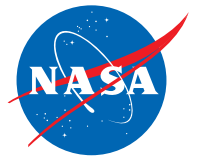


National Aeronautics and
Space Administration



EXPLORATION SYSTEMS DEVELOPMENT

COMBINED MONTHLY REPORT
OCTOBER 2017



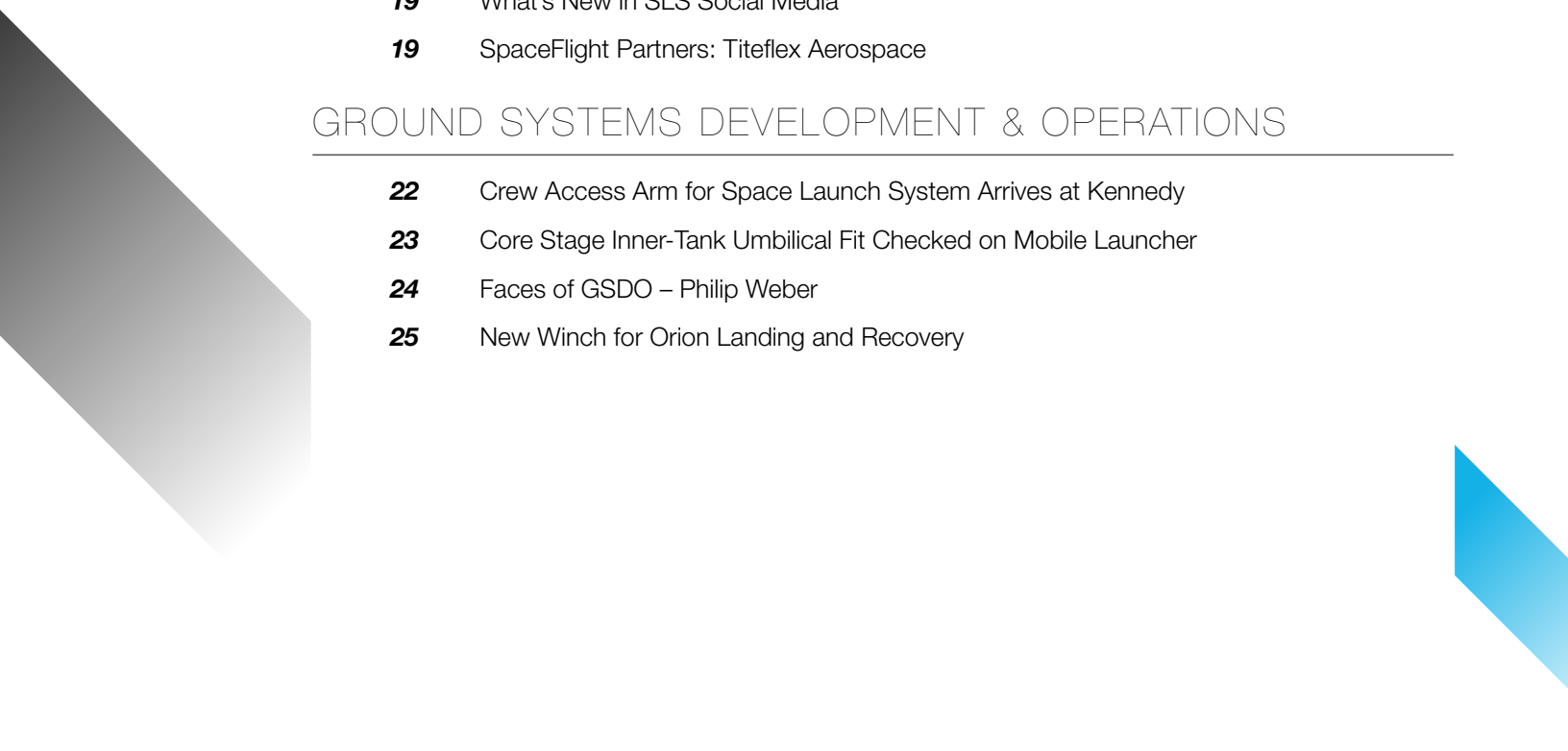
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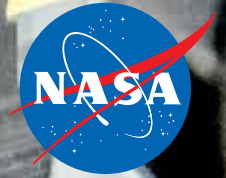
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National Aeronautics and
Space Administration



ORION

SAFETY FIRST

OCTOBER 2017



PAD ABORT TEST ENSURES ASTRONAUT, GROUND CREW SAFETY BEFORE ORION LAUNCHES

NASA recently performed a series of tests to evaluate how astronauts and ground crew involved in final preparations before Orion missions will quickly get out of the spacecraft if an emergency were to occur on the pad prior to launch. This testing took place the week of October 30, using the Orion mockup in the Space Vehicle Mockup Facility at NASA's Johnson Space Center in Houston. In this photo, engineers used simulated smoke to imitate a scenario in which astronauts must exit the capsule with obscured vision.

Before astronauts launch to space in Orion, they will cross the crew access arm 300 feet above the ground and climb inside the crew module with the assistance of ground personnel trained to help them strap into their seats and take care of last-minute needs. During the test, markings on the ground indicated where the crew access arm will be located to help guide the crew.

This testing is a collaborative effort between the Orion and Ground Systems Development and Operations programs. It

is helping engineers evaluate hardware designs and establish procedures that will be used to get astronauts and ground crew out of the capsule as quickly as possible. Flight and ground crew are required to get out of Orion within two minutes to protect for a variety of failure scenarios that do not require the launch abort system to be activated, such as crew incapacitation, fire or the presence of toxins in the cabin. Previous egress testing at Johnson and in the Gulf of Mexico evaluated how crew will exit the spacecraft at the end of their missions after splashdown.

The first crewed test flight for the Orion spacecraft and Space Launch System rocket, Exploration Mission-2 (EM-2), is targeted to launch in the early 2020s from NASA's modernized spaceport at the Kennedy Space Center in Florida. The mission's primary goals are to demonstrate Orion's crew capabilities and the upgraded SLS rocket.

EXPLORING OUTER SPACE IN THE PRESIDENT'S PLACE

NASA engaged families of White House staff members during the space-themed Halloween party, "Exploring Outer Space in the President's Place," hosted by the Eisenhower Executive Office Building on Friday, October 27. Astronaut Kay Hire shared personal stories of life onboard the International Space Station (ISS) and Astronaut Joe Acaba delivered a message directly from the ISS. NASA provided exhibits, hands-on activities, interactive displays and demonstration items for more than 400 children and 200 adults. NASA treats were handed out among Mars and lunar exhibit items where participants were able to view table top models of the Space Launch System, Curiosity and Sojourner spacecraft; experience virtual field trips to Mars and the space station; try on thermal glasses; and engage in other opportunities.



VP PENCE AIMS TO CONTINUE AMERICA'S LEADERSHIP IN SPACE

Vice President Mike Pence recently visited Lockheed Martin's facilities in Waterton, CO, where he met with their leadership and learned more about the company's work on human and robotic space programs, including Orion's progress toward Exploration Mission-1 and beyond. While touring, Pence experienced several of the innovative technologies Lockheed Martin is using to succeed in space exploration, including NASA's InSight Mars lander and a virtual reality engineering lab called the Collaborative Human Immersive Laboratory.

At the conclusion of the tour, Lockheed Martin CEO Marillyn Hewson presented Pence with a flown flag from Orion's Exploration Flight Test-1, which flew farther from Earth than any spacecraft meant to carry humans since the Apollo missions.

ORION TESTING PAVES THE WAY FOR CREW TO EXPLORE DEEP SPACE

Before crew enters Orion with safety procedures and escape routes in mind, the spacecraft's electronics, heat shield, launch abort system and more will all have undergone extensive testing to ensure mission success. While crew will not travel in Orion until Exploration Mission-2, the spacecraft will travel past the Moon and will be tested in cis-lunar orbit during Exploration Mission-1 to pave the way for humans to travel to deep space. Orion team members are working hard to make sure all of the components and parts are ready to go.



Progress continues on Orion's Launch Abort System with the completion of the first two launch abort motors. Both motors have undergone final preparations and will be safely stored at Orbital ATK's Promontory, UT, facility until ready for shipment to NASA's Kennedy Space Center before launch.



Inside the Neil Armstrong Operations and Checkout Building high bay at NASA's Kennedy Space Center in Florida, a variety of test stands, processing bays and hardware are in view. Thermal protection panels and other components for Orion are in various stages of processing. The EM-1 crew module completed its series of functional tests that demonstrated the performance of many vital vehicle systems needed for the EM-1 mission. With the completion of this test series, the crew module then undergoes thermal cycle testing which combine system operations with thermal extremes to validate that vehicle systems operate correctly when exposed to temperatures similar to those seen on orbit.



Technicians at Thales Alenia in Turin, Italy, are working on the primary structure of the European Service Module that will carry astronauts in Orion beyond the Moon during EM-2. The European Space Agency (ESA) and its contractors are providing Orion's service module for its first two missions atop the Space Launch System rocket. NASA is working with domestic and international partners to solve the great challenges of deep space exploration.



Keith Williams, Orion's European Service Module avionics integration lead, recently spoke at the 11th annual European Space Agency Workshop on Avionics, Data, Control and Software Systems. He presented on how verification and validation is a fundamental process in the design and development process, Orion's progress, and the avionics integration and verification approach.



Nujoud Merancy, NASA engineer, recently spoke with students at Haller Middle School about the Orion spacecraft and its mission and her journey to NASA. She gave the students advice and suggestions on how they can achieve their goals, and answered their questions about spaceflight, and Orion.

ORION TEAM INSPIRES GLOBALLY



Carlos Garcia-Galan, Orion Mission & Systems Integration lead, recently presented at the Internet of Things (IOT) Solutions World Congress in Barcelona, Spain. He shared with attendees information on NASA's human spaceflight exploration plans, including Orion's missions to deep space, and new technologies and IOT connections to future spaceflight.



Jessica Vos, Orion crew support equipment system manager, attended the Society of Women Engineers 2017 Annual Conference in Austin, Texas to share Orion's progress and talk about networking opportunities at NASA. Participants were able to meet with Jessica and other NASA leaders to learn more about the roles women play in future space flight and how they can get involved.



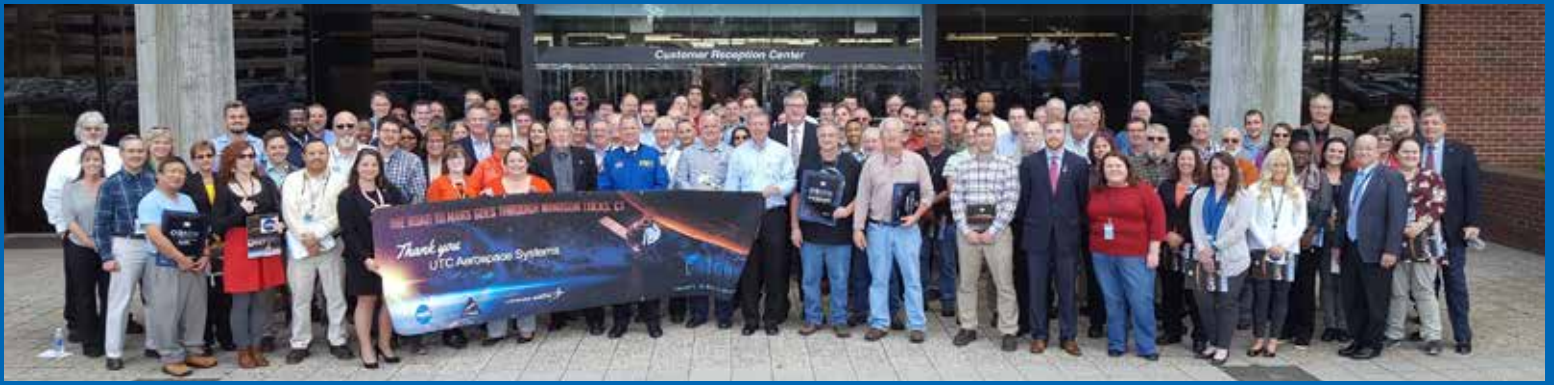
An Anaren team member demonstrating wire bonding during lab tour.

ORION PROGRESS ON THE EAST COAST

Orion team members from NASA and Lockheed Martin visited suppliers in New York and Connecticut to meet employees working on Orion, give an update of Orion’s progress, and recognize those who were making an exceptional difference. The team visited Anaren in Syracuse, NY; Ensign-Bickford Aerospace & Defense in Simsbury, CT and UTC Aerospace Systems in Windsor Locks, CT. Anaren is developing custom hybrid microelectronics for the Orion spacecraft, Ensign-Bickford manufactures pieces that are integral to launch abort and mission safety for Orion, and UTC Aerospace Systems contributes to the Orion environmental control and life support systems.

More about visit to UTC Aerospace Systems: <http://bit.ly/FOXOrionCT>





Orion program representatives visited team members at Honeywell in Clearwater, FL, to get updates on progress and recognize employees for their valued contributions in the development of avionics and guidance flight hardware in support of EM-1. The team delivered 45 flight hardware components in the last three months in support of Orion initial power on, including vehicle management computers, power and data unit cards, inertial measurement units, Global Positioning Satellite receivers, and a barometric altimeter. Honeywell has delivered over 90% of its EM-1 flight hardware to date.

NASA Langley's Orion team hosted Orion Program Manager Mark Kirasich and Deputy Program Manager Charlie Lundquist on October 17. The program leadership met with the Ascent Abort-2 team and saw crew module hardware. An All-Hands event was held for the Langley Orion team where leadership shared large-scale program updates and commended Langley team members for their contributions with notable work on the launch abort system, hatch acoustic testing, heat shield testing and other systems.

POPULAR MECHANICS FEATURES ORION ENGINEER

Cody Kelly, Orion spacecraft's post-landing survival equipment subsystem manager, was featured in *Popular Mechanics* as a recipient of their Breakthrough Awards. As a young man growing up in the small, rural blue-collar town of Bandera, TX, Kelly was an avid reader with an early passion for human space flight, particularly following the effort and energy of a dedicated NASA workforce returning to flight after the Space Shuttle Columbia tragedy. Kelly was only 15 years old, but that event sparked an interest in safety, prevention and helping people in need—and giving back to his community. *Popular Mechanics* editorial assistant, James Lynch, said they selected Cody not just for his many accomplishments in his early career, but also for his innovations that are helping to keep astronauts safe.

More about Cody: <https://go.nasa.gov/2i60hUN>



THERE'S NO PLACE LIKE HOME: KANSAS STATE HELPS ASTRONAUTS RETURN TO EARTH

A mock space capsule has landed at Kansas State University. In this built-to-scale model of the Orion spacecraft, student “astronauts” practice emergency escape maneuvers while a university kinesiology team studies their health and fitness levels. The university research team — led by Carl Ade, assistant professor of exercise physiology, and Thomas Barstow, professor of exercise physiology — is using a NASA grant to tackle a major challenge for long-duration space missions: the return to Earth. The researchers are evaluating the strength, cardiovascular health and aerobic capacity which astronauts require for an end-of-mission landing or an emergency escape. “If we can figure out how to keep an astronaut healthy in this extreme environment, we can translate that to life on Earth,” Ade said. “This research is really helping both individuals: the astronaut and those here on Earth.”



Supporting this effort is the Lockheed Martin Manufacturing and Engineering teams led by Mark McCloskey and Frank Middleton, respectively. Key NASA personnel include Butch Wilmore (NASA Astronaut), Jimmy Spivey (NASA Flight Operations Directorate, assistant director for Exploration Programs), Terri Ryan (NASA Engineering lead), Scott Belbin (NASA Mechanical Ground Systems Equipment lead), Matt Galeano (NASA Materials and Processing) and Kent Beringer (NASA Exploration Mission-2 Spacecraft Production lead).

ASSEMBLING ORION TO PROTECT CREW

Just outside New Orleans on October 24, the EM-2 Crew Module Manufacturing Readiness Review was successfully completed at NASA's Michoud Assembly Facility (MAF). The Orion MAF team is responsible for the pressure vessel structure that will protect Orion's crew throughout missions into deep space. This extensive review is performed to ensure the Orion MAF team has the personnel, resources, equipment, tooling,

and flight hardware thoroughly prepared to execute from first-weld all the way through shipment to NASA's Kennedy Space Center for launch. The Orion MAF team has gone through this process for previous mission milestones such as the Ground Test Article development and Exploration Flight Test-1. They will continue to be a vital team during preparation for the first crewed launch of Orion, EM-2.



HOUSTON | WE HAVE A
PODCAST

HOUSTON WE HAVE A PODCAST

"Houston We Have a Podcast" is the official podcast of NASA's Johnson Space Center in Houston. Episode 17 features Nujoud Merancy, Mission Planning and Analysis lead for the Orion spacecraft. Merancy talks about Orion, how it will work, what kinds of tests are being done to prepare it for future missions, and where in space it will travel.

Listen Here: <http://go.nasa.gov/2iJvYB>

SUPPLIER SPOTLIGHT

Avatar Machine



Avatar Machine, located in Fountain Valley, CA, is a family-owned machine shop providing precision machining services to the aerospace industry since 2008. Avatar's 23 employees are cross-trained in a variety of capacities to be able to work projects for several clients, including parts for Orion. Currently, Avatar is manufacturing eight backbone panels for the Orion EM-2 spacecraft and has already delivered six of them. Employees take pride in their final projects and are excited that their contributions are helping to support future deep space exploration.

FOLLOW THE PROGRESS OF NASA'S NEW SPACECRAFT FOR HUMAN EXPLORATION:

NASA's Orion Blog [Blogs.NASA.gov/Orion](https://blogs.nasa.gov/Orion)
Twitter [Twitter.com/NASA_Orion](https://twitter.com/NASA_Orion)
Facebook. [Facebook.com/NASAOrion](https://facebook.com/NASAOrion)
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NOVEMBER

Orion EM-1 Update
Ascent Abort-2 Flight Test Update
Orion Life Raft / Survival Equipment Evaluations
Turin, Italy ESA / Airbus Event



SPACE LAUNCH SYSTEM

OCTOBER 2017

**ENGINES
READY
TO FLY**

SPACE LAUNCH SYSTEM, STENNIS TEST RS-25 ENGINE SLATED FOR SECOND MISSION



On October 19 at Stennis Space Center in Bay St. Louis, MS, NASA successfully hot-fire tested RS-25 Engine 2063. It was the first hot-fire test of the newly assembled RS-25 as well as its new controller. It also marked the completion of controller flight software verification and validation.

Read the full story: bit.ly/2yAo7Q7

NATIONAL SPACE COUNCIL AFFIRMS AMERICAN LEADERSHIP, ESTABLISHES MOON, MARS MISSIONS



On October 5, acting NASA Administrator Robert Lightfoot (center) attended the NSC meeting at the Smithsonian National Air and Space Museum's Steven F. Udvar-Hazy Center in Chantilly, VA. Vice President Mike Pence addressed the council. Pence, as the chairman of the NSC, announced plans for NASA to direct its path toward deep space exploration, first to the Moon then to Mars and beyond. SLS will be a foundational space asset, enabling access to deep space for a generation.

Read Lightfoot's statement following the meeting here: bit.ly/2j5eWQC

SPACE LAUNCH SYSTEM UPGRADED AND READY FOR A BOLD NEW MISSION:

MEET THE 4 RS-25 ENGINES FOR THE 1ST SLS MISSION



Shown here from the bottom, looking up at the rocket from below, 4 liquid hydrogen (**LH2**) and liquid oxygen (**LOX**)-fueled **RS-25 ENGINES** are arranged in a square pattern, like legs on a table, providing stability and even distribution of propulsion forces to the rocket.

At launch, they will produce **2 MILLION POUNDS OF THRUST** to help power the Space Launch System.



Including these first four engines, NASA has a total **16 ENGINES** available for the first four missions.

www.nasa.gov/sls

WHAT'S IN A NUMBER?

Each engine has its own number and NASA keeps a history of which engines are used on each mission. For the first SLS flight, they are engines **E2045**, **E2056**, **E2058** and **E2060**.

ENABLING MISSION SUCCESS

These four proven engines contributed to **21** successful shuttle flights over three decades.

- **E2045**: most veteran engine with **12 FLIGHTS** (First flight was STS-89 in January 1998 and last was STS-135 in July 2011); also flew on Astronaut John Glenn's last flight, STS-95
- **E2056**: Total **4 FLIGHTS**, including STS-114, NASA's Return to Flight after Columbia
- **E2058**: Total **6 FLIGHTS**, including first flight of a Swedish astronaut (Christer Fuglesang)
- **E2060**: Total **3 FLIGHTS**, including STS-135, the last shuttle mission

WHAT'S NEW FOR SLS?

- **ENGINE CONTROLLERS** - the brains of the engine
- **HIGHER THRUST** - equates with better performance
- **ADAPTED TO SLS UNIQUE OPERATING ENVIRONMENTS**

ENGINE UPGRADES COMPLETE, TESTING CONTINUES

The main engines for the first flight are a go! This new infographic provides a history of the four engines designated for the first mission and describes some key upgrades made to the engine formerly known as the Space Shuttle Main Engine.

These upgrades include new controllers and other adaptations that enable it to meet performance requirements in the more demanding SLS environment. Each SLS flight will be powered by four RS-25 engines and two solid rocket boosters.

Check it out: bit.ly/2zhFIM6



ENGINES READY TO MEET CORE STAGE

The flight preparations for the four engines that will power NASA's Space Launch System (SLS) on its first integrated flight with Orion are complete. The engines are assembled and ready to be joined to the deep-space rocket's core stage. All five structures that form the massive [core stage](#) for the rocket have been built including the engine section where the RS-25 engines will be attached.

"NASA's priority is to deliver hardware for the first flight of the Space Launch System and Orion spacecraft," said John Honeycutt, SLS program manager at NASA's Marshall Space Flight Center in Huntsville, AL. "This year, the SLS team has constructed major parts of the rocket, such as the in-space stage, which is already at NASA's Kennedy Space Center in Florida, the four RS-25 engines, core stage structures and solid rocket booster segments."

The SLS has the largest core stage ever built and includes four RS-25 engines, which previously powered NASA's space shuttle. The RS-25 engines that are being tested and prepared for SLS were proven during the years they were responsible for propelling 135 shuttle missions and have been upgraded for the first SLS flight. The four that will fly on Exploration Mission-1 have flown a total of 25 times on 21 shuttle missions.

Read the full story: bit.ly/2y7UtNR



MARSHALL ENGINEER BARREDA HELPS STEER SLS TO DEEP SPACE

Leonardo Barreda always wanted to work on complex engineering problems, so it's no surprise that he ended up working on a key part of SLS, NASA's new deep-space rocket. Barreda is a mechanical engineer in the propulsion systems department in the Engineering Directorate of NASA's Marshall Space Flight Center in Huntsville, AL. Barreda leads a team that specializes in thrust vector control for the core stage, the 212-foot rocket stage that is the backbone of the SLS rocket.

Read the full story: bit.ly/2y7E9MR

ON THE ROAD WITH SLS



WONDERWORKS

SLS visited 1,700 students at four schools in Sevier County, TN, with retired shuttle astronaut Captain Robert “Hoot” Gibson October 5–6 in support of Science, Technology, Engineering and Mathematics (STEM) outreach. Gibson’s presentation included information about his space flight experience as well as SLS and NASA’s current human space flight plans. The SLS Program also hosted an exhibit at WonderWorks in Pigeon Forge, TN, October 5–8. The exhibition drew more than 10,000 people.



ASSOCIATION OF SCIENCE-TECHNOLOGY CENTERS ANNUAL CONFERENCE

An SLS outreach specialist and retired NASA astronaut Dr. Don Thomas participated in the Exploration Systems Development exhibit at the Association of Science-Technology Centers Annual Conference held October 21–22 in San Jose, CA. ASTC is a global organization for science centers, museums and related institutions around the world. Attendees received information on how to incorporate ESD content into their facilities and experienced virtual reality tours of SLS and Orion on the launch pad at Kennedy Space Center.

WHAT'S NEW IN SLS SOCIAL MEDIA

STYX, SLS ROCK OUT IN SPACE-AGE VIDEO



SLS debuted a deep-space-themed music video with rock band Styx on Facebook following the green-run test for Engine 2063 on October 19. Prior to the video's debut, Styx singer and guitarist Tommy Shaw said, "Congratulations to everyone at NASA on the success of SLS, the Space Launch System. One step closer to Mars. Awesome!"

Watch it here: bit.ly/2zo0Y2A

SPACEFLIGHT PARTNERS:

Titeflex Aerospace

NUMBER OF EMPLOYEES: 340

LOCATION: Laconia, New Hampshire



WHAT THEY DO FOR SLS: Titeflex's aerospace division provides customers with complete fluid transfer solutions in PTFE (Teflon) flexible, rigid or flex-rigid hybrid assemblies. Titeflex supports the RL-10 project in SLS.

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

Twitter [Twitter.com/NASA_SLS](https://twitter.com/NASA_SLS)

Facebook [Facebook.com/NASASLS](https://facebook.com/NASASLS)

NOVEMBER

SLS avionics reach milestone

Launch Vehicle Stage Adapter primed for thermal protection

SLS EM-1 Flight Operations Room nears completion



GROUND SYSTEMS DEVELOPMENT & OPERATIONS

H I G H L I G H T S

OCTOBER 2017

**ORION CREW
ACCESS ARM
ARRIVES**



GSDO MONTHLY HIGHLIGHTS



22 Crew Access Arm for Space Launch System Arrives at Kennedy



23 Core Stage Inter-tank Umbilical Fit Checked on Mobile Launcher



24 Faces of GSDO: Philip Weber



25 New Winch for Orion Landing and Recovery

Check out the GSDO 2016 Year in Review at <http://go.nasa.gov/2IT52Pe>

CREW ACCESS ARM FOR SPACE LAUNCH SYSTEM ARRIVES AT KENNEDY



Two heavy-lift cranes are used to lower the Orion crew access arm onto a work stand in a storage location at Kennedy Space Center on October 17. The access arm was transported from Precision Fabricating and Cleaning in Cocoa, FL. The crew access arm will be located at about the 274-foot level on the mobile launcher tower. It will rotate from its retracted position and interface with the Orion crew hatch location to provide entry to the Orion crew module. The Ground Systems Development and Operations Program is overseeing installation of umbilicals and launch accessories on the ML tower. Photo credit: NASA/Kim Shiflett

When astronauts depart for missions to deep space, they will cross the Crew Access Arm about 300 feet above the ground to board their spacecraft. The access arm was delivered to NASA's Kennedy Space Center in Florida on October 17, 2017, to install on the [mobile launcher](#) in preparation for the [first flight](#) of the [Space Launch System](#) rocket, or SLS, and the [Orion](#) spacecraft.

The SLS will be the largest rocket in the world and will be stacked with Orion inside the historic [Vehicle Assembly Building](#), or VAB, on the mobile launcher and rolled out to the pad prior to launch.

The access arm will be one of 11 connection points to the rocket and spacecraft from the tower on the mobile launcher. After technicians install the arm, the mobile launcher will be rolled into the VAB for validation and verification tests.

For the first launch without crew, the access arm will provide a bridge to Orion for personnel and equipment entering the spacecraft during processing and prelaunch integrated testing while in the VAB and at the launch site. The arm is made up of two major components: the truss assembly and the environmental enclosure, or the white room. The arm will provide entry and emergency egress for astronauts and technicians into the Orion spacecraft.

On future human missions, astronauts outfitted with newly designed space suits will enter the white room, where they will be assisted by technicians into the spacecraft for launch. The arm will retract before launch, and the other connections will release at liftoff, allowing the rocket and spacecraft to safely clear the launch pad.

CORE STAGE INTER-TANK UMBILICAL FIT CHECKED ON MOBILE LAUNCHER



Construction workers assist as a crane moves the Core Stage Inter-tank Umbilical (CSITU) into place for a fit check of the attachment hardware high up on the mobile launcher (ML) tower at Kennedy Space Center. The CSITU will be located at about the 140-foot level of the ML tower. The umbilical will be lowered down and installed permanently on the ML at a later date. Photo credit: NASA/Glenn Benson

Engineers lifted and installed a third umbilical on the mobile launcher at NASA's Kennedy Space Center for a fit check October 14. The tower on the mobile launcher will be equipped with several connections or [launch umbilicals](#) like this one. After the fit check was completed, the umbilical was lowered down and will be installed permanently at a later date.

The umbilicals will provide power, communications, coolant and fuel. They will be used to connect the mobile launcher to the agency's Space Launch System (made up of the core stage, twin solid rocket boosters, and the interim cryogenic propulsion stage) and the Orion spacecraft mounted on top of the SLS.

An area on the SLS between the liquid hydrogen and liquid oxygen tanks is known as the core stage inter-tank. The core-stage inter-tank umbilical is the third in a series of five new umbilicals for the mobile launcher. Its main function is to vent

excess gaseous hydrogen from the rocket's core stage. This umbilical also will provide conditioned air, pressurized gases, and power and data connection to the core stage.

The Orion service module umbilical and the core stage forward skirt umbilical were previously installed on the tower. Several other umbilicals also were previously installed on the mobile launcher. These include two aft skirt purge umbilicals, which will connect to the SLS rocket at the bottom outer edge of each booster and provide electrical power and data connections, remove hazardous gases, and maintain the right temperature range with a nitrogen purge in the boosters until SLS lifts off from the launch pad.

The [Ground Systems Development and Operations Program](#) at Kennedy is preparing ground support equipment, including the launch umbilicals, for NASA's deep space exploration missions.

Philip Weber

Senior Technical Integration Manager

Philip Weber is a senior technical integration manager for the Ground Systems Development and Operations Program (GSDO) at NASA's Kennedy Space Center.

His main responsibilities include making technical decisions at the program review board, co-chairing the cross-program (GSDO, Space Launch System, and Orion) technical board, and chairing the launch commit criteria panel. He also serves as the launch project engineer at the integration console in the Launch Control Center Firing Room 1 for the Exploration Mission-1 prime launch team.

Weber has worked at Kennedy since July 1, 1985. His positions included mechanical systems and project engineer for the Space Shuttle and working in other Kennedy organizations, including Spaceport Engineering, Orbital Space Plane, Crew Exploration Vehicle, and the Constellation Program.

One of his recent accomplishments was serving as the Kennedy GSDO representative on the Crew on Exploration Mission-1 Study Team.

"This study team looked at the safety, cost and schedule implications of flying astronauts on the first launch of NASA's Space Launch System and Orion spacecraft," Weber said. "My role was to lead the Kennedy portion of the study, getting our ground systems ready and detailed changes to the processing and launch flow."

Weber first became interested in space during his senior year of high school in Glasgow, MT, his hometown. His class watched the launch of space shuttle Columbia on STS-1. "What an incredible machine and what brave people flying it!" Weber said.

His interest in space also was influenced by NASA astronaut John Young. "I have always been a fan," Weber said. He received a bachelor of science in mechanical engineering from Montana State University in 1985.

The advice he would give to students interested in a career similar to his is to stay close to hardware and software as long as they can.

"You will spend the latter years of your career in a conference room, so get the flight systems experience when you can. Don't be afraid to move around and try new jobs," Weber said.

Weber has been married to his wife, Mary Ann, for 26 glorious years. They have three children: Annie, 24, Kyle, 21, and Elizabeth, 14. They have an 80-pound puppy named Ollie.

His first car was a 1975 International Harvester pickup, known as "Binder." "I think my dad didn't want me dating in high school," Weber said.

Weber's hobbies include fishing and sampling craft beer.





A new Orion recovery winch was fabricated and assembled at the TOSC Launch Equipment Shop at Kennedy Space Center. Photo credit: NASA/Carla Koch

NEW WINCH FOR ORION LANDING AND RECOVERY

One of the primary lessons learned after last year's Underway Recovery Test 5 was the need for a more powerful winch to pull the Orion spacecraft into the well deck of the recovery ship. The Test and Operations Support Contractor fabricated and assembled the new winch in the Launch Equipment Shop. New computerized controls will sense the load/tension on the line and automatically adjust the speed of the winch to limit the amount

of force being placed on the spacecraft tow points. The winch assembly was shipped to the controls vendor in New York on October 21 for the controls assembly to be integrated with the winch. Members of the GSDO Landing and Recovery Team traveled to New York on October 17 to participate in a successful critical design review.



A partial rainbow in the clouds forms a colorful backdrop for Launch Pad 39B and its three lightning towers at Kennedy Space Center. Photo credit: NASA/Derrick Matthews

National Aeronautics and Space Administration

John F. Kennedy Space Center
Kennedy Space Center, FL 32899

www.nasa.gov

SP-2017-11-1182-KSC

FOLLOW THE PROGRESS OF NASA'S GSDO PROGRAM:

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