



# ESD

## Exploration Systems Development

Combined Monthly Report March 2016

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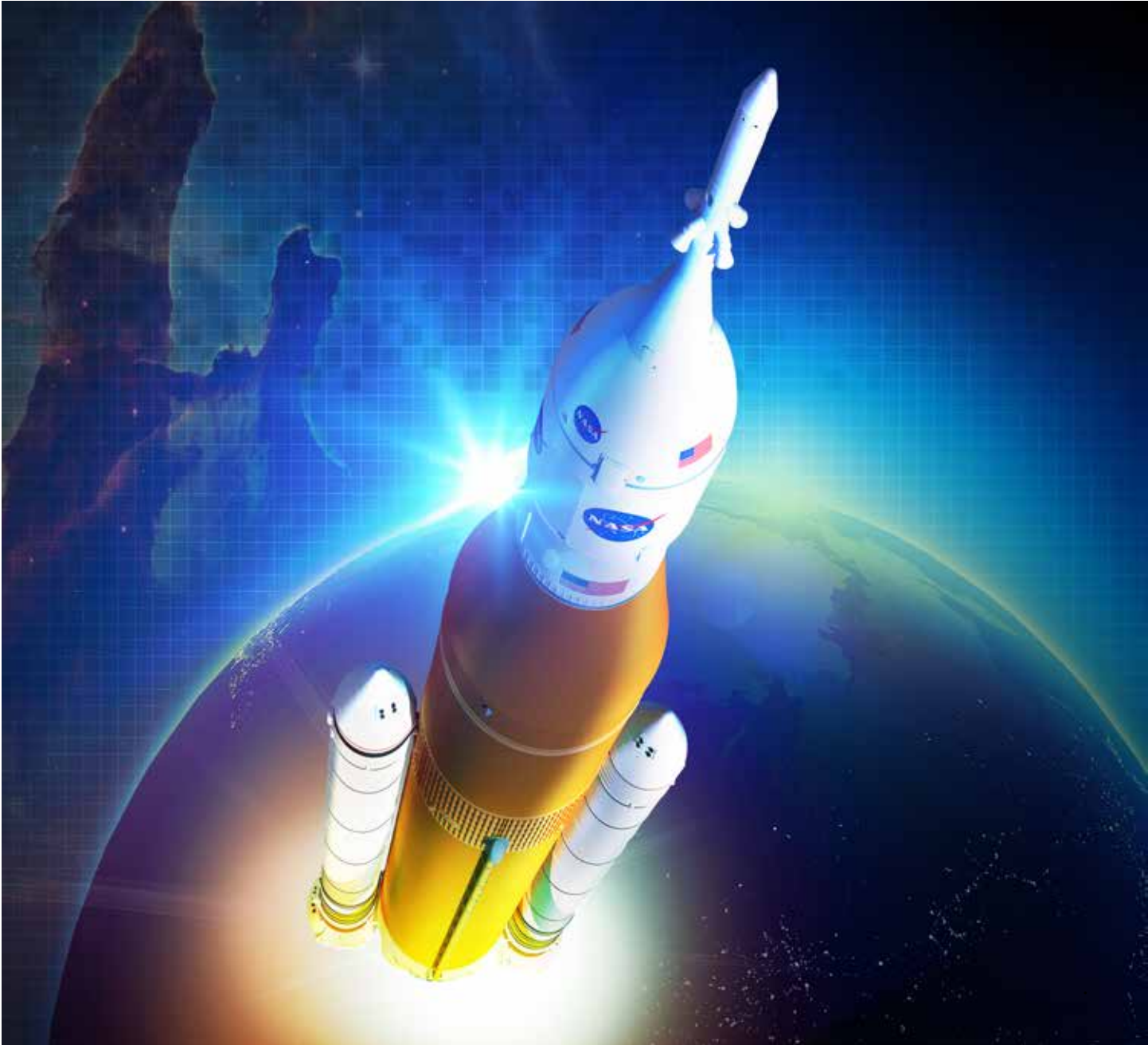
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National Aeronautics and  
Space Administration



# ORION

MARCH 2016

# ROCKING OUT WITH ORION





# MEGAWATTS OF ENERGY TEST ORION'S SOUND STRUCTURE

During the first week of March, the Orion crew module that flew in space on Exploration Flight Test-1 had its own private rock concert. More than 1,500 speakers, generating nearly a megawatt of energy, surrounded the spacecraft and blasted it with sound loads similar to what future Orion missions will experience during launch and ascent.

This new type of acoustic testing, performed in the Reverberant Acoustic Lab of Lockheed Martin Space Systems' Waterton, Colorado, campus, is called direct field acoustic testing. The team is trying it out to see if it is a viable, cost-effective testing mechanism for future Orion missions.

"For a typical acoustic test, we move the spacecraft into a soundproof test chamber, close the door and pump sound through horns to recreate the sound spectrum that the launch vehicle will produce," said Dan Qvale, Orion mechanical test manager at Lockheed Martin. "Direct field acoustic testing allows us to bring the test to the spacecraft instead of having to bring the spacecraft to the test facility. Hundreds of speakers are stacked in a circle around the

spacecraft without having to move the vehicle into an acoustics chamber facility."

Future Orion missions, beginning with Exploration Mission-1, will launch aboard NASA's powerful Space Launch System rocket. To simulate the sound loads Orion will experience during launch, the team needed to evaluate a very high level of acoustic loads.

"The sound we subjected Orion to was louder than jet engines or a stadium rock concert," said Shane Roskie, the Orion test engineer and operations manager.

Using the new direct field acoustic testing will allow greater schedule flexibility and decrease testing costs, helping make the test and production of future Orion capsules more affordable and efficient.

Lockheed Martin also invited media to view the test set-up and to speak with Dan Qvale and Shane Roskie. Examples of the resulting media coverage included:

► Popular Science  
► FOX31 Denver

► CBS Denver  
► 9News

# TEST ENGINEERS PERFECTLY SUITED FOR ORION



Engineers at NASA's Johnson Space Center in Houston are evaluating how crews inside a mockup of the Orion spacecraft interact with the rotational hand controller and cursor control device while inside their spacesuits. The controllers are used to operate Orion's displays and control system, which the crew will use to maneuver the spacecraft.

# ASRC FEDERAL SHINES BRIGHT FOR ORION



Pictured above from left to right: Lockheed Martin Vice President & Orion Program Manager Mike Hawes congratulates Lloyd Gregg, vice president & general manager of spaceflight support services and Charlie Bengston, engineering and aerospace solutions group president, on receiving Lockheed Martin's prestigious Rigel Award.

Lockheed Martin recently honored ASRC Federal Space and Defense with the company's prestigious Rigel Award for 2016, which recognizes a small business subcontractor who performs above and beyond its contractual commitments. Named after the brightest star of the Orion constellation, the Rigel award is Lockheed Martin's Small Business of the Year Award for the Orion Program and is given to those subcontractors who shine above and beyond the call of duty for the prime contractor.

Headquartered in Beltsville, Maryland, ASRC Federal is a subsidiary of Arctic Slope Regional Corporation—an Alaska Native Corporation and Small Disadvantaged Business that was born of the needs of the Iñupiat people of the Arctic. ASRC Federal has provided highly qualified personnel to perform spacecraft final assembly, integration, and test at NASA's Kennedy Space Center Neil Armstrong Operations & Checkout building. ASRC has also demonstrated exemplary services in the development, integration, test, verification and launch support, and provided exceptional engineering services through the full life cycle for Orion Test Labs.

► [Read the full story](#)

# CALIFORNIA COMPANIES ARE MAKING ORION AND SLS A REALITY

NASA and Lockheed Martin Orion program management representatives visited several suppliers throughout the southern California region March 30–April 1 to view Orion elements in production and recognize the workforce for their hard work and dedication to the program. San Diego Composites in San Diego, Avatar Machine in Fountain Valley, and Morrell's Electro Plating in Compton, were among the companies visited. The team also joined representatives from the Space Launch System

Program at AMRO Fabricating Corporation in South El Monte, and Aero Pacific Corporation in Placentia, companies that are manufacturing structures for Orion and SLS. There are more than 762 companies throughout California that provide specialized components or manufacture complex, lightweight structures for Orion and SLS. Media coverage of the site visits included:

► **NBC San Diego**  
► **KUSI News**

► **The San Diego Union-Tribune**



NASA Astronaut Rick Mastracchio signs autographs for employees at Avatar Machine in Fountain Valley, California.



Avatar CEO Denny Nguyen shows NASA's Rick Mastracchio and Lara Kearney some of the complex machining on the Orion backbone.



The team at Hi-Rel Connectors show their enthusiasm for Orion.



The Orion team gathers in front of San Diego Composites' massive autoclave that cures structures for the launch abort system.



Lockheed Martin's Larry Price talks to the AMRO team in front of the crew module section they just finished machining.



AMRO's SLS Program Manager Joe Biancha shows NASA's Rick Mastracchio and Boeing's Will Haas a machined panel for the EM-2 SLS engine section.



NASA's Rick Mastracchio joins the Aero Pacific team on the factory floor in Placentia, California.



Orion program representatives commend the Morrell's team for a job well done.

# THOUSANDS LEARN ABOUT NASA AT SXSW IN AUSTIN



Nujoud Merancy, (center) Orion mission planning and analysis lead for NASA's Johnson Space Center; Chris Crumbly NASA spacecraft/payload integration and evolution manager; NASA Astronaut Victor Glover; NASA Astronaut Jessica Meir; and Yves Lamothe, lead systems engineer for the Ground Systems Development and Operations Program presented at SXSW's "Next for NASA: the Journey to Mars" panel. The team highlighted the steps being taken to prepare humans to visit Mars including studies on the habitability of Mars, the use of the International Space Station as a testbed to study the effects of long-duration missions, the successful Orion 2014 test flight, the on-going manufacture and testing of the Space Launch System rocket, and development of other advanced new systems.

► [Read more](#)





# ORION TAKES CENTER STAGE AT SCIENCE NIGHT

Lockheed Martin Orion team members Brian Foss, Dustin Neill, and Rick Crockford took part in the Clear Creek Independent School District Science Extravaganza at Space Center Houston on March 2. Nearly 3,000 students and parents attended the third annual event to visit dozens of exhibits, enjoy hands-on science-themed activities, and explore Space Center Houston exhibits and educational experience displays. A full-scale training mockup of the Orion spacecraft is on display at Space Center Houston as part of their future space exploration exhibit.



Dieter Jobe, legislative fellow for Rep. Posey (R-FL-8) in Washington, visited the Neil Armstrong Operations & Checkout building at NASA's Kennedy Space Center in Florida to view the Orion crew module pressure vessel and receive a program update on March 9. Accompanying Jobe (second from left in photo), were Joe Mayer, Lockheed Martin government relations; Scott Wilson, NASA Orion production operations manager; and Jules Schneider, Lockheed Martin Orion assembly, integration, & production senior manager.

# ORION HONORED AT GODDARD MEMORIAL DINNER

NASA's Johnson Space Center Deputy Director and former Orion Program Manager Mark Geyer and the Orion Exploration Flight Test-1 (EFT-1) team were each honored at the 59th Annual Robert H. Goddard Memorial Dinner in Washington, D.C., on March 11 by the National Space Club and Foundation.

Geyer received the Astronautics Engineer Award for his many accomplishments throughout a distinguished career in aerospace and systems engineering, and particularly for his leadership in the development and successful flight test of Orion.

The Orion EFT-1 team was recognized with the Eagle Manned Mission Award for its successful execution of Orion's first flight test, which paved the way for the development of the first new American deep space crew vehicle in more than 40 years. Orion Manager Mark Kirasich accepted the award on behalf of the team.

Awards are selected by panels of experts from across the aerospace and defense industry, government and academia, and are a testament to the inspiring work of individuals across the United States.

► [Learn about other recipients](#)

# ORION INTERNATIONAL



International cooperation is seen at its best at the annual Orion European Service Module (ESM) progress meeting held in Bremen, Germany. Pictured here, Orion ESM project team members from across Europe join their U.S. colleagues from Lockheed Martin and NASA during a technical interchange meeting in March. Hundreds of employees in 11 European countries contribute to the Orion Program in their support to Airbus Defence & Space and the European Space Agency. The first ESM space flight structure for Exploration Mission-1 is scheduled to arrive in Bremen at the end of April.

## GO BACKSTAGE WITH ORION

At NASA's Johnson Space Center in Houston, engineer Heather Paul and Astronaut Chris Cassidy put on spacesuits to test out the next generation controller for the Orion spacecraft—NASA's deep space vehicle that will take humans on the #JourneyToMars.

► [Watch the video](#)

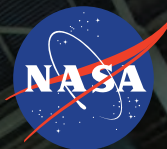


## FOLLOW THE PROGRESS OF NASA'S NEW SPACECRAFT FOR HUMAN EXPLORATION:

- 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/NASAO Orion](https://facebook.com/NASAO Orion)
- Flickr ..... [Flickr.com/NASAO Orion](https://flickr.com/NASAO Orion)
- Google+ ..... [Plus.Google.com/+NASAO Orion](https://plus.google.com/+NASAO Orion)
- Tumblr ..... [nasaorion.tumblr.com](https://nasaorion.tumblr.com)

## APRIL:

- Splash Down Test at NASA Langley Research Center**
- E-STA Acoustic Testing at Plum Brook**
- Station Orion's New York State of Mind**
- Future Generations are Mars Bound!**



MARCH 2016

# SPACE LAUNCH SYSTEM HIGHLIGHTS



**PRECISION  
MEETS  
PROGRESS  
ON SLS  
CONFIDENCE  
TANK**

# MASSIVE MACHINE COMPLETES FINAL WELDING ON SLS CONFIDENCE LIQUID OXYGEN TANK

A liquid oxygen tank confidence article for [SLS](#) completes final welding on the world's largest spacecraft welding tool, the Vertical Assembly Center, at Michoud Assembly Facility in New Orleans. This is the first glimpse of what one of the two tanks will look like that make up the [SLS core stage](#). Confidence hardware verifies weld procedures are working as planned and tooling-to-hardware interfaces are correct. It will also be used in developing the application process for the thermal protection system, which is the insulation foam that gives the tank its orange color. The liquid oxygen tank is the smaller of the two tanks in the core stage. Components of the [liquid hydrogen tank](#) confidence article completed welding in February at Michoud. All welding for the SLS core stage for the Block I configuration of the rocket -- including confidence, qualification and flight hardware -- [will be done](#) this summer in preparation for its first flight with NASA's Orion spacecraft in 2018. See more progress photos on [Flickr](#).



## FINAL HARDWARE DELIVERED FOR SECOND SLS BOOSTER TEST

The fifth and final segment for a full-scale test version of the [SLS](#) booster was delivered March 2 to Orbital ATK's Promontory, Utah, test site. The aft -- or rear -- segment of the booster will be assembled with the other four segments, currently at the test stand, and outfitted for a second booster qualification ground test this summer. The test will measure the booster's performance at a cold motor conditioning target of 40 degrees Fahrenheit and also demonstrate that it meets applicable ballistic requirements. NASA successfully [completed](#) the first booster qualification test in March 2015. The two full-scale tests provide crucial data to support booster qualification for the first two flights of SLS with NASA's [Orion spacecraft](#).

# ENGINE TEST MARKS MAJOR MILESTONE ON NASA'S JOURNEY TO MARS

On March 10, NASA successfully tested a SLS RS-25 flight engine at Stennis Space Center near Bay St. Louis, Mississippi. The RS-25 flight engine was tested for 500 seconds and will be used on the first crewed SLS mission. "Not only does this test mark an important step towards proving our existing design for SLS's first flight, but it's also a great feeling that this engine that has carried so many astronauts into space before is being prepared to take astronauts to space once again on SLS's first crewed flight," said Steve Wofford, engines manager at NASA's Marshall Space Flight Center in Huntsville, Alabama.

## CREWS 'TOP OUT' FIRST OF TWO NEW SLS TEST STANDS AT NASA MARSHALL

On March 4, crews "topped out" Test Stand 4697, which is under construction to test the [SLS](#) liquid oxygen tank at the Marshall Center. "Topping out" is a builders' rite traditionally held when the last beam is placed on top of a structure during its construction. The 85-foot-tall test stand will use hydraulic cylinders to subject the liquid oxygen tank and hardware of the massive SLS [core stage](#) to the same loads and stresses it will endure during a launch. The tests also will verify the models already in place that predict the amount of loads the core stage can withstand during launch and ascent.



Prime contractor *Brasfield & Gorrie* of Birmingham, Alabama, and several of its subcontractors are constructing Test Stand 4697 and [Test Stand 4693](#).



The beam is positioned in place to "top out" Test Stand 4697.



SLS Deputy Program Manager Jerry Cook, center, and SLS Stages Integration Manager Tim Flores, right, sign their names on the test stand beam.

A large orange and white SLS rocket is the central focus of the image, standing vertically in a large exhibition hall. The rocket is inflated and supported by cables. In the background, other smaller rocket models are visible. The scene is filled with people, some looking at the rocket and others at various displays. A prominent display in the background features the NASA logo and the word 'MARS' with the slogan 'Join us on the Journey.'

# SLS *at* SOUTH BY SOUTHWEST

South by Southwest (SXSW) is said to be the premier destination for discovery. With NASA embarking on its own missions of discovery and exploration, the SXSW event was a great place to share information about the agency's goals and initiatives, including the journey to Mars. Throughout the week, some 10,000 SXSW participants got a first-hand look at interactive exhibits and displays, including a virtual tour of the launch pad with SLS on the mobile launcher and snagging the perfect photo op with the 30-foot inflatable of the rocket. NASA Astronauts Victor Glover and Jessica Meir stopped by the booth to greet fans and sign autographs. They also took part in a standing-room-only panel discussion about next steps on the journey to Mars, which concluded with a standing ovation. NASA at SXSW was featured in several media publications, including AdWeek and The Austin Chronicle.

*Event goers take a look at the 30-foot SLS inflatable.*

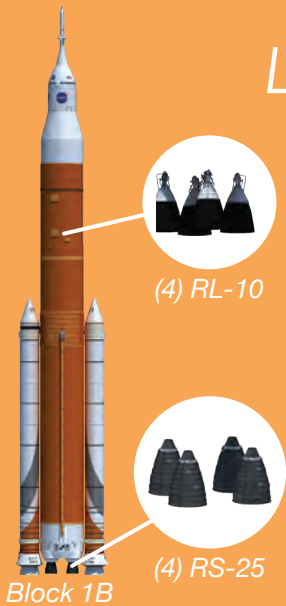


On the journey to Mars panel is, from left, NASA Astronaut Jessica Meir; NASA Astronaut Victor Glover; Nujoud Merancy, Orion Mission Planning lead; Chris Crumbly, Spacecraft/Payload Integration and Evolution manager; and Yves Lamothe, lead systems engineer for the Ground Systems Development and Operations Program.



A NASA fan taking a virtual tour of the launch pad with SLS.

## SPACEFLIGHT PARTNERS: LeFiell Manufacturing Company



**LOCATION:**  
Santa Fe Springs, California

**NUMBER OF EMPLOYEES: 105**

LeFiell produces tapered metal tubes that are used to build thrust chambers for both the RS-25 engines that will help power the SLS core stage and the RL-10 engines that are slated for use on the SLS Block 1B Exploration Upper Stage.

Super-cooled, cryogenic liquid hydrogen flows through the tubes to help keep the thrust chambers cool before it is mixed with liquid oxygen and burned in the combustion chamber to produce thrust. Each RS-25 engine contains 1,080 coolant tubes, and each RL-10 engine contains 360 coolant tubes.

With four RS-25 engines on the SLS core stage and four RL-10 engines on the Exploration Upper Stage, a whopping 9 miles of tubing will be used to support each SLS Block 1B launch.



# SLS GOES TO THE ALABAMA CAPITOL

The 30-foot inflatable SLS and the RS-25 engine (not pictured) lined Washington Street on March 10 for NASA Day at the Alabama State House in Montgomery. The annual event recognizes NASA and the state's enduring relationship with the space agency. NASA team members also visited Montgomery-area schools and the W.A. Gayle Planetarium in Montgomery, engaging students in science, technology, engineering and math activities.

## SLS MANAGER JOHN HONEYCUTT TALKS ROCKETS IN DECATUR

SLS Program Manager John Honeycutt talks about progress on the rocket and NASA's journey to Mars on March 7 with some 120 members of the Decatur Rotary Club of Decatur, Alabama.



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

- NASA SLS Rocketology Blog.... [blogs.nasa.gov/Rocketology](http://blogs.nasa.gov/Rocketology)
- Twitter..... [Twitter.com/NASA\\_SLS](https://twitter.com/NASA_SLS)
- Facebook..... [Facebook.com/NASASLS](https://facebook.com/NASASLS)
- Flickr..... [Flickr.com/NASASLS](https://flickr.com/NASASLS)
- Google+..... [Plus.Google.com/+NASASLS](https://plus.google.com/+NASASLS)
- Tumblr..... [nasasls.tumblr.com](https://nasasls.tumblr.com)

## COMING IN APRIL:

**Launch vehicle stage adapter structural test article welding complete**

**EM-1 booster aft segment cast**

**SLS suppliers' visits**





**GSDO**  
GROUND SYSTEMS  
DEVELOPMENT & OPERATIONS

EXPLORATION BEGINS HERE



PROGRAM HIGHLIGHTS • MAR/APR 2016

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://www.nasa.gov/groundsystems>.

## NASA's 'Spaceport of Future' Reaches Milestone

NASA recently completed a major milestone on its journey to Mars and is ready to begin another phase of work on its spaceport of the future, where the next generation of astronauts will launch to Mars and other deep-space destinations.

The agency wrapped up a comprehensive and successful review of plans for the facilities and ground support systems that will process the Space Launch System (SLS) rocket and Orion spacecraft at NASA's Kennedy Space Center in Florida.

The Ground Systems Development and Operations Program (GSDO), responsible for processing SLS and Orion for flight and ensuring all systems and facilities are ready, completed its critical design review in December 2015. An independent assessment by a Standing Review Board was completed in January.

In the final step before actual fabrication, installation and testing of Kennedy's ground systems, the GSDO program and review board briefed the results of their assessments to NASA's Agency Program Management Council, led by Associate Administrator Robert Lightfoot.

"The team is working hard and we are making remarkable progress transforming our facilities," said Mike Bolger,



*This artist concept depicts the SLS rocket rolling out of the VAB at NASA's Kennedy Space Center. Image credit: NASA/Marshall Space Flight Center*

GSDO Program manager. "As we are preparing for NASA's journey to Mars, the outstanding team at Kennedy is ensuring that we will be ready to receive SLS and Orion flight hardware and process the vehicle for the first flight in 2018."

The heavy-lift rocket will be stacked in the Vehicle Assembly Building on the mobile launcher and roll out to Launch

Pad 39B atop a modified crawler-transporter. The Orion spacecraft will be fueled with propellants in the Multi-Payload Processing Facility at the center prior to stacking atop the rocket. The launch team will use the new command and control system in the firing room as the clock counts down to liftoff of SLS's first flight.

# Pathfinder Operations Pave Way for SLS Processing

NASA's Space Launch System (SLS) rocket will be the most powerful in the world, and is the vehicle that will launch humans beyond low-Earth orbit and on to deep-space destinations as the agency continues its journey to Mars. The Ground Systems Development and Operations Program at Kennedy Space Center is preparing its workforce, facilities and ground support equipment to handle the processing requirements of the SLS rocket and Orion spacecraft for its launch.

A team of NASA engineers and Jacobs technicians and crane operators on the Test and Operations Support Contract are preparing for Exploration Mission 1 (EM-1) processing activities. Experienced personnel are leading the preparation effort using pathfinders, or test versions, of an aft skirt and two inert segments of a solid rocket booster (SRB) inside the Rotation, Processing and Surge Facility (RPSF) at Kennedy Space Center in Florida.

The aft skirt and booster segments are similar to those that will be used on the Space Launch System (SLS) rocket. At launch, the twin SRBs will provide more than 75 percent of the total SLS thrust and operate for about two minutes before separating from the core stage. The aft skirt is at the base of the booster and contains the system that will steer the booster nozzles.

"The RPSF was used for space shuttle booster segments," said acting NASA Integrated Operations Flow Manager David Diaz. "Upgrades and modification to the heritage test stands and work platforms recently were completed to accommodate the new aft booster assembly, and particularly the longer nozzle."

The pathfinder operations are performed to help verify that the upgrades and modifications completed in the RPSF will support processing requirements for the aft skirt, SRB segments and the integrated aft booster assembly to ensure a smooth liftoff at launch.

"After we've completed pathfinder operations in the RPSF we will continue with additional testing operations in the Vehicle Assembly Building," said Kerry Chreist, project flow manager with Jacobs. "The crane operations in the RPSF will operate the cranes in both facilities."

To read the complete story, visit <http://go.nasa.gov/1SFR0Lz>.



Members of the news media watch March 1 as two cranes are used to lift one of two pathfinders, or test versions, of solid rocket booster segments for NASA's SLS rocket into the vertical position inside the Rotation, Processing and Surge Facility at NASA's Kennedy Space Center in Florida. Photo credit: NASA/Bill White



Inside the Rotation, Processing and Surge Facility high bay at NASA's Kennedy Space Center in Florida, engineers and technicians with Jacobs Engineering on the Test and Operations Support Contract monitor the progress Feb. 25 as two cranes are used in tandem to lift the first of two pathfinders, or test versions, of solid rocket booster segments for NASA's SLS rocket. Photo credit: NASA/Ben Smegelsky

# Custom Equipment Required to Install New Platforms in VAB

A spreader bar weighing thousands of pounds and a wrench that is nearly four feet long are not the usual type of equipment you would carry in a toolbox or store in your garage. But they are among the larger-than-life specialized tools that are used by technicians and construction workers at Kennedy Space Center to prepare and install the giant work platforms in the Vehicle Assembly Building (VAB) for the agency's Space Launch System (SLS) rocket and Orion spacecraft.

In High Bay 3 of the VAB, 10 levels of work platforms, 20 platform halves altogether, will surround the SLS rocket and Orion spacecraft and provide access to process and prepare them for launch to deep-space destinations, such as the journey to Mars. Two sets of work platforms, the K-level and J-level platforms, recently were installed in the high bay, about 86 feet and 112 feet above the VAB floor, respectively.

During one of the platform installations, Allen List, an iron and rig foreman with S&R Enterprises of Harrisburg, Pennsylvania, a subcontractor to VAB general contractor Hensel Phelps, handled the 50-pound, nearly-four-foot-long wrench like a pro as he turned and tightened the large corbel pin locks, or rail bolts, that will keep the platform securely fastened to the structural steel of the high bay.

Along with the wrench, he also wore a tool belt that weighs about 45 to 50 pounds, plus the tether system that all of the construction workers are required to use when performing tasks above the ground level.

Tools such as the wrench and long pry bars were acquired from an industrial tool supplier, but Hensel Phelps and the architect of record, Reynolds, Smith and Hills, created several of the unusual tools specifically for the VAB work project.

"Some tools, like wrenches or pliers, have the same name as those you would find at other construction sites. The difference is the scale of the tools at Kennedy are much bigger," said Rebecca Baturin, VAB project engineer with the Ground Systems Development and Operations Program.

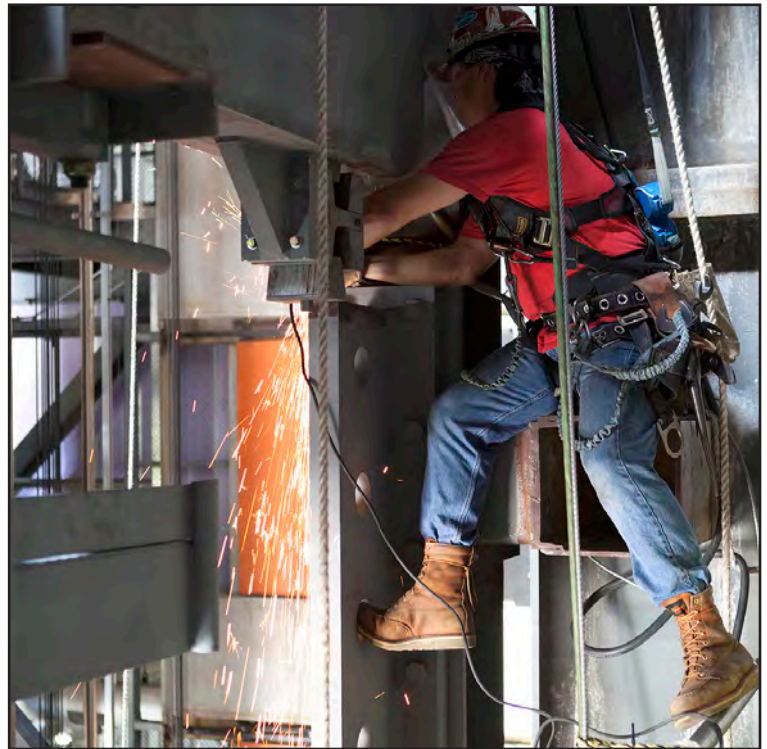
"It's an honor to help contribute to NASA's space program," List said. "Nowhere else in the country would we have the opportunity to contribute to something like the work we are doing in the Vehicle Assembly Building. This is a very exciting time."

Whether it is with a 4-foot wrench or a 15-ton spreader bar, Kennedy Space Center is well on its way to preparing the VAB High Bay 3 for the SLS rocket and Orion spacecraft and the agency's journey to Mars.

To read the complete story, visit <http://go.nasa.gov/1SFRPnz>.



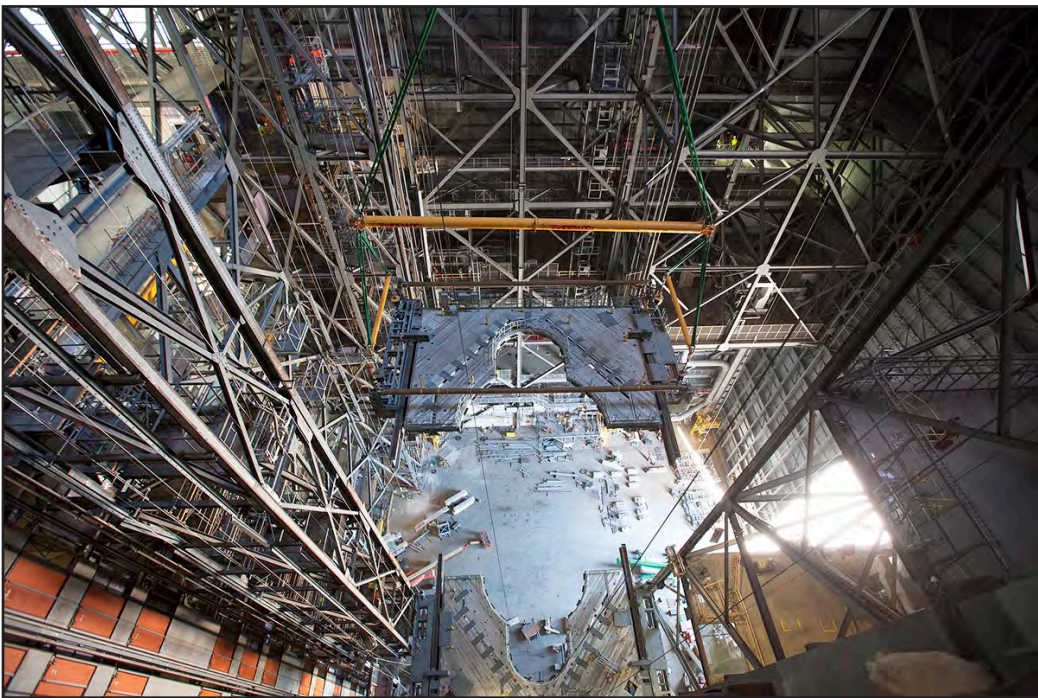
Allen List, an iron and rig foreman with S&R Enterprises of Harrisburg, Pennsylvania, holds a nearly-four-foot-long, 50-pound wrench that he uses to tighten bolts during installation of the large work platforms inside VAB High Bay 3. S&R is a subcontractor to VAB general contractor Hensel Phelps. Photo credit: NASA/Ben Smegelsky



A construction worker, wearing safety gear and tethered to safety lines, works on one of the bolts during installation of the second half of the J-level work platforms April 15. Photo credit: NASA/Dimitri Gerondidakis

View a short video of platform installation in the Vehicle Assembly Building at:  
<https://www.youtube.com/watch?v=YYgXNT6QCEw>

# Going Up? New Work Platforms Taking Shape in Vehicle Assembly Building



A 250-ton crane is used to lower the second half of the K-level work platforms into High Bay 3 on March 7. The platform was secured about 86 feet above the VAB floor, on tower E of the high bay. The K work platforms will provide access to the SLS core stage and solid rocket boosters during processing and stacking operations on the mobile launcher. Photo credit: NASA/Dimitri Gerondidakis



The first half of the F-level work platforms for NASA's SLS rocket arrived at the VAB on March 8. Photo credit: NASA/Dimitri Gerondidakis

The Ground Systems Development and Operations Program is overseeing upgrades and modifications to VAB High Bay 3 to support processing of the Space Launch System (SLS) rocket and Orion spacecraft. A total of 10 levels of new platforms, 20 platform halves altogether, will surround the SLS rocket and Orion spacecraft and provide access for testing and processing to prepare for Exploration Mission 1 and NASA's journey to Mars.



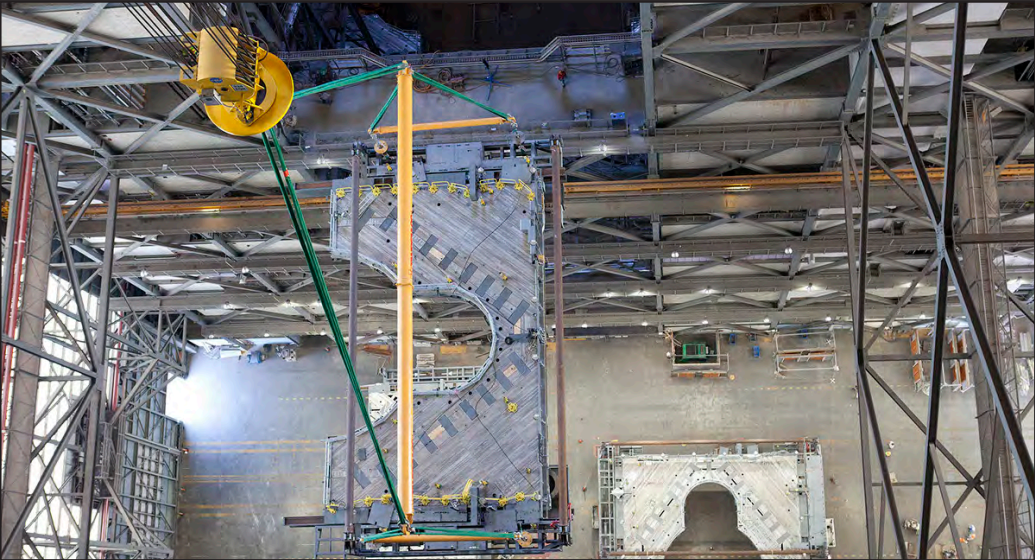
A view from below, in High Bay 3 inside the VAB shows three work platforms installed for NASA's SLS rocket. The lower platforms are the K-level work platforms. Above them are the J-level work platforms. A crane is lowering the second half of the J-level platforms for installation about 112 feet above the floor, or nearly 11 stories high. Photo credit: NASA/Dimitri Gerondidakis



Platform J-North is moved into the VAB on March 9. Photo credit: NASA



A heavy load transport truck arrives March 29 at the center's north entrance gate, carrying the second half of the F-level work platforms for the agency's SLS rocket. Photo credit: NASA/Ben Smegelsky



A view from high above inside the VAB shows the first half of the J-level work platforms for the agency's SLS rocket lifted by crane April 5 for installation in High Bay 3. Photo credit: NASA/Glenn Benson

# Ground Systems Team Spotlight



**Jody Sills** is the Integrated Processing Solutions Project manager with Aerodyne Industries on the Test and Operations Support Contract (TOSC) at Kennedy Space Center. Her primary responsibilities include developing requirements to configure software products (i.e. TOSC versions of Maximo, Cradle, PeopleSoft and others) based on business processes and user needs, defining the integrated interfaces and user testing, and developing associated business processes.

Sills also is the Solumina functional lead and provides support to all users, including classroom training, and individual support and problem resolution.

Sills began her career at Kennedy in June 1988 on the Space Shuttle Program in flight crew systems engineering, and worked with the Astronaut Office at Johnson Space Center to configure the orbiter crew module for each mission, before moving on to a process integration function. This transition provided her with the skills needed for her job with TOSC supporting the Ground Systems Development and Operations Program (GSDO).

“The coolest part of my job is that it touches a little bit of everything and there is so much opportunity to get involved in different aspects of the program,” Sills said. “I go to all of the different facilities, work with many different people, from the shop, to engineering, to upper management.”

Sills became interested in aviation when she was a child. Her father was a member of the Experimental Aviation Association and she watched him build a small one-person biplane in their basement.

“I knew that I wanted to do something

in the aviation industry. I didn’t know that my career would bring me to the space industry,” Sills said. “I remember being riveted to our fuzzy, black and white television, watching an Apollo landing, and the first shuttle launch in high school, so it must have been my destiny.”

Sills’ hometown is Orange Village, Ohio, a suburb on the east side of Cleveland. She earned a Bachelor of Science in aeronautical and astronautical engineering in 1988 from Ohio State University.

She has been married to her husband, Ed, for 25 years, and they have a 13-year-old son, Jacob. They have two calico cats, Eva and CC (short for Cadillac Coupe deVille).

Her first car was a 1980 blue Dodge Omni. Her dad was an engineer for Chrysler so her family always had Chrysler cars while growing up.

Her hobbies include reading, traveling, needlework, and giving her husband a hard time when he insists on taking her hiking.

“My hopes for NASA are that we keep moving forward to the future when space exploration is a priority for the country and that we can meet our goals for human missions beyond Earth’s orbit,” Sills said.

**Steve Gersten** is the technical and administrative manager for the Control and Data Hardware Engineering and System Administration organizations on the Engineering Services Contract at Kennedy Space Center.

He manages a team of hardware engineers and system administrators who design, develop, deploy, test and sustain the Launch Control System hardware in the Launch Control Center Firing Rooms, the Multi-Payload Processing System, and the mobile launcher system in support of GSDO.

Gersten began his career at Kennedy 36 years ago as an electrical engineer with Computer Sciences Corp. He moved to Grumman Technical Services in 1983 and then to United Space Alliance in 1996, providing hardware and project engineering services to the Space Shuttle Launch Processing System for each.

“The coolest part of my job is seeing the hardware systems we envision come to fruition, and the team working together to design, procure, assemble and successfully activate these systems,” Gersten said.

One of the achievements he is proud of is developing the new systems engineering console enclosures in Firing Room 1 for the Space Launch System. Some of the

consoles from Firing Room 4 were modified and repurposed for FR1, which saved a lot of design time and cost.

He first became interested in space when he was 11, during a family trip to Florida and Kennedy Space Center. That trip and viewing the Apollo 11 moon landing a few years later cemented his attrac-



tion to space exploration.

Gersten’s hometown is Columbus, Georgia, just outside Fort Benning.

He earned a Bachelor of Science in electrical engineering in 1979 from Southern Polytechnic State University in Marietta, Georgia, and a Master of Science in technical management in 1994 from Embry-Riddle Aeronautical University in Daytona Beach, Florida.

He and his wife Cindy will celebrate their 36th anniversary in July. They have two daughters, Jennifer, 28, and Michelle, 25. They also have a cat named Jessie.

“She owns the house, but lets us stay there,” Gersten joked.

His first car was a 1970 green AMC Gremlin. He installed a CB radio with two co-phased antennas on the roof rack and went by the CB handle “Colorado Kid,” even though he had an FCC license ID.

Some of his hobbies include golfing and fly fishing. He and Cindy were lucky enough to attend the final round of the 2016 Masters Golf Tournament.

“My hope for NASA’s future is success and renewed national interest in space exploration,” Gersten said, “to keep a place at the table as the world leader in space-related technological development and accomplishment.”

# Employee Spotlight - Ed Stanton

Ed Stanton is a systems engineer in the Orion Production Operations group within the Ground Systems Development and Operations Program, and also is part of the Orion Program. The program is responsible for helping Lockheed Martin build the spacecraft.

Stanton has worked at Kennedy Space Center for almost 11 years. He began in the ISS Payload Processing Directorate, focusing on Node 2, and then moved over to the Orion Production Operations group, where he has been since 2007.

“The coolest part of this job is being able to walk out into the Operations and Checkout Building high bay and watch the Orion spacecraft come together,” Stanton said. “Basically, it arrived as an empty shell, and then all the wires, cables and tubes, all the structures and thermal panels are added. It’s an amazing feat. It’s like a puzzle. All the pieces have to go on in a specific order.”

His proudest achievement, to date, is seeing the launch of EFT-1 happen and watching the successful mission unfold.

“It was a great feeling to have been a part of the team that helped make that mission happen,” Stanton said.

“I always wanted to work at Kennedy because this is the place where everything gets launched from. All the action



happens here,” Stanton said.

Stanton is originally from Madison, Connecticut. He moved to Florida in July 2005 and has been here ever since.

He graduated from the University of Southern California in 1990 with a Bachelor of Science in aerospace and from the University of Houston in 1994 with a master’s in mechanical engineering. Then he earned a second master’s degree, in aerospace engineering, from the University of Southern California in 2002.

“My big hope for NASA’s exploration missions is to have humans on the surface of the Red Planet. Then ultimately, an outpost on Mars would be an absolutely amazing feat,” Stanton said.

His first car was a green station wagon that was nicknamed the “vacation-mobile,” because it looked just like the station wagon in the

movie “Vacation.”

He has one son, Austin, 21, who is attending college at the University of Southern California. He also has an Irish terrier named “Sheena.”

Some of Stanton’s hobbies include kiteboarding, windsurfing, wakeboarding, snowboarding, traveling, reading science fiction books and watching science fiction movies.



*NASA’s crawler-transporter 2 (CT-2) began its trek March 22 from the VAB to Launch Pad 39B at Kennedy Space Center to test recently completed upgrades and modifications to support NASA’s journey to Mars. CT-2 moved along the crawlerway at no more than one mile per hour and completed its journey to the pad after numerous scheduled stops along the way to verify the operation of the completed upgrades. The Ground Systems Development and Operations Program oversaw upgrades to the crawler in the VAB. The crawler will carry the mobile launcher with Orion atop the SLS rocket to Pad 39B for Exploration Mission 1. CT-2 is one of two crawlers built in 1965 for the Apollo program and also carried space shuttles for 30 years. CT-1 and CT-2 have travelled more than 5,000 miles during their 50-plus years in service for NASA’s space programs. Photo credit: NASA/ Kim Shiflett*