GROUND SYSTEMS Development and Operations

EXPLORATION BEGINS HERE



PROGRAM HIGHLIGHTS • NOV/DEC 2012

At NASA's Kennedy Space Center in Florida, the Ground Systems Development and Operations (GSDO) Program office is leading the center's transformation from a historically government-only launch complex to a spaceport bustling with activity involving government and commercial vehicles alike. GSDO is tasked with developing and using the complex equipment required to safely handle a variety of rockets and spacecraft during assembly, transport and launch. For more information about GSDO accomplishments happening around the center, visit: http://go.nasa.gov/groundsystems.

GSDO Year-end Recap

To position the center as a premier launch site for both government and commercial spaceflight missions, NASA's Ground Systems Development and Operations (GSDO) Program is developing multipurpose ground systems and upgrading infrastructure and facilities.

The agency's first Orion spacecraft arrived at Kennedy on June 28. It now is being processed and tested for flight in the Operations and Checkout building high bay. The first uncrewed mission of Orion, called Exploration Flight Test-1, is targeted to launch atop a United Launch Alliance Delta IV rocket in 2014. NASA also is designing a heavy-lift rocket called the Space Launch System (SLS) that will launch future Orion spacecraft from Kennedy and carry astronauts farther into space than ever before.

This year, the program removed hundreds of miles of cables, replacing it with state-of-the-art command, control and communication systems in the Vehicle Assembly Building (VAB) and at pad 39B. Workers also removed space shuttle-era work platforms from the VAB to make room for a more flexible concept and began to upgrade a legacy crawler-transporter to support the SLS.

GSDO Recently Completed Important SRR/SDR

The GSDO Program recently completed an important System Requirements Review/System Definition Review (SRR/SDR) as part of planning for future operations at Kennedy Space Center. The reviews help establish the groundwork needed to launch NASA's Orion spacecraft atop the Space Launch System (SLS) rocket beginning in 2017.

The SRR/SDR began July 11, with a kickoff meeting in which GSDO presented a summary of its program planning, requirements, architecture and operations documentation required for the milestone. The goal was to determine the center's infrastructure needs for future programs and establish work plans for the preliminary design phase.

"This GSDO team has done superb work in achieving this important milestone," said Pepper Phillips, program manager of Kennedy's GSDO Program Office. "This thorough review has validated that our baseline architecture is sound and aligns with the agency's exploration objectives."

For the complete story, visit http://www.nasa.gov/exploration/systems/ground/gsdo_srr_sdr.html.

Crawler-Transporter 2 Takes Trip to Launch Pad 39A

NASA's crawler-transporter 2, or CT2, has been undergoing a major overhaul at Kennedy Space Center to keep the workhorse that has carried spacecraft to the launch pad since the Apollo era going for many years to come. With the first phase of modification work complete, CT2 recently went for a successful test drive that proved all upgrades are working as designed.

During two days in mid-November, the crawler was rolled out to Launch Pad 39A where it picked up the mobile launcher platform and then performed a series of maneuvers to test steering alignment, exhaust bellows, braking, laser docking and how it handled the pad slope.

Last December, engineers began modifying CT2 to ensure its ability to carry launch vehicles currently in development, such as NASA's Space Launch System heavy-lift rocket and Orion spacecraft, as well as other future space program vehicles, to Kennedy's launch pads.

CT2 modifications included AC generator replacement, electronics replacement, cable replacement, tubing replacement, hydraulic component replacement, cleaning of fuel tanks, and cleaning of hydraulic systems.
"We're going to need this special vehicle for many years to come, so it was time for a tune up," said Mary Hanna, NASA crawler-transporter project manager.

For the complete story, visit http://www.nasa.gov/exploration/systems/ground/crawler_test_drive.html.

To view a time-lapse video of CT2 traveling to Launch Pad 39A, visit http://www.nasa.gov/multimedia/videogallery/index.html?collection_id=83501&media_id=155634541.

Railroad Locomotive Undergoes Upgrades in Shuttle-era Facility

One of the NASA Railroad locomotives recently received a major upgrade inside a Space Shuttle Program-era facility at Kennedy Space Center.

One of Kennedy's three Electro-Motive Diesel, or DMD, SW-1500 locomotives, locomotive No. 3, received upgrades inside the unique Rotation, Processing and Surge Facility (RPSF) on the north side of the center's Launch Complex 39 area. The upgrade required the use of all three locomotives.

Years ago, the NASA Railroad team carefully restored locomotive No. 3. But locomotive No. 2 had the better set of wheel and axle assemblies, or trucks. So, they were removed and installed on locomotive No. 3.

First, crane operators lifted the cab of locomotive No. 2 off its truck and moved it aside, clearing the way for locomotive No. 3 to be raided of its trucks and moved into position atop those just separated from locomotive No. 2.

The newly-assembled locomotive No. 3 then was rolled out of the RPSF by locomotive No. 1. Then, locomotive No. 2 was attached to the trucks previously installed on No. 3.

For the complete story, visit http://www.nasa.gov/exploration/systems/ground/rpsf_locomotives.html.

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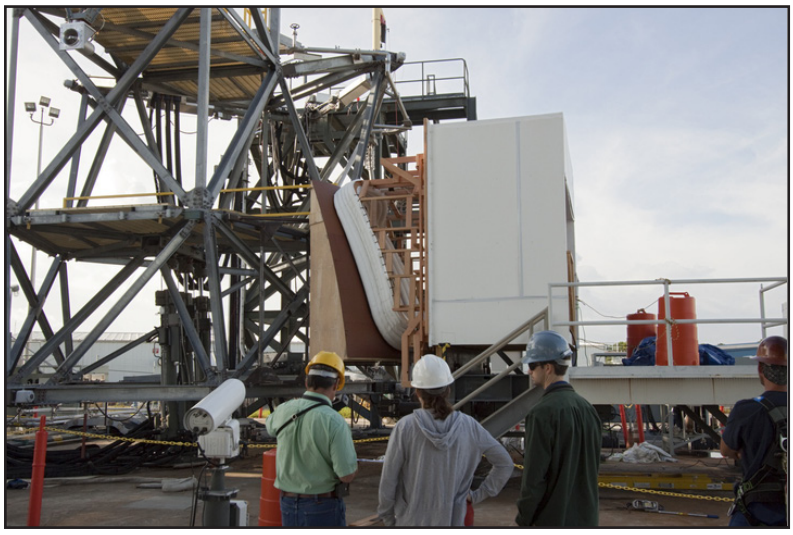
Prototype Crew Access Arm Seal Tested for Orion

Preparations for the launch of NASA's new Orion spacecraft recently took an important step forward. A prototype seal for the launch tower's crew access arm (CAA) was successfully tested at Kennedy Space Center's Launch Equipment Test Facility.

The simulation evaluated the new technology used in the design and function of the inflatable sea. The assessment team used mockups of Orion's outer mold line and the access arm White Room to evaluate the performance of the seal while simulating vehicle to CAA work.

Prior to flight, the CAA and White Room will provide technicians access to the Orion spacecraft. While this is the same concept used for Apollo and the space shuttle, the inflatable seal is an innovation. The final inches between the White Room and the Orion will be filled by the tube-like seal pressing against the spacecraft.

For the complete story, visit http://www.nasa.gov/exploration/systems/ground/caa_seal_tested.html.



Orion Crew Module Pressure Test

The Orion Crew Module was moved to the Operations and Checkout Building proof pressure cell for testing, which began Nov. 1. During the test, the Orion spacecraft was incrementally pressurized with breathing air to demonstrate weld strength capability and structural performance at maximum flight operating pressures.

Orion is the exploration spacecraft designed to carry crews to space beyond low Earth orbit. It will provide emergency abort capability, sustain the crew during the space travel and provide safe re-entry from deep-space return velocities.

For more information about Orion, visit http://www.nasa.gov/orion.

GSDO at Space Shuttle Atlantis "Celebrate the Journey" Event

The space shuttle that flew NASA's last mission of the space shuttle era was transported from the Vehicle Assembly Building to the Kennedy Space Center Visitor Complex on Nov. 2. Atlantis made several stops along the 10-mile journey for employee and general public viewing. The GSDO team had a display on site when Atlantis arrived at Space Florida's Exploration Park near Kennedy Space Center for public viewing.

At the display, Chad Brown, the GSDO program Space Launch System (SLS) liaison, described NASA's new exploration launch vehicle to visitors. During the event, GSDO Chief Architect Scott Colloredo provided updates about the program's recent accomplishments and what lies ahead for the center's facilities that will be used to process the Orion crew module and SLS.

Keep up-to-date with GSDO Fact Sheets and Videos

View the GSDO video trailer at http://www.nasa.gov/multimedia/videogallery/index.html?collection_id=79151&media_id=156982231

View GSDO Fact Sheets at http://www.nasa.go/exploration/systems/ground/index.html

Meet the GSDO management team at http://www.nasa.gov/exploration/systems/ground/team.html

View the GSDO photo gallery at http://mediaarchive.ksc.nasa.gov/search.cfm?cat=241