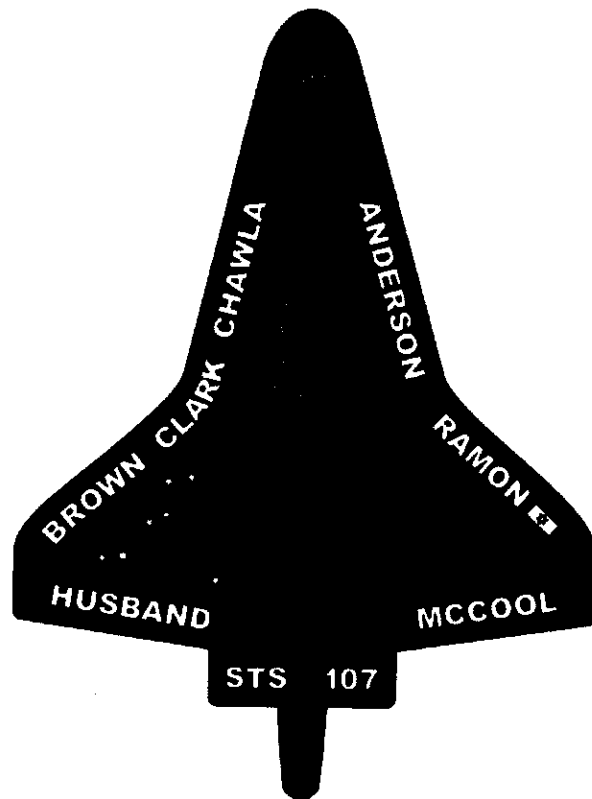


NASA

SECTION 25

STS-107 Flight Readiness Review

January 9, 2003



**STS-107
Flight Readiness Review
January 9, 2003**

Agenda

Introduction	Manager, Launch Integration
Mission Operations	Director, Mission Operations APM, Flight Operations, SFOC
EVA	Manager, EVA Project
Flight Crew	Director, Flight Crew Operations
Space and Life Sciences	Director, Space and Life Sciences
Program Integration	Flight Manager Manager, Space Shuttle KSC Integration Manager, Space Shuttle Systems Integration Manager, Space Shuttle Customer and Flight Integration APM, Program Integration, SFOC
Payload Processing	Director of ISS/Payloads Processing
External Tank	Manager, External Tank Project
RSRM	Manager, Reusable Solid Rocket Motor Project
SRB	Manager, Solid Rocket Booster Project APM, SRB Element, SFOC
SSME	Manager, Space Shuttle Main Engine Project
Vehicle Engineering	Manager, Space Shuttle Vehicle Engineering APM, Orbiter Element, SFOC APM, Flight Software, SFOC APM, FCE/EVA, SFOC
Ferry Readiness	Ferry Operations Manager
Shuttle Processing	Director of Shuttle Processing APM, Ground Operations, SFOC APM, Integrated Logistics, SFOC
Range	United States Air Force
DDMS	Director, DDMS
Space Shuttle SR&QA	Manager, Safety, Reliability and Quality Assurance
Exception/Action Summaries	Manager, Launch Integration
Readiness Poll	Associate Administrator, Office of Space Flight

MISSION OPERATIONS DIRECTORATE FLIGHT DIRECTOR OFFICE



STS-107

MISSION OPERATIONS

FLIGHT READINESS REVIEW

January 9, 2003

DA8/P.L. Engelauf

DA8/K.B. Beck

Agenda

- Mission Summary To Be Presented
- Shuttle Flight Software No Issues
- Flight Design & Ascent Overview No Issues
- Flight Procedures No Issues
- Joint Operations Integrated Procedures No Issues
- Crew Training No Issues
- Flight Controller Training No Issues
- Significant Flight Rules To Be Presented
- Special Topics No Issues
- Open Work No Issues
- Network To Be Presented
- USA Flight Operations To Be Presented
- Readiness Statements Included



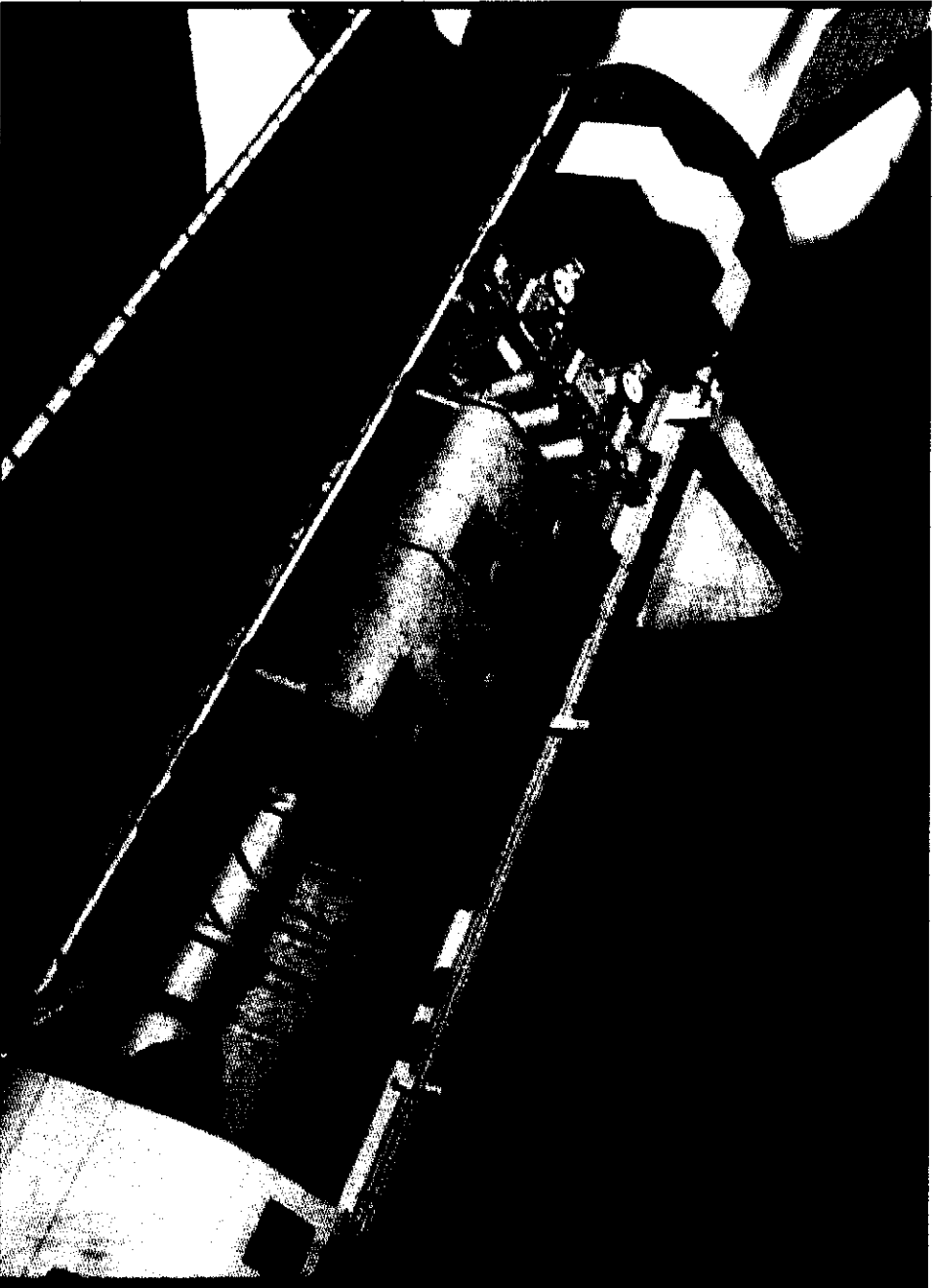
MISSION OPERATIONS DIRECTORATE
Flight Director Office
NASA Johnson Space Center, Houston, Texas

Mission Summary

STS-107 Shuttle Overview

- OV-102 – Columbia
- Crew (dual shift 24 hour onboard operations)
 - Red Team
 - CDR Rick Husband MS2 Kalpana Chawla
 - MS4 Laurel Clark PS1 Ilan Ramon
 - Blue Team
 - PLT Willie McCool MS1 Dave Brown
 - MS3/PL CDR Mike Anderson
- 39° Inclination, Launch Date 1/16/03
 - Launch Window Open 15:39 GMT, 10:39 EST
 - Launch Window Close 18:09 GMT, 13:09 EST (2 ½ hour crew on backs)
- Mission Duration 16+2
- Orbiter Software OI-29
- Landing 2/1/03, 13:49 GMT, 8:49 EST (15/22:10 MET)
- Lighting Launch, RTLS, EOM, TAL (early in window) – Light
TAL (late in window) – Dark

STS-107 Cargo Overview



STS-107 Mission Priorities

- **SPACEHAB**
 - Commercial Payloads (10)
 - ESA/NASA Sponsored Payloads (4)
 - NASA/ISS Sponsored Payloads (1)
 - NASA/Code U Sponsored Payloads (13)
- **FREESTAR (6)**
 - MEIDEX, SOLCON, SOLSE, CVX, LPT, SEM
- **RAMBO (no in-flight requirements)**
- **DTO 700-14 MAGR GPS**
- **DSOs (no in-flight requirements)**

Note: SIMPLEX deletion from Flight Rules
Annex Priorities via Pen & Ink

STS-107 Mission Overview

- FD1 – Launch, post-insertion
 - Blue Team sleep at 4hrs MET
 - Red Team SHAB Activation and Setups, ARMS
- Blue FD2 – SHAB Setup completion
- FD2 through FD15 – Science
 - FD7, 13 off-duty
- FD16 – Exp. deact, cabin stow, FCS C/O, RCS Hot Fire
- FD17 – SH Teardown and Entry Prep, Deorbit/Landing

STS-107 New or Unique Operations

- Unique Multi-discipline international research mission
 - Highly integrated timeline with dual shift operations
 - Simo execute and replan
 - Interactive SPACEHAB POCC
 - ~250 attitude maneuvers to satisfy FREESTAR and SPACEHAB rooftop payloads
 - ~300 Science critical periods driven by command, data, and video requirements
- **1st flight of SPACEHAB Research Double Module**
 - New/enhanced systems capability to support science activities
 - Significant use of Ku-band system for return and *forward* link
 - Experiment commanding – 1st time use of this link
 - Data
 - Video
 - Condensate collection requires Orbiter CWC dumps
 - Rooftop payloads – attitude and pointing constraints

STS-107 New or Unique Operations (cont)

- **1st use of Digital TV for Payload Science Objectives**
 - Used to record and downlink MEIDEX Xybion radiometric camera
 - DTV ground equipment on loan to Goddard to obtain MEIDEX digital video in real-time
- **TDRS Scheduling and Conflict Resolution**
 - ~300 critical periods for science critical cmd/data/video, ~70% of the mission falls in the “Critical” category for network scheduling priorities
 - Agreement with Network to attempt to resolve TDRS conflicts internally at JSC before requesting time from other network users

Flight Rules: TAL Rain Shower Update

- Availability of new Spanish radar data makes it possible to consider similar rain shower exceptions for TAL as allowed for RTLS
 - Previous Spanish radar data was only at a single altitude and not sufficient to implement rain shower exception rule
 - New source of radar data can be used but at a lower frequency and potentially less reliability than the CONUS radar data used for RTLS
 - Sufficient confidence to implement rule for STS-107 with caveats since experience base is not yet fully developed.
- A flight rule will be added to the STS-107 Flight Rules Annex to allow TAL exceptions if the new source of radar data is available
 - Rain showers acceptable if coverage is small, movement is consistent and no additional convective development forecast, light intensity and no lightning potential along the approach corridor
 - Must still meet ceiling/visibility and landing/rollout criteria
 - If launch day conditions results in insufficient confidence in ensuring the rain shower exception criteria are met, this portion of the rule will not be exercised.



Space Communications and Data Systems

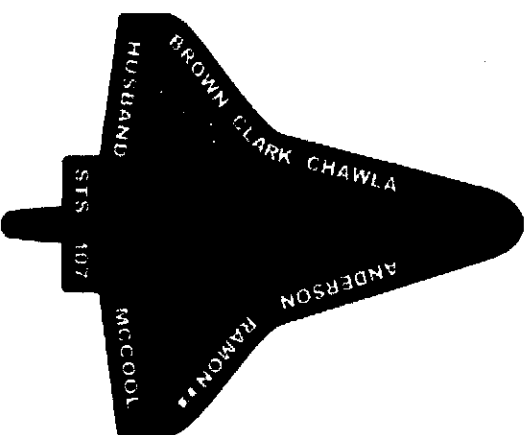


STS-107 SPACEHAB/FREESTAR

Flight Readiness Review

Networks

SPACEHAB



Science Mission

- Spacehab
 - Research Double Module (RDM)
- FREESTAR Hitch Hiker
 - GSFC Communications And Navigations Demonstrations On Shuttle (CANDOS)



Agenda

- Other Network Supported Launches
- Significant Changes
- Unique Network Support

Ted Sobchak
Network Director
GSFC/Code 450
January 2003



STS-107 SPACEHAB/FREESTAR



Other Network Supported Launches

- The following launches are currently planned during the STS-107 mission time frame. Network loading will be heavy.
 - DELTA II ICESAT/CHIPSAT launch scheduled for 1/11/03.
 - WR launch using P3 aircraft and SN.
 - TITAN I/V/B-35 launch scheduled for 1/21/03 (Window DOY 021/2125Z to 022/0135Z)
 - ER launch using SN.
 - PEGASUS/SORCE launch scheduled for NET 1/25/03
 - SN supports SORCE spacecraft.
 - SEALAUNCH/SL-10 scheduled for NET 2/01/03 (STS landing day)
 - SN launch support from Pacific Ocean.



STS-107 SPACEHAB/FREESTAR



Significant Changes

- **Space Network**
 - Delivery of firmware upgrade to the WSC Modulator/Doppler Predictor (MDP) and Test Modem (TM) to support TDRSS experiment configurations. Non-Shuttle.
 - The Boeing TDRS-9 (I) and TDRS-10 (J) are not available for operational support.
 - On Dec. 8 the Super Typhoon Pongsona impacted Guam with maximum sustained winds of ~150 Mph. Commercial power and Navy provided auxiliary power were impacted. Station was red for TDRS-ZOE support until Dec. 18. Station is operational.
- **MIL & PDL**
 - Software delivery to close 13 open discrepancies on several subsystems.
- **NISN**
 - The carrier's analog modems that support the Statistical Mux (Stat Mux) interface have been replaced with digital modems at the operational sites. Stat Mux supports Shuttle Ch-3 high rate data.
 - Stat Mux reinstalled at GSFC in mid-October to support new requirement for 48 Mbps DTV data for FREESTAR/MEIDEX payload.



STS-107 SPACEHAB/FREESTAR



Unique Network Support for FREESTAR

- The FREESTAR payload includes an experiment that has an independent communication link supported by the Network.
 - CANDOS (Communications and Navigation Demonstration on Shuttle) is a communication technology and GPS navigation experiment.
- The CANDOS is a separate communication system and will interface directly with the Space Network (Multiple Access and Single Access services) and the Dryden, MIL, and Wallops ground stations.
- CANDOS-unique equipment has been installed and tested at each station.
 - WSC, DFRC, MIL, WPS



STS-107 SPACEHAB/FREESTAR



Unique Space Network Scheduling

- STS-107 has a highly integrated payload timeline that depends on comm coverage.
- Hundreds of independent, overlapping science critical periods for network coverage
 - There are ~ 300 critical periods covering ~ 70% of the mission.
- A unique SN scheduling process has been developed specifically for STS-107 that addresses Shuttle requirements while balancing the requirements and spacecraft safety for the other SN customers.
- During the forecast period, the TDRS-047 (TDS) SA2 will be blocked for only STS use.
 - Provides for maximum availability to Shuttle since the loading on other SN nodes (West and ZOE) causes conflicts that are harder to resolve.
- During the active schedule, any Shuttle conflicts that exist for services on TDRS-171 or TDRS-W that can be provided by ISS will be negotiated internally at JSC.
- Only the Launch & Landing critical periods will include additional staffing/engineering support.



Space Communications and Data Systems



Certificate of Readiness

Pending completion of flight readiness preparations, remaining standard work and closure of all action items, NASA dedicated elements and all CSOC resources are ready to support the STS-107 SPACEHAB/FREESTAR Microgravity Research Mission

P. E. Lebrecht

1/3/03

P. E. Lebrecht
Associate Director, Program Manager for Mission Services
Goddard Space Flight Center

G. Morse *1/3/03*

G. Morse
Manager, Space Operations Services
Johnson Space Center

(Original signed by) _____

K. Reightler

CSOC Program Manager

Date

STS 107 Flight Readiness Review

	Presenter: S. Q. Hartwig
Organization/Date: Flt Ops / 1/9/03	

**STS-107
Flight Readiness Review
January 9, 2003**

USA Flight Operations



AGENDA

Presenter:	S. Q. Hartwig
Organization/Date:	Flt Ops / 1/9/03

- Flight Operations Accountabilities
 - Flight Design & Dynamics Readiness No Issues
 - Space Flight Systems Readiness No Issues
 - Space Flight Operations Readiness No Issues
 - Space Flight Training Readiness No Issues
 - Facility Readiness No Issues
 - MCC
 - SPF
 - IPS
 - SMS
- Flight Operations COFR Statement To Be Presented

STS-107

Certification of Flight Readiness

Presenter:	S. Q. Hartwig
Organization/Date:	Flt Ops / 1/9/03

- The USA Flight Operations FRR, NASA MOD FRR, and USA SFOC Pre-FRR have been completed.
- All Contractor Accountable Functions (CAF) have been completed, or are scheduled for completion, in accordance with NASA requirements and the applicable portions of the Space Flight Operations contract Flight Preparation Process Plan (NSTS 08117, section 8.5.18 and appendix "R").
- All required products have been or are scheduled to be delivered per requirements.
- All Facilities have been configured and are ready for mission support.
- All CAF personnel are trained and certified or will be trained and certified prior to flight.
- The Flight Crew has been trained.
- There are no open issues.
- Pending completion of the defined open work.

**USA FLIGHT OPERATIONS IS READY
TO SUPPORT THE STS-107 MISSION**


S. Q. Hartwig
Flight Operations

Summary

- STS-107 is a unique flight with highly integrated payload requirements
- Preflight planned timeline satisfies all minimum mission objectives
- The STS-107 Mission Operations team is ready for flight

MISSION OPERATIONS DIRECTORATE
 SHUTTLE CERTIFICATE OF FLIGHT READINESS (CoFR)
 FLIGHT: STS-107 REQUIREMENTS

<p>Critical Processors/Applications, Non-Crit Processors/Applications; Flight Rules; EMCC; Tmg-MCC/POCC; FTP-New Operations; Anomaly-Proc; Ex/Al from Prior Reviews; CIL/Hazards; No Constraints; Level II Actions; Mission Requirements; Exception Resolution; CMD Proc; FPPP Requirements Met; Contractor Process Insight</p>	<p><i>Rich. Ungelenk</i> DA8/Chief, Flight Director Office 12/12/02</p>
<p>Crit Processors/Applications; Non-Crit Processors/Applications; FDF; EMCC; TRNG-MCC/POCC; LCC; FTP-New Ops; Flight Anomaly Resolution; Anomaly-Proc; Ex/Al from Prior Reviews; CIL/Hazards; No Constraints; Level II Actions; Mission Requirements; Engineering Drawings; CMD Proc; FPPP Requirements Met; Contractor Process Insight</p>	<p><i>R.E. Egan</i> DF/Chief, Systems Division 12/12/02</p>
<p>Crit Processors/Applications; Non-Crit Processors/Applications; FDF; FDF Manage; EMCC; PGSS; TRNG-MCC/POCC; FTP-New Ops; Flight Anomaly Resolution; Anomaly-Proc; Ex/Al from Prior Reviews; CIL/Hazards; No Constraints; Level II Actions; Mission Requirements; Engineering Drawings; CMD Proc; FPPP Requirements Met; Contractor Process Insight</p>	<p><i>John A. ...</i> DM/Chief, Flight Design and Dynamics Division 12/12/02</p>
<p>EX/Al from Prior Reviews; No Constraints; Level II Actions; Mission Requirements; FPPP Requirements Met; Contractor Process Insight</p>	<p><i>William ...</i> DT/Chief, Space Flight Training Division</p>
<p>FPPP Requirements Met; Contractor Process Insight</p>	<p><i>John ...</i> DV/Chief, Advanced Operators & Development Division</p>
<p>FAC-NBL; FAC-SVMF; FDF; TRNG-Crew Tmg; TRNG-MCC/POCC; TRNG-EVAMARS; LCC; FTP-New Ops; Flight Anomaly Resolution; Anomaly-Proc; Ex/Al from Prior Reviews; CIL/Hazards; No Constraints; Level II Actions; Mission Requirements; Engineering Drawings; CMD Proc; EVA Hardware Integration; Contractor Process Insight</p>	<p><i>Ron ...</i> DX/Chief, EVA, Robotics, & Crew Systems Operations Division</p>
<p>FAC-MCC; FAC-Network Interface; FAC-SMS; FAC-SPF; FAC-IPS; Crit Processors/Applications; Non-Crit Processors/Applications; FD-Trajectory; FD-Consumables; FD-PDRS; FD-Analyst Cert; FD-CTF; FDF Manage; EMCC; RECON-STARMAS/ICD ROM Products; RECON-MCC; TRNG-Crew Tmg; TRNG-MCC/POCC; TRNG-SMS; FTP-New Ops; Flight Anomaly Res; Anomaly-Proc; Ex/Al from Prior Reviews; CIL/Hazards; No Constraints; Level II Actions; Mission Requirements; Engineering Drawings; Exception Resolution; CMD Proc; FPPP Requirements Met</p>	<p><i>...</i> Associate Program Manager, Flight Operations, SFOC</p>
<p>EMCC; NETWORK; Flight Anomaly Resolution; Anomaly-Proc; Ex/Al from Prior Reviews; No Constraints; Level II Actions; FPPP Requirements Met</p>	<p><i>...</i> Network Director, Shuttle NSIFC 12/12/02</p>
<p></p>	<p><i>...</i> Mission Operations Director</p>

STS-107 FLIGHT READINESS STATEMENT



THE MISSION OPERATIONS FLIGHT PREPARATION PROCESS PLAN DOCUMENTED IN NSTS 08117, REQUIREMENTS AND PROCEDURES FOR CERTIFICATION OF FLIGHT READINESS, HAVE BEEN SATISFIED. REQUIRED PRODUCTS AND OTHER RESPONSIBILITIES FOR MISSION OPERATIONS (NSTS 08117, SECTION 8, PARAGRAPH 8.5.7) HAVE BEEN OR WILL BE PRODUCED OR COMPLETED. ALL AREAS ARE READY. MISSION OPERATIONS IS PREPARED TO SIGN THE CERTIFICATE OF FLIGHT READINESS FOR STS-107

A handwritten signature in black ink, appearing to read "Phil Engelau", written over a horizontal line.

Phil Engelau
MISSION OPERATIONS DIRECTOR

Backup Charts

- Propulsive Consumables Summary
 - OMS/ARCS load (margin) 17,500/4970 lbm (*150 lbm)
*deletion of SIMPLEX burn will increase margin by ~400 lbs
 - FRCS load (margin) 2175 lbm (440 lbm)
 - ~250 attitude maneuvers to support payload requirements
- Non-Propulsive Consumables Summary
 - Cryo H2 (9 tanks) Margin / Padhold
61 lbm / 95 hrs
 - Cryo O2 (9 tanks with 350 lb offload) 260 lbm / 136 hrs
 - N2 (5 tanks offloaded to equivalent of 4) 45 lbm
- LIOH Consumables Summary
 - 66 cans (covers EOM +3)

Flight Readiness – Flight Design

Presenter: S. Q. Hartwig
 Organization/Date: Fit Ops / 1/9/03

Flight Design Accountabilities	Significant Changes	Readiness Issues	To Be Presented
Ascent Trajectory Design and Production	No	No	No
ILOADS (Nominal / Aborts)	No	No	No
Day of Launch ILOAD Update Process (DOLLU)	No	No	No
Orbit Design and Production	No	No	No
Launch Window	No	No	No
Trajectory Sequence of Events	No	No	No
Rendezvous and Proximity Operations (N/A for STS-107)	No	No	No
Clearance Analyses (N/A for STS-107)	No	No	No
Entry and Descent Trajectory Design and Production	No	No	No
ILOADS	No	No	No
Entry, RTLS, TAEM, Landing / Roll-Out Analysis	No	No	No
Commit to Flight Process	No	No	No

There are no readiness issues associated with the listed Flight Operations accountabilities

Facility Readiness – Space Flight Systems	Presenter:	S. Q. Hartwig
	Organization/Date: Fit Ops / 1/9/03	

Space Flight Systems Accountabilities	Significant Changes	Readiness Issues	To Be Presented
Propulsive Consumables Analysis and Production	No	No	No
Non-Propulsive Consumables Analysis and Production	No	No	No
Mass Properties / CG Analysis and Products	No	No	No
Photo TV	No	No	No
IFM	No	No	No
Crew Systems Training (Crew Habitability & Crew Escape)	No	No	No
Robotics Analysis	No	No	No

**There are no readiness issues associated with the
listed Flight Operations accountabilities**



Flight Readiness – Space Flight Operations

Presenter: S. Q. Hartwig
Organization/Date: Filt Ops / 1/9/03

Space Flight Operations Accountabilities	Significant Changes	Readiness Issues	To Be Presented
Flight Data File	No	No	No
Flight Activity Timeline Analysis / Development	No	No	No
Cargo Operations Analysis and Products	No	No	No
Orbiter Communications Adapter (OCA)	No	No	No

There are no readiness issues associated with the listed Flight Operations accountabilities



Flight Readiness – Space Flight Training

Presenter: S. Q. Hartwig
Organization/Date: Flt Ops / 1/9/03

Space Flight Training Accountabilities	Significant Changes	Readiness Issues	To Be Presented
Crew Training Plan	No	No	No
Crew Flight Training	No	No	No
Simulations Completed	No	No	No
Simulations Remaining	No	No	No
Robotics Training	No	No	No
Payload Training	No	No	No
PGSC / Network Training	No	No	No

There are no readiness issues associated with the listed Flight Operations accountabilities

Facility Readiness

Presenter:

S. Q. Hartwig

Organization/Date:

Filt Ops / 1/9/03

Facility Accountabilities	Significant Changes	Readiness Issues	To Be Presented	MCC	SPF	IPS	SMS
Critical Processors and Applications	No	No	No				
Non-Critical Processors and Applications	No	No	No				
Recon / Platform Version	No	No	No				
Significant SR's (Changes)	No	No	No				
Significant AR's (Issues)	No	No	No				
Standard Open Work	No	No	No				
Non-Standard Open Work	No	No	No				
Operator Training and Certification Status	No	No	No				
Real-Time Call Up Readiness	No	No	No				

There are no readiness issues associated with the listed Flight Operations accountabilities





**EVA
PROJECT
OFFICE**



STS-107 / Freestar Flight Readiness Review

**G. Allen Flynt
EVA Project Office
Johnson Space Center
January 9, 2003**



Agenda



- **EVA Mission Overview**
 - No scheduled or unscheduled EVA requirements
- **Standard Contingency EVA training**
 - Payload bay door closure and latches
 - Ku-band antenna realign
- **Logistics**
 - Two EMU's
 - Standard contingency tools
- **EVA Hardware First Flight and Open Items**
 - None
- **EVA Fit Checks and Sharp Edge Status**
 - 100% complete
- **Planned Forward Work**
 - None
- **Special Topic**
 - EMU Biomed Cable Anomaly



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OFFICE**



Special Topic

EMU Bio Med Cable Anomaly

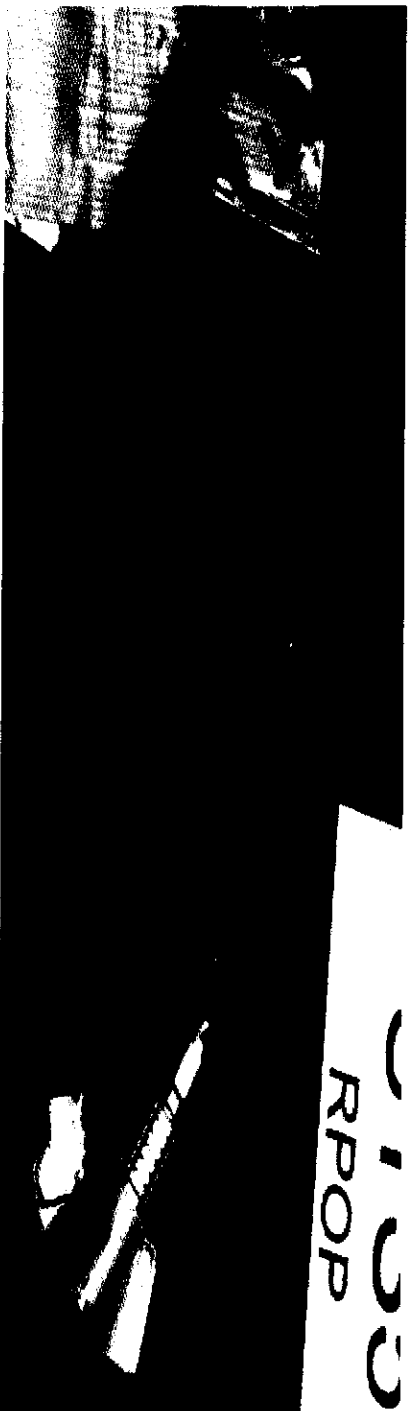


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PROJECT
OFFICE**

Special Topic EMU Bio Med Cable Anomaly



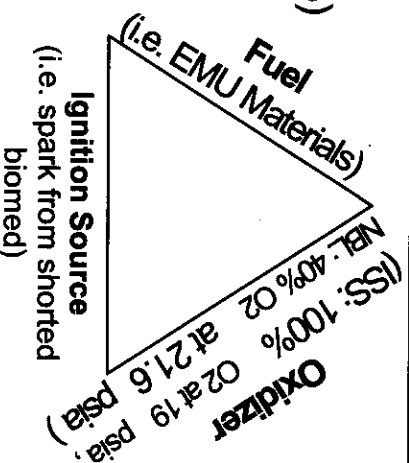
- **Background**
 - After STS 113 – EVA2 the crew noted a break in the insulation of one of the Operational Bioinstrumentation System (OBS) cables.
 - A new cable of the same design was substituted for EVA3
 - Down linked photos of the damaged harness raised numerous concerns
 - Primary and most significant was the concern of an exposed conductor which could arc and initiate a catastrophic ignition event
 - Secondary concerns included workmanship, process escapes, and lack community awareness and sensitivity to the hazard



Special Topic EMU Bio Med Cable Anomaly



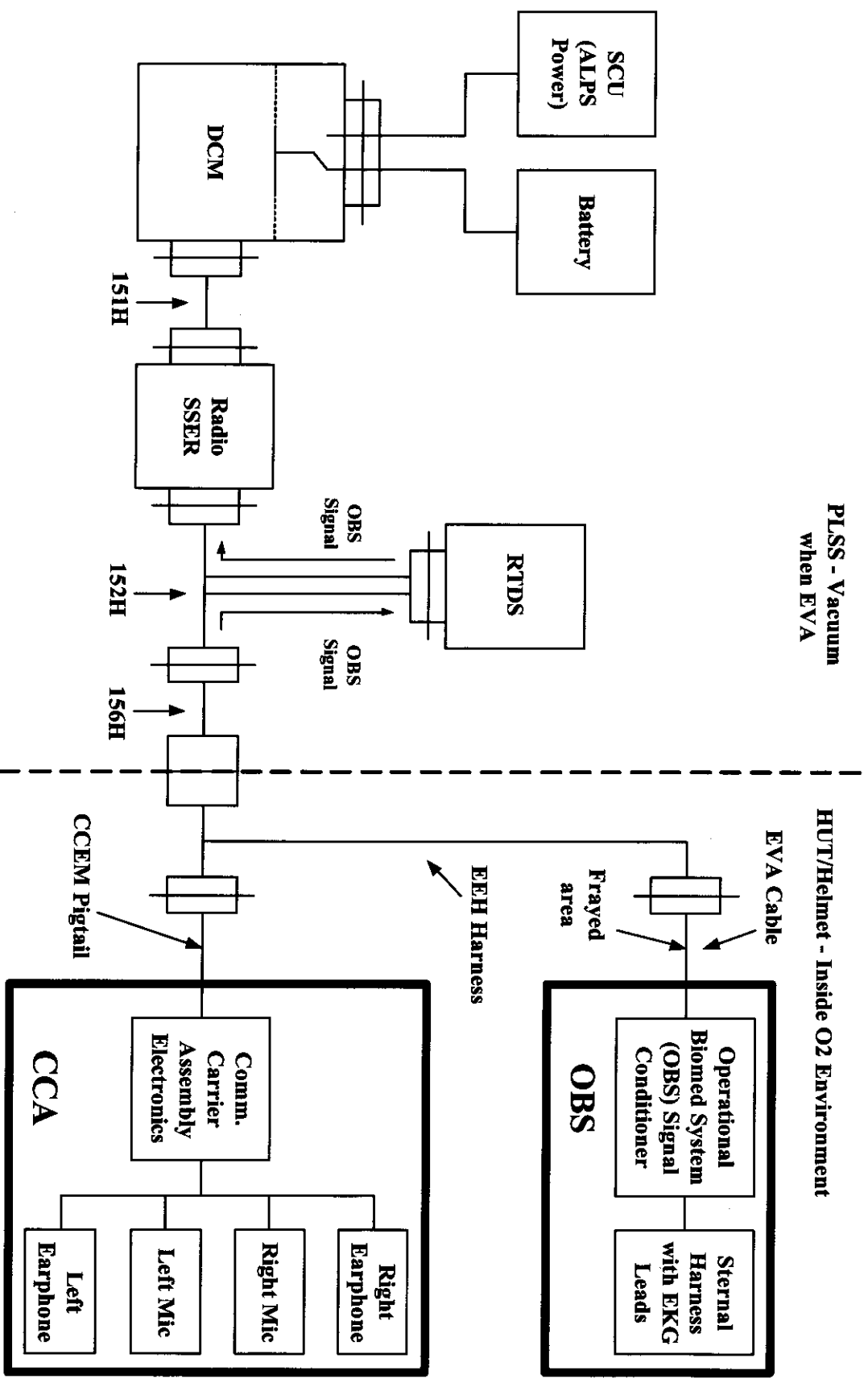
- **Background (Cont.)**
 - In order to have the “worst case” catastrophic ignition event three (3) variables must be present at all times
 - Oxygen
 - Materials serving as a fuel
 - Ignition source (energy in a form of spark from a short)
 - By design the EMU has two (2) of these parameters present at all times and controls the third to ensure safety
 - Appropriate material selection helps minimize risk also
 - Initial review of documentation (Hazard Analyses and FEMA / CIL’s for internal harnessing) did not provide sufficient assurances that ignition sources were adequately controlled in the suit
 - Bio Med harness documentation lacked testing/analysis to substantiate critically
 - It was determined to stand down all operations (both flight and NBL) until a Tiger Team could be formed to ensure controls of third leg of fire triangle were adequate.
 - EVA Project office led a Tiger Team with expertise from multiple JSC organizations including the Engineering Directorate (including electronic parts specialists, material experts, and oxygen expertise), astronaut office, SR&QA, and MOD





EVA
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OBS-CCA Block Diagram in EMU



EVA-6

G. Allen Flynt
January 9, 2003



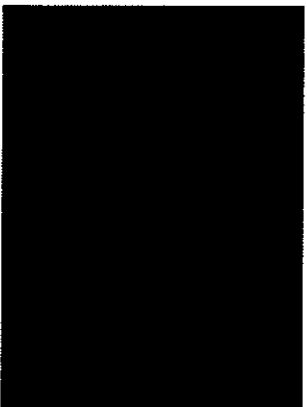
**EVA
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OFFICE**

Special Topic EMU Bio Med Cable Anomaly

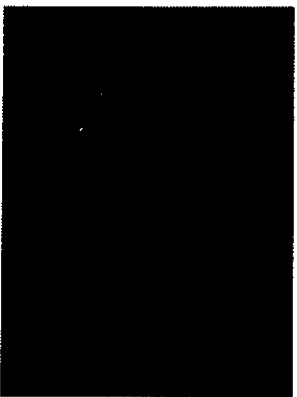


- **Investigative Findings**

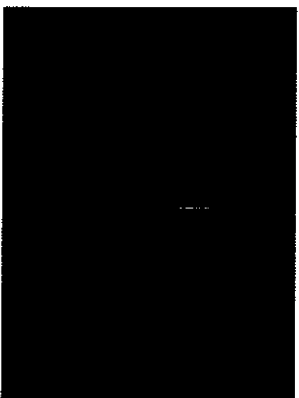
- The internal harnesses within the EMU consist of the following. Each item and related circuitry was evaluated in the investigation.



**Figure 1
Sternal Harness**



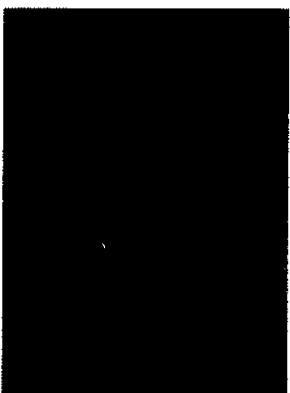
**Figure 4
EVA Cable**



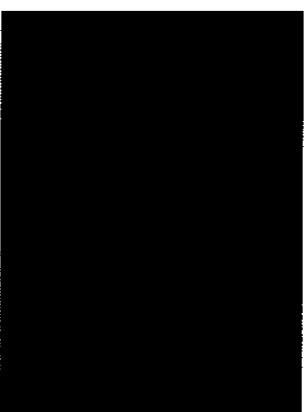
**Figure 2
Signal Conditioner**



**Figure 5
CCCEM Interface Cable**



**Figure 3
EMU Electrical Harness
(EEH)**



**Figure 6
Communication Carrier
Assembly (CCA)**



Special Topic EMU Bio Med Cable Anomaly



- **Summary**
 - In an effort to provide adequate assurances that proper safe guards were in place to control this potentially catastrophic condition, the following conservative methodology was employed
 - Although improbable (and in most cases non-credible) a shorted condition in the in-suit harnesses was assumed to have occurred.
 - This anomaly has never been observed (including STS-113 bio-med cable)
 - » The conductor inside the cable (29 gauge wire), selected specifically for its flexibility in this application, would need to penetrate the Teflon insulation layer and come in contact with the metallic shielding that encapsulates it. Some circuits, such as the audio outputs, would require two conductors to breach the Teflon insulation and contact each other.
 - With a postulated short present, up stream protective circuitry was analyzed and verified to provide adequate safe guards to ensure that initiation of an ignition event was not credible
 - Testing was conducted to confirm analytical findings where required, utilizing conservative factors on each variable (e.g., highest allowable battery voltage, etc.)



**EVA
PROJECT
OFFICE**

Special Topic EMU Bio Med Cable Anomaly



- **Summary (cont.)**
 - Investigation found that the bio-med system will not provide enough energy, even with a short, for an ignition event to be credible
 - Investigation found that the radio (SSER) system will limit energy levels, even with a short, so that ignition initiation is not credible
 - Protective circuitry of the radio is adequate and has been verified by test / analysis
- **Conclusion**
 - No credible ignition event exists within the EMU even when utilizing a very conservative approach and taking into account all failures caused by a postulated short
 - **The EMU integrated system is safe to operate in all applications**



**EVA
PROJECT
OFFICE**

STS-107 / Freestar



- **There are no EVA exceptions for STS-107 / Freestar**
- **The EVA Project Office is ready to proceed with the launch of STS-107 / Freestar**
- **There is no open work**

Original signed by

**G. Allen Flynt
Manager, EVA Project Office**

Mission Management Team L-1 Day Review
January 15, 2003

Agenda

Introduction

Manager, Launch Integration

Mission Operations

Director, Mission Operations
APM, Flight Operations, SFOC

EVA

Manager, EVA Project

Flight Crew

Director, Flight Crew Operations

Space and Life Sciences

Director, Space and Life Sciences

Program Integration

Flight Manager

Manager, Space Shuttle Systems Integration

Manager, Space Shuttle Customer and Flight Integration

Manager, Space Shuttle KSC Integration

APM, Program Integration, SFOC

Payload Processing

Director of ISS/Payloads Processing

External Tank

Manager, External Tank Project

RSRM

Manager, Reusable Solid Rocket Motor Project

SRB

Manager, Solid Rocket Booster Project

APM, SRB Element, SFOC

SSME

Manager, Space Shuttle Main Engine Project

Vehicle Engineering

Manager, Space Shuttle Vehicle Engineering

APM, Orbiter Element, SFOC

APM, FCE/EVA, SFOC

Ferry Readiness

Ferry Operations Manager

Shuttle Processing

Director of Shuttle Processing, KSC

APM, Ground Operations, SFOC

Range

United States Air Force

DDMS

Commander, DOD, Manned Space Flight Support Office

Launch Weather

45th Weather Squadron

Landing Weather

National Weather Service

SS SR&QA

Manager, Space Shuttle Safety, Reliability & Quality Assurance

Readiness Poll

Manager, Launch Integration