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ORION

FEBRUARY 2017
ORION’S MONTHLY HIGHLIGHTS

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KEY MILESTONE COMPLETED TO ENSURE ASTRONAUT SAFETY

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ESA TO PROVIDE SERVICE MODULE FOR FIRST ASTRONAUT MISSION

LARGEST SUPPLIERS CONFERENCE EVER!
SERVICE MODULE QUALIFICATION TESTING UNDERWAY AT WSTF

On February 22, engineers successfully installed Orion’s European Service Module Propulsion Qualification Module (PQM) at NASA’s White Sands Test Facility in New Mexico that was delivered by Airbus—the prime contractor to ESA (European Space Agency) for the Service Module. The module will be equipped with a total of 21 engines to support NASA’s Orion spacecraft: 1 U.S. Space Shuttle Orbital Maneuvering System (OMS) engine, 8 auxiliary thrusters and 12 smaller thrusters produced by Airbus Safran Launchers in Germany. The all-steel PQM structure is used to test the propulsion systems on Orion, including “hot firing” of the OMS engine and thrusters.
NASA KICKS OFF STUDY TO ADD CREW TO FIRST FLIGHT OF ORION, SLS

NASA is assessing the feasibility of adding a crew to the first integrated flight of the Agency’s Space Launch System (SLS) rocket and Orion spacecraft, Exploration Mission-1 (EM-1).

Acting Administrator Robert Lightfoot announced Feb. 15 that he asked William Gerstenmaier, associate administrator for NASA’s Human Exploration and Operations Mission Directorate in Washington to conduct the study, which is now underway. NASA expects it to be completed in early spring.

The assessment will review the technical feasibility, risks, benefits, additional work required, resources needed and any associated schedule impacts to add crew to the first mission. It will assume launching two crew members in mid-2019, and consider adjustments to the current EM-1 mission profile.

During the first mission of SLS and Orion, NASA plans to send the spacecraft into a distant lunar retrograde orbit, which will require additional propulsion moves, a flyby of the Moon and return trajectory burns. If the Agency decides to put crew on the first flight, the mission profile for Exploration Mission-2 would likely replace it, which is an approximately eight-day mission with a multi-translunar injection with a free return trajectory.

NASA is investigating hardware changes associated with the system that will be needed if crew are to be added to EM-1. As a starting condition, NASA would maintain the Interim Cryogenic Propulsion stage for the first flight. The Agency will also consider moving up the ascent abort test for Orion before the mission.

Regardless of the outcome for the study, the feasibility assessment does not conflict with NASA’s ongoing work schedules for the first two missions. NASA is leveraging the very best the country has to offer on its deep space exploration plans, and its advancing the national economy.

Read the full story at: http://bit.ly/EM1_CrewStudy
KEY MILESTONE COMPLETED TO ENSURE ASTRONAUT SAFETY

Aerojet Rocketdyne recently completed hot-fire acceptance testing of eight auxiliary engines that will be used on the first flight of NASA’s Orion spacecraft with the Space Launch System rocket, slated to launch in 2018.

Orion’s European Service Module (ESM), which remains connected to the spacecraft throughout the mission until just prior to Orion’s re-entry to Earth’s atmosphere, provides propulsion, power, temperature control, air, and water for crew members. ESA (European Space Agency) is providing the ESM to NASA. Aerojet Rocketdyne is responsible for the ESM’s eight auxiliary engines and is assisting Lockheed Martin in the refurbishment of the Orbital Maneuvering Subsystem (OMS) engine that Aerojet Rocketdyne originally manufactured for the space shuttle and will now be used as the main propulsion for ESM.

The auxiliary engines, which will be located in four pairs on the outside of the ESM, work in concert with the main OMS engine and are critical to ensuring astronaut safety.

In addition to providing propulsion for the ESM, Aerojet Rocketdyne also supplies twelve 160-pound-thrust monopropellant engines for the Orion crew module’s reaction control system and the jettison motor that is instrumental in separating the launch abort system from the crew module to keep astronauts safe should a problem arise during launch.


ESA TO PROVIDE SERVICE MODULE FOR FIRST ASTRONAUT MISSION

On February 16, ESA (European Space Agency) hosted a press conference to highlight a contract signing between ESA and Airbus Defence and Space to build the second European Service Module (ESM) for NASA’s Orion spacecraft. The agreement is a further extension of ESA and NASA’s collaboration in human space flight continuing from the International Space Station. The event took place at an Airbus facility in Bremen, Germany. NASA’s Jim Free, deputy associate administrator for technical in the Human Exploration and Operations Mission Directorate at Headquarters, was one of the speakers at the event. Other participants included Dr. Carsten Sieling, Bremen Mayor; David Parker, ESA Director of Human Spaceflight and Robotic Exploration; Oliver Juckenhoefel, Head of On-Orbit Services and Exploration, Airbus Defence and Space and Matthias Maurer, ESA Astronaut.
U.S. companies that support the Orion, Space Launch System, and Ground Systems Development & Operations programs gathered in Washington, D.C., for the fifth annual suppliers’ conference. More than 250 participants representing over 100 companies and small businesses from 30 states met with Congressional representatives and staffers to talk about their home state's contributions to building the nation’s next human exploration systems that will take astronauts to the Moon, Mars, and beyond—farther into deep space than ever before.

In addition to meeting with state leadership, the supplier representatives heard presentations and had the opportunity to network with NASA leadership, program managers, and space flight legends Bob Crippen and Tom Stafford.

Teams across the United States are making steady progress toward Exploration Mission-1, the first integrated test flight of SLS and Orion, which is currently slated for 2018. To date, workers in 49 states and Puerto Rico have provided support to the nation’s deep space exploration programs through engineering design, skilled manufacturing, testing and analyses, software development and professional services.

The hard-working employees at these companies are helping NASA reach the goal of sending humans to the Moon and on to Mars, and at the same time advancing American manufacturing, technology and innovation, and helping to inspire the next generation of explorers and engineers.
SEN. TAYLOR NAMED 2017 QUASAR HONOREE

Lockheed Martin Vice President and Orion Program Manager Mike Hawes (right) presents a United States flag flown aboard Orion’s first space flight to Texas Senator Larry Taylor who was honored as the Bay Area Houston Economic Partnership’s 2017 Quasar Award honoree at the annual banquet in February. Hawes thanked Senator Taylor for his leadership on the Texas Legislative Space Caucus and his support of NASA’s space exploration missions. Senator Taylor also serves as the chairman of the Senate Public Education Committee and as a member of the Senate Finance, Business and Commerce and Intergovernmental Relations Committees.

The Quasar Award honors an outstanding elected official or business leader who, through his or her actions and leadership, has demonstrated a strong and continual effort to support the business foundations of the greater Bay Area Houston communities. The recipient’s actions must have gone above and beyond to promote the economic development of the region and the fulfillment of the Bay Area Houston Economic Partnership’s objectives to recruit, retain, and expand primary jobs in the region.

U.S. REPRESENTATIVE CRIST VISITS ORION PROGRAM AT KENNEDY


Read how Lockheed Martin Orion Program Manager Mike Hawes is helping lead our march to Mars in the article: From Greenville…To the Red Planet. http://bit.ly/LM_MarchToMars

MARCH

Parachute drop test in Yuma, Arizona
Texas Space Day in Austin
Orion Suppliers Visits in California
NASA at South By Southwest
FEBRUARY 2017
SPACE LAUNCH SYSTEM HIGHLIGHTS
FLIGHT ICPS STARTS JOURNEY AHEAD OF FIRST FLIGHT OF SLS AND ORION

NASA astronaut Butch Wilmore stands in front of the flight interim cryogenic propulsion stage (ICPS) at a February 17 media event at United Launch Alliance in Decatur, AL. The hardware is for the first flight of SLS and is on its way to Cape Canaveral Air Force Station in Florida. The ICPS is a liquid oxygen/liquid hydrogen-based system that will provide the thrust needed to send the Orion spacecraft and 13 secondary payloads beyond the Moon before Orion returns to Earth. The ICPS is the first integrated piece of SLS hardware to arrive at the Cape and undergo final processing and testing before being moved to Ground Systems Development & Operations at NASA’s Kennedy Space Center. The ICPS was designed and built by ULA and The Boeing Company in Huntsville, AL.

A RAINBOW VIEW OF NASA’S RS-25 ENGINE TEST

On February 22, NASA engineers successfully conducted the first RS-25 test of 2017 on the A-1 test stand at NASA’s Stennis Space Center. The initial hotfire is part of a series of tests to be performed this year on both development and flight engines for SLS. Shown from the viewpoint of an overhead drone, the RS-25 ran the scheduled 380 seconds, allowing engineers to monitor various engine operating conditions.

Watch the test here: bit.ly/2mn2nkc
The forward skirt for the left-hand SLS booster arrived Feb. 1 at Cape Canaveral Air Force Station in Florida from booster prime contractor Orbital ATK’s facilities in Promontory, UT. The left-hand forward skirt was transported to Hangar AF, where it will continue refurbishment to support the first flight test of the Orion spacecraft atop the SLS rocket from Launch Pad 39B at Kennedy Space Center. More on the work here: bit.ly/2jvCOw
HUT, HUT, HIKE! NASA GOES TO SUPER BOWL LIVE

Attendees at Super Bowl Live, a nine-day festival celebrating Super Bowl LI, take off in the “Future Flight” ride at Discovery Green in downtown Houston. For this attraction, riders “take a trip to Mars and back” using virtual reality goggles on a 90-foot drop tower.

Future deep space explorers at Super Bowl Live build the world’s most powerful rocket.

Super Bowl Live guests get up close and personal with the SLS RS-25 engine.

While supporting NASA media events during the 2017 Super Bowl Live fan festival, Marshall Center Director Todd May, center, takes a journey to Mars and returns to Earth, landing on the Super Bowl LI 50-yard-line in the virtual reality ride “Future Flight.”
I AM BUILDING SLS: ANTON KOLOMIETS

This ULA engineer is working on major hardware for NASA’s deep-space rocket!
Meet Anton Kolomiets: 2lz7wRW

SPACEFLIGHT PARTNERS: Major Tool & Machine

Major Tool & Machine supports SLS by manufacturing critical components for the RS-25 engine combustion chamber, powerhead and nozzle. The company also manufactures ground testing supports for the solid rocket boosters and key components for the Orion stage adapter and launch vehicle stage adapter.
ACTING NASA ADMINISTRATOR ROBERT LIGHTFOOT SURVEYS MICHOUD TORNADO DAMAGE

Acting NASA Administrator Robert Lightfoot, second from right, tours NASA’s Michoud Assembly Facility in New Orleans. The visit was to learn about damage from the February 7 tornado strike at the facility. In less than a week, the team helped return Michoud to normal operations with limited exceptions, including manufacturing on the SLS core stage.

NASA TO STUDY ADDING CREW TO FIRST FLIGHT OF SLS AND ORION

NASA is assessing the feasibility of adding a crew to the first integrated flight of SLS and the Orion spacecraft, Exploration Mission-1 (EM-1). Acting Administrator Robert Lightfoot announced February 15 that he has asked William Gerstenmaier, associate administrator for NASA’s Human Exploration and Operations Mission Directorate in Washington, to conduct the study, and it is now underway. NASA expects the feasibility study to be completed in early spring.

Read the full story here: bit.ly/2lrBxTM

FOLLOW THE PROGRESS OF NASA’S NEW LAUNCH VEHICLE FOR DEEP SPACE:

Twitter . . . . . . . . . . . . . Twitter.com/NASA_SLS
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COMING UP:

California supplier visits
RS-25 engine testing
Core stage pathfinder delivered to Michoud
GSDO MONTHLY HIGHLIGHTS

Media View New Work Platforms

Spotlight on Paul Espy

Spotlight on Lakie Waldon

Faces of GSDO Prentice Washington
MEDIA VIEW NEW WORK PLATFORMS FOR NASA’S SPACE LAUNCH SYSTEM

Members of the news media recently viewed the ten levels of new work platforms inside High Bay 3 of the Vehicle Assembly Building (VAB) at NASA's Kennedy Space Center in Florida. Work to install the platforms came to conclusion January 12 as the final work platform, A North, was lifted, installed and secured on its rail beam on the north wall of the high bay inside the iconic facility.

“I’m very proud of what our contractor and civil service team has accomplished in transforming Launch Complex 39 from shuttle to supporting the Space Launch System and Orion,” said Kennedy Director Bob Cabana. “A real visual of what we’ve accomplished are the platforms in High Bay 3 of the Vehicle Assembly Building.”

Twenty platform halves will surround NASA’s Space Launch System (SLS) rocket and the Orion spacecraft atop the mobile launcher and allow access during processing for missions, including the first flight test of Orion atop the SLS.

With the goal of being a multi-user facility, the new platforms were designed to be adjusted up and down, and in and out on their rail beams in order to accommodate the SLS and its solid rocket boosters, as well as other vehicles.

“Everything we do here is in support of NASA’s mission, said Shawn Quinn, GSDO associate deputy director. “The journey for humans beyond low-Earth orbit begins here in the Vehicle Assembly Building.”

Design of the new platforms began in 2010. NASA awarded a contract to modify High Bay 3 to the Hensel Phelps Construction Company of Greeley, CO, in March 2014. Hundreds of NASA and contractor workers were involved in the design, manufacture, and installation of the platforms.

The platform levels are A, B, C, D, E, F, G, H, J, and K, with the K-level being the lowest and the A-level the highest platforms.

“We are completing the design and development phase, and we’re now getting ready to move into the test phase,” Cabana said. “The Journey to Mars starts here in High Bay 3.”

The mobile launcher will be rolled into High Bay 3 in the fall for multi-element verification and validation testing with the platforms and launch umbilicals.
Paul Espy is the project manager with Aerodyne Industries on the Test Operations and Support Contract at NASA's Kennedy Space Center in Florida. He received his Project Management Professional certification in 2009.

Since March 2013, his primary responsibility has been to prepare crawler-transporter 2 so that it can carry NASA's Space Launch System rocket and Orion spacecraft atop the mobile launcher to Launch Pad 39B.

Espy began his space career in 1987 when he transferred from the Lockheed Austin Division to the space center as a construction manager to implement Return-to-Flight modifications to Launch Complex 39 shortly after the STS-51L Challenger accident.

He also worked on a variety of construction projects at most of Kennedy's major facilities.

He was responsible for the design and construction of all three clamshell buildings at the Mobile Launcher Parksie, the Logistics Building and the Hypergol Maintenance Facility. He also worked on the pressure vessels systems certifications for facilities that utilize compressed gases.

“Working on the crawler-transporter upgrades has been pretty cool. It is truly a unique, one-of-a-kind vehicle,” Espy said. “Working with the engineers and technicians who carry certifications to maintain and operate this massive vehicle is an honor.”

Espy says the achievement he’s most proud of so far is the completion of the 20-year life extension upgrades to crawler-transporter 2.

“These upgrades increased the crawler payload capacity from 12 million to 18 million pounds to carry the heavy-lift Space Launch System rocket,” Espy said.

Espy first became interested in space in grade school. He was 13 years old when Apollo 11 landed on the Moon.

“I would have sought a career in the U.S. Air Force, with the hopes of being an astronaut, if my poor vision hadn’t kept me out of the running,” Espy said.

Growing up a military brat, it’s hard for Espy to nail down a hometown. He typically claims Prattville, AL, home, since it is where he graduated from high school. He graduated from Auburn University in 1985 with a bachelor of science in civil engineering.

Although he has been contemplating retirement, he will likely remain to see the first crewed flight of Orion. He hopes he will still be alive for NASA's Journey to Mars.

Espy’s first car was a 1964 turquoise Dodge Dart convertible with push-button automatic transmission.

His son, Addison, who is 20, is a specialist in the Army. He was recently stationed in South Korea and returned to his home base at Fort Hood in Texas. His daughter, Marrin, is 19, and attends Eastern Florida State College, while teaching dance lessons at the Titusville Ballet and Jazz Center in Titusville. She also travels throughout the U.S. and Canada to develop choreography for other dance studios.

Espy has a 13-year-old cat named Jasmine that came home about a year ago limping as a result of a bullet in her back. “Due to the proximity near her spine, it could not be removed. I’m not sure how many of her nine lives are left, but she has an amazing ability to survive,” Espy said.

His hobbies include traveling, camping, hiking, and working around the house.
Lakie Waldon is a software quality engineer on the Engineering Services Contract at NASA's Kennedy Space Center. She provides support to the Ground Systems Development and Operations (GSDO) Program. Waldon provides hardware and software quality assurance functions. She also supports delivery of high quality products and services to the end-to-end Command and Control Program and provides feedback on processes and associated work products throughout the life of the program.

“The best part of my job is working with some of the best hardware and software engineers in the industry, and being part of the team that is helping NASA prepare for the next stage of exploration, supporting the first integrated flight of the Orion spacecraft and Space Launch System,” Waldon said.

Recently, she worked as the Launch Control System quality assurance representative on the team that successfully completed test objectives at Marshall Space Flight Center (MSFC) in Huntsville, AL, while testing the GSDO advanced hardware launch control system emulator and the portal work stations in the Systems Integration Lab. During the test, the team was able to send system software and test configuration identifier updates from the Firing Room 3 Master Console at Kennedy to the control system emulator at MSFC.

Another project was the successful completion of the Launch Control System Firing Room 2 Set. She served as the quality assurance representative during the 6-week verification test on user applications and requirement buy-offs using simulated vehicle and ground support equipment.

One of her most memorable moments was participating in the design, development, deployment and maintenance of software using the Ground Operations Aerospace Language, or GOAL.

“The language was used to write tests and procedures to certify that the space shuttle vehicle was ready for launch in Firing Room 1,” Waldon said. “Another memorable moment was STS-8, the first night launch.”

Waldon first became interested in space when she was in college. One of her instructors, who had an affiliation with NASA, sparked her interest in automation and things related to space exploration.

Waldon has worked at Kennedy for many years in a variety of positions. She worked on the Checkout and Launch Control System for the Space Shuttle Program, on NASA Payroll, NASA Procurement, Kennedy’s Electronic Documentation System, and other mainframe applications for the KSC Base Operations Contract.

She advises students to pay attention in science and mathematics classes.

“Learning the basics will help you gain analytical skills and provide the foundation to expand your skills and knowledge into transferable skills,” Waldon said. “It is important to plan, but many skills and experience are easily rewritten.”

Her expectations for NASA is that the Agency will exceed expectations on the next stage of exploration.

Waldon considers Orlando, Florida to be her hometown. Her first car was a 1978 white Ford Mustang. Her hobbies include working with young adults and serving as a mentor for the Future Generation Science Technology Engineering and Mathematics Academy Inc. (FGSTEM).

“Founded in 2010, FGSTEM's mission is to enhance the development of our next generation of leading innovators, technology professionals and entrepreneurs by offering an education curriculum to stimulate and nurture aspiring young students' interest in science, technology, engineering and mathematics,” Waldon said.
Prentice Washington is the Command, Control, and Communications project manager for the Ground Systems Development and Operations (GSDO) Program at NASA’s Kennedy Space Center in Florida. His responsibilities include serving as the project manager of the Communications Office, which manages all of the transmissions, voice and video projects for the GSDO Program.

Washington started working at Kennedy in 2000 in the IT ODIN Office. Before that, he worked for Cooper Tire and Rubber Company. Throughout his career at NASA, he had the opportunity to expand and gain experience as a special assistant to two deputy center directors, Dr. Woodrow Whitlow and Bill Parsons, and spend a year at Glenn Research Center in Cleveland, OH, as deputy chief information officer.

“The coolest part of my job is looking for new and innovative systems to reduce costs for the program. The achievement I’m most proud of is working with several colleges to bring students into NASA to work on exciting, innovative projects,” Washington said.

After working as a special assistant for Whitlow and Parsons, in 2005 and 2006, respectively, he was asked by Ruth Gardner, manager of the Constellation Ground Systems Project Division, to apply for a technical assistant position under her in the Constellation Program. From there, he transferred into the GSDO Program in 2012.

“I’ve always been interested in the space program. It’s been my dream to work here since I was in eighth grade in a small town in southern Arkansas. From the time my parents bought me a telescope for a birthday present and I was able to see the rings around Saturn, I knew I wanted to work at Kennedy Space Center,” Washington said.

His hometown is Hamburg, AR. He attended the University of Arkansas in Fayetteville, and earned a Bachelor of Science in computer engineering in 1992.

The advice he would give to students interested in pursuing a career in a field similar to his is to never stop learning. “The way technology changes so fast, there is nothing you can’t reach and innovate,” Washington said.

His first car was a 1974 red Toyota pickup truck. “It was so ugly we called it Yoda,” Washington joked.

He had been married to his wife, Angela, for 23 years. They have two children, Joel, 27, Kara, 19, and Jesse, 13. They have three dogs (insert names).

Washington’s main hobby now is managing the careers of Kara and Jesse, who are models and actors.
A crane positions the bracket for the Orion Service Module Umbilical (OSMU) for installation March 13 on the mobile launcher tower at NASA’s Kennedy Space Center in Florida. The mobile launcher tower will be equipped with a number of lines, called umbilicals, that will connect to the Space Launch System rocket and Orion spacecraft for Exploration Mission-1 (EM-1). The OSMU will be located high on the mobile launcher tower and, prior to launch, will transfer liquid coolant for the electronics and air for the Environmental Control System to the Orion service module that houses these critical systems to support the spacecraft. EM-1 is scheduled to launch in 2018. The Ground Systems Development and Operations Program is overseeing installation of the umbilicals. Photo credit: NASA/Bill White