dan are scheduled to conduct the periodic VHF1 emergency communications check over NASA's VHF (Very High Frequency) stations, today at the Dryden (2:47-2:53pm) and White Sands VHF sites (2:49-2:56pm), talking with Houston/Capcom, MSFC/PAYCOM (Payload Operation & Integration Center Communicator) and Moscow/GLAVNI (TsUP Capcom) in the normal fashion via VHF radio from a handheld microphone and any of the U.S. segment ATUs (audio terminal units). *[Purpose of the test is to verify signal reception and link integrity, and to ensure minimum required link margin during emergency (no TDRS) and special events (such as a Soyuz relocation).]*

CEO photo targets uplinked for today again were **Polar Mesospheric Clouds —** (PMC - also known as noctilucent clouds) over selected ground sites (12 minutes for each). *(Southern spring is the season for relatively uncommon polar mesospheric clouds to form very high over Antarctica. PMC are being studied as part of the International Polar Year [IPY] investigation of climate change in high latitudes. PMC form in the stratosphere and higher, i.e. well above the lowest layer of the atmosphere [troposphere, or weather layer, characterized by clouds, and an orange tinge produced by brushfire smoke, smog, etc.]. The AIM satellite (Aeronomy of Ice in the Atmosphere) has recently been launched to investigate how PMC form and why they are apparently becoming thicker and brighter. ISS/CEO imagery will complement images from AIM and from the ground. The collaborating*

IPY scientist is excited to receive any images ISS may acquire. Collaborating Swedish scientists are now working at a base in Antarctica (73S 13 W) for PMC observation.)

CEO photography can be viewed and studied at the websites:
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http://earthobservatory.nasa.gov/Study/AstronautPhotography

ISS Orbit (as of this morning, 8:27am EST [= epoch]):
Mean altitude -- 335.3 km
Apogee height -- 336.6 km
Perigee height -- 334.0 km
Period -- 91.24 min.
Inclination (to Equator) -- 51.64 deg
Eccentricity -- 0.0001983
Solar Beta Angle -- -56.5 deg (magnitude decreasing)
Orbits per 24-hr. day -- 15.78
Mean altitude loss in the last 24 hours -- 89 m
Revolutions since FGB/Zarya launch (Nov. 98) -- 52223

Significant Events Ahead *(all dates Eastern Standard, some changes possible. NET = Not Earlier Than):*
TBD -- STS-122/Atlantis/1E launch -- Columbus Module, ICC-Lite.
TBD -- STS-122/Atlantis/1E docking
TBD -- STS-122/Atlantis/1E undocking
01/31/08 -- **Explorer-1 50 Years (1st U.S. Satellite on Redstone rocket)**
[Check it out at http://usspace50.com]
02/06/08 -- Progress M-62/27P undocking & reentry
02/07/08 -- Progress M-63/28P launch
02/09/08 -- Progress M-63/28P docking (DC1)
02/22/08 – NET: ATV-1 "Jules Verne" launch/Ariane V (Kourou, French Guyana)
02/14/08 -- STS-123/Endeavour/1J/A launch/1J/A, ~11:53am, w/SLP-SPDM, JEM ELM-PS
02/16/08 -- STS-123/Endeavour/1J/A docking
02/27/08 -- STS-123/Endeavour undocking
02/29/08 -- STS-123/Endeavour landing
03/06/08 -- ATV-1 Demo Day 1
03/12/08 -- ATV-1 Demo Day 2
03/15/08 -- ATV-1 Demo Day 3 & Docking (SM aft port)

04/07/08 -- Progress M-63/28P undocking (DC1) & reentry
04/08/08 -- Soyuz TMA-12/16S launch
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05/??/09 -- **Six-person crew on ISS** (following Soyuz 18S-2 docking)
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From:	vonPuttkamer, Jesco H. (HQ-CJ000)
To:	Von Puttkamer, Jesco H. (HQ-CE010);
CC:	
Subject:	ISS On-Orbit Status 01/01/08
Date:	Tuesday, January 01, 2008 11:57:54 AM
Attachments:	image001.gif image002.gif

ISS On-Orbit Status 01/01/08

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Peggy and Dan began the New Year with the daily reading of SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight) experiment data accumulated during the night, for logging and filling in questionnaire entries in the experiment's session file on the HRF-1 laptop for downlink. *[To monitor the crewmembers' sleep/wake patterns and light exposure, Dan and Peggy wear a special Actiwatch device which measures the light levels encountered by him as well as his patterns of sleep and activity throughout the Expedition. The log entries are done within 15 minutes of final awakening for seven consecutive days, as part of the crew's discretionary "job jar" task list.]*

Afterwards, the FE-2 connected the regular ITCS LTL (Internal Thermal Control System/Low Temperature Loop) coolant jumper at the LAB1D6 rack in support of the ground-commanded activation of the U.S. CDRA (Carbon Dioxide Removal Assembly) at ~5:50am EST.

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Test-3) science payload, running by itself in Node-2 since 12/13/07 (briefly interrupted for EVA-13 photo support). The status check, conducted on the last image taken by the DCS 760 digital still camera which is controlled by EarthKAM software on an A31p laptop, is to verify proper image focus and camera alignment. *[The SSC (Station Support Computer) is taking photography of the phase separation occurring in the BCAT Sample 3, with the photo flash going off every half hour. Special uplink to Dan this morning: "The BCAT team downloaded the new images and reports that they look fabulous. The team is very excited and looking forward to pressing ahead and making more progress in coming days."]*

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At ~2:10pm, Dan Tani will have a PFC (Private Family Conference), via S-band/ audio and Ku-band/MS-NetMeeting application (which displays the uplinked ground video on the SSC-10 laptop).

Weekend Voluntary Science: For the voluntary "Saturday Science" program on 1/5, Peggy and Dan were offered for their choice: (1) a session with the InSPACE-2 hardware (setup part 2 by Peggy, with Dan's assistance, else to be hard-scheduled on 1/4); (2) InSPACE-2 experiment runs 1 & 2 (for Peggy, 2h25m); and (3) NASA Biological Specimen Repository (Rep), for Dan (with possible assistance from Peggy. Objective of the Repository protocol is to develop an in-flight archive of human biological samples for future research activities to advance development of prognostics, markers, and therapeutics.) Selection is required ASAP.

Regenerative ECLS Update: Yesterday's work of installing & configuring the Regen ECLS (Regenerative Environmental Control & Life Support) modification kit #1 by Whitson & Tani was successfully completed. *[Primary objective of the activity was to pre-position cabling that will be installed once the CHeCS (Crew Health Care System) rack is moved to Lab position S4 at a later time. This procedure included rotating four racks (D1, D2, D4, P1), removing & remounting the LAB1PD1 Smoke Detector, and relocation of the OGS WDS (Oxygen Generation System/Water Delivery System.]*

Russian SKV-2 Air Conditioner Update: Malenchenko's intense efforts over the weekend to clean the SMOK condensate removal lines in the STR (Thermal Control System) for the SKV air conditioners of the "rubbery, jelly-like" substance found on 12/27/07 were successful. SKV-2 was reactivated on 12/30 (Sunday) and has been running nominally since then. *[SKV-2 troubleshooting began after SKV-2 and the SRVK condensate processing unit in the RS shut down on 12/23/07. SRVK and SKV-2 both remain operational, but were temporarily deactivated. SKV-1 has been inoperable for some time.]*

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