

National Aeronautics and Space Administration



# LAGNIAPPE

John C. Stennis Space Center

Volume 9 Issue 12

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December 2014



# Liftoff!!

(See pages 4-5)



**Goal – \$195,000**

**To-date – \$130,972**

\*as of 12/16/14

**(67% of goal)**

*“I feel very blessed to be part of such an incredible team and family. I look forward to 2015 with eager anticipation and excitement.”*

From the desk of

**Jerry Cook**

Deputy Director, Stennis Space Center



**T**is the season! Once again, the holiday season is upon us. For me, it is a time to rest, reflect, rejoice and recharge before beginning a new year. It has been a year of changes, successes, hardware failures and new milestones at the center.

We have seen the culmination of years of dedication and devotion as the J2-X engine team completed the successful development phase of testing a new-generation rocket engine. The team and hardware set new standards with application of the NASA Data Acquisition System as the primary data system, which will continue to serve the Space Launch System (SLS) RS-25 engine program and Stennis for years to come. Renovation of the B-2 Test Stand maintains its steady progress toward the historic test of the SLS core stage, planned for late 2016. With final construction and activation of the A-3 Test Stand, Stennis also delivered on its commitment to build the world-class test facility.

We continued our partnerships with the commercial space sector, helping the nation to expand the limits of robotic and human space exploration. We continue to test the SpaceX Raptor thruster on the E-2 Test Stand. The RS-68 engine program completed a successful year of testing, including delivery of the three engines that lifted the Orion capsule on its test flight to an altitude of about 3,600 miles before it re-entered the atmosphere and landed in the Pacific Ocean. Testing of the AJ26 engine was suspended after an engine failure earlier this year, but the team's resilience was unwavering during the failure investigation and reconstruction of the test position. Due to the recent Antares launch failure, we are standing down in testing for now. Meanwhile, the process continues toward the approval of an enhanced restricted airspace policy for Stennis.

Recently, a team of NASA engineers won one of the

first Early Career Initiative efforts awarded by the Space Technology Mission Directorate. Our Applied Science and Technology Project Office team has continued to press forward with completion of coastal applications efforts, while diversifying its portfolio.

The Synergy-Achieving Consolidated Operations and Maintenance (SACOM) contract team is nearing completion of the acquisition process to combine Stennis Space Center and Michoud Assembly Facility existing test operations and facility operations contracts, as well as integrating the Michoud operations contract. Stennis saw implementation of multiple efforts presented at the completion of the Strategic Roadmap Team last year. We also implemented a reorganization of offices to help us be even more successful in the way we operate. The federal city continues to evolve, and the INFINITY Science Center is looking forward to an exciting 2015 as it expands its venue with the recent announcement of the Deepwater Horizon Natural Resources Damage Assessment funds.

Finally, the results are in, and NASA maintains its No. 1 position in the “Best Places to Work” survey among large federal agencies. Stennis was the best place out of all of the NASA centers for the third year in a row.

As I reflect on the past year, I feel very blessed to be part of such an incredible team and family. I encourage each of you to take time to rest, reflect, rejoice and recharge in your own ways. Have a safe and joyous holiday season. I look forward to 2015 with eager anticipation and excitement. Merry Christmas!

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## FULFILLING NASA'S EXPLORATION MISSION

# Chill test sets stage for RS-25 testing



NASA engineers at Stennis Space Center took a major step Dec. 11 towards hotfire testing of RS-25 rocket engines that will help power the new Space Launch System (SLS) on missions to deep-space destinations. A-1 Test Stand operators at Stennis completed a chill test of developmental engine No. 0525, clearing the way for hotfire testing to begin in 2015. A chill test is a full-dress rehearsal for hotfire testing. During the test super-cold rocket propellants are flowed through stand and engine piping to ensure there are no problems with delivery. RS-25 engines are fueled by liquid hydrogen and liquid oxygen, which flow at temperatures reaching less than -400 degrees Fahrenheit. During the chill test, engineers monitor such things as temperatures, pressures, and flow rates of the propellants. They also seek to verify the steps of the chill procedure and accurately gauge the amount of time needed to chill the pumps and engine for hotfire tests.

Such data is studied to make any needed adjustments and to prepare the hotfire test sequence and requirements. A similar test was conducted earlier in the year without an engine installed. Liquid nitrogen was flowed through newly installed piping as a preliminary test of its design. Modification of the A-1 Test Stand for RS-25 testing has been under way for more than a year. Various stand components and configurations had to be changed to enable RS-25 testing. RS-25 engines are remaining space shuttle main engines, which have been modified for the SLS vehicle. A configuration of four RS-25 engines will power the SLS core stage. In addition to conducting development and acceptance testing of individual RS-25 engines on the A-1 stand, NASA engineers are making preparations to test the SLS core stage configuration with four RS-25 engines on the B-2 Test Stand at Stennis.



## FULFILLING NASA'S EXPLORATION MISSION

# NASA's new Orion spacecraft completes 1st spaceflight test

**N**ASA marked a major milestone Dec. 5 on its journey to Mars as the Orion spacecraft completed its first voyage to space, traveling farther than any spacecraft designed for astronauts has been in more than 40 years.

“The flight test of Orion is a huge step for NASA and a really critical part of our work to pioneer deep space on our Journey to Mars,” NASA Administrator Charles Bolden said. “The teams did a tremendous job putting Orion through its paces in the real environment it will endure as we push the boundary of human exploration in the coming years.”

Orion blazed into the morning sky at 6:05 a.m. CST, lifting off from Space Launch Complex 37 at Cape Canaveral Air Force Station in Florida on a United Launch Alliance Delta IV Heavy rocket. The launch was powered by a trio of RS-68 rocket engines tested by Aerojet Rocketdyne on the B-2 Test Stand at Stennis. The port side engine, No. E20044, was tested Aug. 13, 2013. The center engine, No. E20032, was tested April 16, 2013. The starboard side engine, No. E20043, was tested Jan. 17, 2013. The Orion crew module splashed down approximately 4.5 hours after launch in the Pacific Ocean, 600 miles southwest of San Diego.

During the uncrewed test, Orion traveled twice through the Van Allen belt where it experienced high periods of radiation, and reached an altitude of 3,600 miles above Earth. Orion also hit speeds of 20,000 mph and weathered temperatures approaching 4,000 degrees Fahrenheit as it entered Earth's atmosphere.

Orion will open the space between Earth

The U.S. Navy's USS Anchorage moves into place to recover NASA's Orion spacecraft following its splashdown in the Pacific Ocean on Dec. 5. Orion launched into space on a two-orbit, 4.5-hour test flight at 6:05 a.m. CST on Dec. 5, and returned safely to Earth, where a combined team from NASA, the Navy and Orion prime contractor Lockheed Martin retrieved it for return to shore. The spacecraft was transported back to shore on board the Anchorage. It was off loaded at Naval Base San Diego on Dec. 8 to undergo preparations for a cross-country trip back to Kennedy Space Center in Florida. The successful mission was hailed as a major milestone in the country's return to deep-space exploration. The Orion spacecraft is designed to allow astronauts to journey to destinations never before visited by humans, including an asteroid and Mars.

and Mars for exploration by astronauts. This proving ground will be invaluable for testing capabilities future human Mars missions will need. The spacecraft was tested in space to allow engineers to collect critical data to evaluate its performance and improve its design. The flight tested Orion's heat shield, avionics, parachutes, computers and key spacecraft separation events, exercising many of the systems critical to the safety of astronauts who will travel in Orion.

On future missions, Orion will launch on NASA's Space Launch System (SLS) heavy-lift rocket being developed at the agency's Marshall Space Flight Center in Huntsville, Alabama. A 70 metric-ton SLS will send Orion to a distant retrograde orbit around the moon on Exploration Mission-1 in the first test of the fully integrated Orion and SLS system.

“We really pushed Orion as much as we could to give us real data that we

can use to improve Orion's design going forward,” said Mark Geyer, Orion Program manager. “In the coming weeks and months we'll be taking a look at that invaluable information and applying lessons learned to the next Orion spacecraft already in production for the first mission atop the Space Launch System rocket.”

A team of NASA, U.S. Navy and Lockheed Martin personnel aboard the

USS Anchorage recovered Orion and returned it to U.S. Naval Base San Diego. Orion will be delivered to NASA's Kennedy Space Center in Florida, where it will be processed. The crew module will be refurbished for use in Ascent Abort-2 in 2018, a test of Orion's launch abort system.

Lockheed Martin, NASA's prime contractor for Orion, began manufacturing the crew module in 2011 and delivered it

in July 2012 to the Neil Armstrong Operations & Checkout Facility at Kennedy where final assembly, integration and testing were completed. More than 1,000 companies across the country manufactured or contributed elements to Orion.

For more information about the Orion spacecraft, its exploration flight test and the Journey to Mars, visit online at: <http://www.nasa.gov/orion> and <http://go.nasa.gov/1pVQu0S>.



# Mission success!



(Left photo) The United Launch Alliance Delta IV Heavy rocket, with NASA's Orion spacecraft mounted atop, lifts off at 6:05 a.m. CST, Dec. 5.  
 (Top middle photo) Stennis Space Center employees gather to watch the return and splashdown of the Orion spacecraft after its 4.5-hour mission.  
 (Bottom middle photo) Stennis employees view a replay of the EFT-1 launch from Cape Canaveral Air Force Station's Space Launch Complex 37.  
 (Top right photo) Stennis Engineering & Test Directorate Director Randy Galloway speaks with Stennis employees during an Orion viewing event.  
 (Middle right photo) A camera in the window of NASA's Orion spacecraft looks back at Earth during its uncrewed flight test in orbit Dec. 5.  
 (Bottom right photo) Recovery team members in rigid-hulled inflatable boats approach NASA's Orion spacecraft after its splashdown in the Pacific Ocean.

## FULFILLING NASA'S EXPLORATION MISSION



(Above photo) Work progresses on the high-pressure industrial water project at Stennis Space Center. The project involves replacing and upgrading full sections of large piping that provide water to Stennis test stands, a critical need during hotfire testing of rocket engines.

(Right photo) Water piping is installed near the B-1/B-2 Test Stand at Stennis Space Center. The project to replace and upgrade the center's high-pressure industrial water system is a key milestone in preparations to test the core stage of NASA's new Space Launch System on the B-2 stand.



## NASA water system project upgrades critical SLS support system

The average household faucet flows about two gallons of water per minute through a half-inch pipe. Imagine the pipe it would take to flow 335,000 gallons per minute.

That is exactly the “faucet” NASA will use to supply needed water for testing the core stage of its new Space Launch System at Stennis Space Center. Work is under way to replace and upgrade the 50-year-old high-pressure industrial water system at the center to ensure its capability. The Center Operations Directorate project managed by NASA engineer Karma Snyder is a mission critical effort to replace full sections of large piping, as well as several large gate valves. An additional pump also is being installed to help increase water flow for testing the SLS core stage. NASA is developing the SLS vehicle to carry humans and other payloads deeper into space than ever.

Water is a critical element for rocket engine testing. At Stennis, engines are anchored in place on large test stands and fired just as they are during an actual space flight. The fire and exhaust from the test is redirected out of the stand by a large flame trench.

Testing of the SLS core stage on the B-2 Test Stand at Stennis will involve a lot of fire and exhaust as four RS-25 engines are ignited simultaneously, producing more than 2 million pounds of thrust. A water deluge system will direct much of the 335,000 gallons of water flowing to the stand every minute to cool the exhaust.

In addition, about 87,000 gallons of water a minute will be used for vibro-acoustic suppression, essentially creating a curtain of water around the engines to dampen the loudness of the test and

protect the core stage from noise damage. Water also must be available on the stand and to the adjacent barges – which supply cryogenic rocket propellants to fuel the engine during the test – for fire suppression in the event of a mishap.

In the early days of testing during the 1960s and 1970s, well water was pumped to the stands to meet those needs. In the 1980s, water began to be diverted from the nearby manmade canal system into a 66-million-gallon reservoir. Large pumps deliver the water from the reservoir to the test stands through underground pipelines.

Those pipelines have degraded with age. The 96-inch-diameter line from the reservoir to the B Test Complex is being replaced. Work on that phase will be completed by summer 2015, which means it will be in place in time to support testing

of the SLS core stage the following year. The HPIW project also involves replacing a portion of line servicing the A Test Complex and several 66-inch gate valves used to control water flow. Completion of that work is scheduled in 2016.

The new piping is fabricated from carbon steel and includes inner and outer linings that will help protect it from corroding elements. The new gate valves also represent a material and design upgrade for the system.

The original Stennis system was built to deliver more than 300,000 gallons of water a minute at 300 psi. The system had to be upgraded to enable additional water flow needed for the SLS core stage. A pump is being added that will increase flow by 25,000 gallons a minute. “Vibro-acoustic suppression was something we had not origi-

nally planned for,” explained Rick Rauch, who is managing renovation work on the B-2 stand to prepare it for SLS core stage testing.

In addition to installing equipment needed for vibro-acoustic suppression, the configuration of flame trench holes to deliver water during testing had to be redesigned to optimize flame deflector cooling. It is no small task, involving more than 32,000 holes that must be plugged and re-drilled to form a new spray pattern tailored to the core stage rocket exhaust plume.

On test day, the “faucet” will be turned on, and water will flow. The average American household uses about 100,000 gallons of water, inside and outside use, each year. During an SLS test, the B-2 Test Stand will use that much water every 18 seconds.

## FULFILLING NASA'S EXPLORATION MISSION

## NASA in the News

### NASA ranks as 'Best Place to Work'

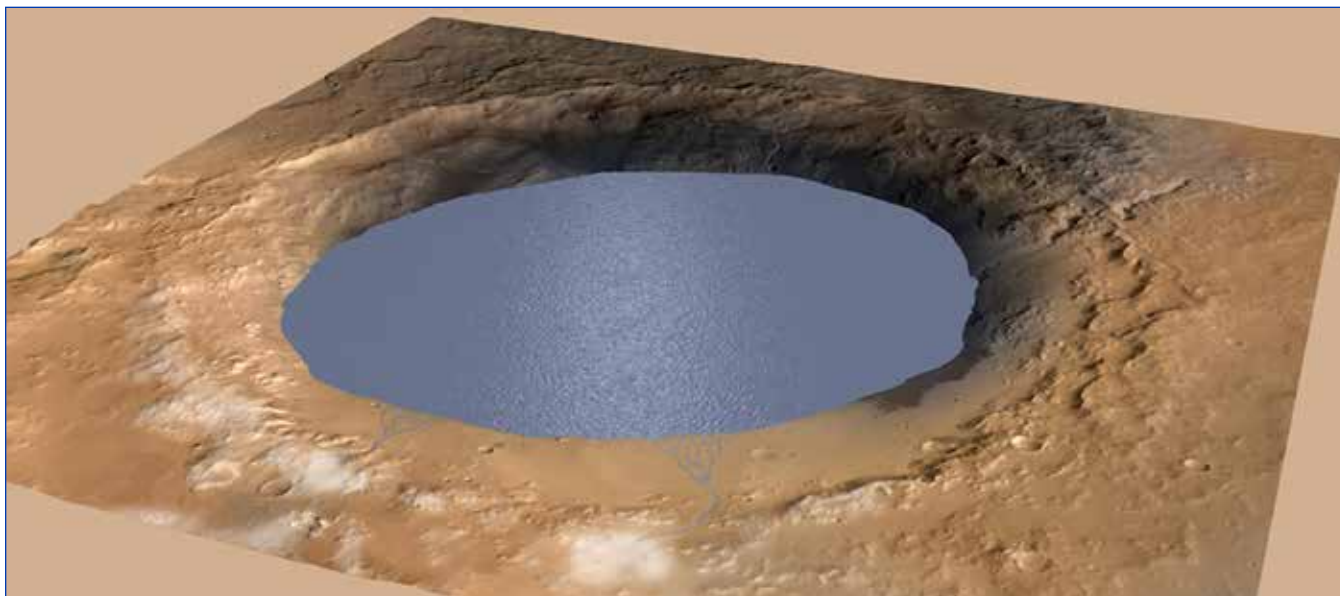
For the third year in a row, NASA has been ranked as the best place to work in the federal government, based on results of the ninth annual employee survey conducted by the Partnership for Public Service. In the same survey, Stennis space Center ranked as the best place to work among NASA centers. It also ranked fourth out of 315 as the best place to work in the federal subcomponent category. "Those of us who work at NASA know it's a great place to work," NASA Administrator Charles Bolden said. "We are the world leader in space exploration and cutting-edge science missions and contribute to the economic vitality of our great nation. We challenge our employees to carry out missions that benefit humankind. What job could be better than that?" The 2014 workplace survey involved almost 393,000 civil servants at more than 389 federal organizations, which were ranked according to overall employee satisfaction and commitment, as well as on 10 additional workplace issues. For the complete rankings, visit: <http://bestplacestowork.org>.

### NASA focuses on climate change

Five new NASA airborne field campaigns will take to the skies starting in 2015 to investigate how long-range air pollution, warming ocean waters, and fires in Africa affect our climate. These studies into several incompletely understood Earth system processes were competitively-selected as part of NASA's Earth Venture-class projects. Each project is funded at a total cost of no more than \$30 million over five years. This funding includes initial development, field campaigns and analysis of data. The five selected Earth Venture investigations focus on atmospheric chemistry and air pollution, ecosystem changes in a warming ocean, greenhouse gas sources, African fires and Atlantic clouds, and melting Greenland glaciers. Seven NASA centers, 25 educational institutions, three U.S. government agencies and two industry partners are involved in the projects. For more information about NASA's Earth science activities, visit online at: <http://www.nasa.gov/earthrightnow>.

*For NASA news releases, visit: [www.nasa.gov/news/releases/latest/index.html](http://www.nasa.gov/news/releases/latest/index.html).*

## Curiosity finds clues regarding water on Mars



This illustration depicts a lake of water partially filling Mars' Gale Crater, receiving runoff from snow melting on the crater's northern rim. Evidence of ancient streams, deltas and lakes that NASA's Curiosity Mars rover mission has found in the patterns of sedimentary deposits in Gale Crater suggests the crater held a lake such as this more than 3 billion years ago, filling and drying in multiple cycles over tens of millions of years. Gale Crater is 96 miles in diameter. The land surface in this illustration is the area's modern shape. Three billion years ago, the rim would have been higher and less eroded. A large layered mountain, Mount Sharp, now stands in the middle of Gale Crater. Accumulation of sediments in lakes, deltas, streams and wind-

blown deposits is proposed to have formed the layers making up the lower portion of the mountain. When the crater first held a lake, it might have had a central peak, much smaller than Mount Sharp, formed as a rebound from the impact that excavated the crater. Such a peak might have appeared as an island in the lake. This illustration is based on elevation, image and color data from various Mars observations. The appearance of snow is added to simulate conditions billions of years ago. The lake fills the crater about to the elevation where Curiosity found lakebed sediments at the base of Mount Sharp. For more about the mission and the Curiosity rover, visit: <http://www.nasa.gov/msl> and <http://mars.jpl.nasa.gov/msl>.

# A year of 'deja vu all over again' for Stennis Space Center

As Yogi Berra famously quipped, 2014 was like "déjà vu all over again" for NASA's Stennis Space Center, the nation's largest rocket engine test complex.

Fifty years ago, the center was on the front lines of the nation's space program, testing rocket engines that eventually would carry humans to the moon. Five decades later, the center again is on the front lines of space exploration efforts, preparing to test rocket engines and stages that eventually will carry humans deeper into space than ever before.

"It is an exciting time to be at Stennis Space Center," Director Rick Gilbrech said. "A few years ago, we celebrated our golden anniversary with the theme of '50 years of powering dreams.' In 2014, we focused on 'turning dreams into reality.' That is exactly what this year has been about as we moved forward in our support of America's return to deep-space exploration. Stennis will test the very rocket engines and stages that will make those deep-space dreams possible. I could not be prouder to be here at this time."

The year clearly has been one of moving forward. An RS-25 rocket engine has been installed on the A-1 Test Stand at Stennis and undergone a preliminary chill test. RS-25 engines are modified space shuttle main engines that will be used to power the core stage of NASA's new Space Launch System vehicle. Hotfire testing of the RS-25 engine on the A-1 stand will begin in 2015.

Meanwhile, work continues on the B-2 Test Stand at Stennis to prepare for testing the SLS core stage in 2016. Testing will involve installing the actual flight stage on the stand and firing its configuration of four RS-25 engines simultaneously. Considerable work is being done to modify the stand from its Apollo-era configuration to enable the core stage testing.

On another NASA front in 2014, Stennis continued to test engines for the agency's Morpheus Project.

The center also continued to support commercial testing efforts. Engines tested on the E-1 Test Stand powered a pair of Orbital Sciences Corporation commercial cargo flights to the International Space Station in 2014. SpaceX conducted engine component testing on the E-2 Test Stand. The trio of RS-68 engines that powered the Dec. 5 launch of NASA's Exploration Test Flight-1 also were tested by Aerojet Rocketdyne on the B-1 Test Stand at Stennis. The EFT-1 test of NASA's new Orion space capsule flew deeper into space than any mission since the Apollo era. It is being celebrated as a major milestone for NASA's return to deep-space exploration.

The emphasis on promoting all aspects of NASA's mission continued during the year as well. The Stennis Applied Science and Technology Project Office provided critical scientific research for the Gulf of Mexico region, especially related to coastal preservation and restoration. The Office of Chief Technologist also worked to promote spinoff technologies, including three developed by Stennis engineers and recently awarded U.S. patents.

The Stennis Office of Education supported various efforts to promote science, technology, engineering and mathematics to students and the public. Other public efforts sought to promote understanding and awareness of all aspects of NASA's mission. In one event, Stennis hosted its first-ever NASA Social, welcoming two dozen social media enthusiasts onsite.

Near the end of the year, Stennis again welcomed news from the ninth annual Best Places to Work survey, which ranked the site at the top of all NASA centers and fourth among all federal subcomponents.

"There should be no doubt about the significance of Stennis Space Center, not only in terms of space exploration support but as a leading federal government workplace," Gilbrech said. "There also should be no doubt that the focus at Stennis is not resting on our achievements but building on them and continuing to move forward."



(Top photo) NASA Chief Scientist Ellen Stofan participates in a robotics demonstration with students from Gulfport High School during a visit to the Gulf Coast on Feb. 18-19. Stofan visited Stennis Space Center and the Gulf Coast to meet with area students, NASA personnel and media members during two days of activities.

(Top right photo) A longer derrick crane boom is lifted atop the B-2 Test Stand the week of Sept. 1. The existing boom had been removed during stand modifications in preparation for testing the core stage of NASA's new Space Launch System. The SLS core stage is taller than the Saturn stages tested on the stand during the Apollo era, necessitating derrick crane upgrades. In addition to strengthening the crane, the boom was extended an additional 50 feet.

(Bottom right photo) Stennis Director Rick Gilbrech updates community leaders and guests on the state of the center during a briefing event at INFINITY Science Center on Feb. 13. Gilbrech and other speakers presented information about ongoing work at the Stennis federal city, as well as future projects.







(Top photo) Students from area schools participate in a live downlink with astronauts aboard the International Space Station on Sept. 2 at INFINITY Space Center.



(Right photo) Students at Long Beach (Miss.) Middle School view a cryogenic demonstration by NASA engineer Jason Hopper during outreach activities conducted by Stennis Space Center on March 26.



(Top right photo) NASA and Space Exploration Technologies Corp. (SpaceX) cut the ribbon at the E-2 Test Stand at Stennis Space Center on April 21 to mark the beginning of a new testing partnership. SpaceX tests components of its methane-fueled Raptor rocket engine on the stand. Participants in the ribbon-cutting ceremony included Mississippi Gov. Phil Bryant, U.S. Sen. Thad Cochran of Mississippi, SpaceX President and Chief Operating Officer Gwynne Shotwell, U.S. Rep. Steven Palazzo of Mississippi and Stennis Director Rick Gilbrech.

(Bottom right photo) Young students enjoy hands-on activities during a one-day Astro Camp hosted by Stennis on March 15.





(Left photo) RS-25 rocket engine No. 0525 sits on the deck of the A-1 Test Stand on July 17 in preparation for installation and a series of hotfire tests.

(Right photo) Astronaut Jeanette Epps during a July 3 event speaks to visitors at INFINITY Science Center about the training astronauts undergo to serve as members of International Space Station expedition teams.

(Bottom left photo) NASA Administrator Charles Bolden (r) takes a selfie photo with Stennis Center Director Rick Gilbrech (center) and NASA Associate Administrator Robert Lightfoot during a Sept. 12 visit to the B-2 Test Stand at Stennis. Bolden praised the renovation work performed by Stennis' contract workforce on the B-2 stand, which is being prepared to test the core stage of NASA's new Space Launch System.

(Bottom right photo) The Orbital Sciences Corporation Antares rocket, with the Cygnus spacecraft onboard, launches July 13 on a resupply mission to the International Space Station. The launch was powered by a pair of AJ26 rocket engines tested at Stennis Space Center – engine No. 13, tested at Stennis on Aug. 8, 2013; and engine No. 14, tested at the center Nov. 19, 2013.



## NASA recognizes employees for flight safety



Several Stennis Space Center employees were recognized for their contributions to flight safety with NASA Space Flight Awareness (SFA) awards during a Dec. 16 onsite ceremony. Earlier in the month, the award recipients traveled to NASA's Kennedy Space Center in Florida for a Dec. 3 ceremony featuring astronaut Jim Kelly, a tour of the center and to participate in activities related to the launch of NASA's Exploration Flight Test-1 on Dec. 5. The unmanned NASA mission was the first flight of the new Orion capsule, a giant leap forward toward returning humans to deep-space exploration. The Orion spacecraft is being developed to take

humans farther into space than they have ever gone before. SFA recipients were: (l to r) Darryl Giveans (Aerojet Rocketdyne), Dion Lee (Lockheed Martin Test Operations Contract Group), Todd Gillis (Jacobs Facility Operating Services Contract Group), Kenneth Albright (NASA Shared Services Center), Kelly Boyd (A<sup>2</sup>Research) and Robert Gargiulo (NASA). Sarah Villa with ASRC Federal also received SFA recognition but was unable to attend the Dec. 16 ceremony. Award plaques were presented to recipients by Stennis Space Center Deputy Director Jerry Cook and NASA Shared Services Center Executive Director Mark Glorioso.



## Stennis hosts social media prior to EFT-1 flight

NASA social media visitors stand at the base of the B-2 Test Stand following a briefing on renovation work under way to prepare the stand for testing the core stage of the new Space Launch System vehicle. The social media group toured Stennis Dec. 3 in conjunction with the launch of NASA's Exploration Flight Test-1, which launched Dec. 5 to test the

new Orion spacecraft being developed to carry humans deeper into space than ever before. The visitors used social media to report on their Stennis experience, which included briefings and visits to the B-2 stand, the A-1 Test Stand and the Aerojet Rocketdyne engine assembly facility. They also participated in a NASA-wide simulcast during the day.

## Building 1200 built as nerve center of Stennis

*Note: For more than 50 years, NASA's John C. Stennis Space Center has played a pivotal role in the success of the nation's space program. This month's Lagniappe provides a glimpse into the history of the south Mississippi rocket engine test center.*

**B**uilding 1200 at Stennis Space Center was erected in the mid-1960s. It was known as the Central Control Building (CCB), the nerve center of the site, serving as headquarters for safety and security control for the entire test area. It also contained facilities for monitoring and supervising activities by two-way voice communication.

Original dimensions of the two-story concrete-and-steel structure were 55 feet wide and 186 feet long, with an observation tower. The construction contract for the CCB at NASA's then-Mississippi Test Operations was awarded to C.H. Leavell and Co. and Peter Kiewit Sons' Co., a joint venture out of El Paso, Texas. The contract was awarded Dec. 10, 1963, by the U.S. Army Corps of Engineers, Mobile District, construction agent for MTO, then a division of the Marshall Space Flight Center in Huntsville, Alabama.

On April 23, 1966, the day of the first static test of a Saturn V rocket booster, CCB's 90-foot observation tower was the center of activity for those outside the test control center, where the North American Aviation team conducted its countdown. The CCB was located 7,500 feet from the A-2 Test Stand, an ample distance for unprotected persons.

Dr. Wernher von Braun, world-renowned scientist and Marshall director, was largely responsible for this national rocket test site being built in Hancock County. Von Braun had personal input into the design of Building 1200. Its futuristic observation tower, which resembled a ship's



Progress proceeds in March 1965 on construction of Building 1200 at Stennis Space Center, once known as the Central Control Building.

conning tower was his idea of a good vantage point for engineers to study the tests and for media and important visitors to view the dramatic static firings at a safe distance. As the April 1966 countdown drew close to ignition of a rocket stage, von Braun and others climbed the stairs to view the test from the outside deck, where they could enjoy the full impact of the noise.

TV monitors were installed in the observation tower, where test observers gathered to witness the first static firing. A number of official visitors from Marshall, NASA Headquarters and the West Coast were present. Jackson Balch, director of the now-designated Mississippi Test Facility (MTF), invited a select group of community leaders and a large number of local and national press representatives to witness and record the test.

Von Braun noted the static-testing countdown was audible only to the engineers in the tower, with no adequate way for public visitors to follow the proceedings. He said, "Jack, always remember, it pays to advertise!" Shortly afterward, von

Braun sent his best artists and model makers to MTF to design and build colorful exhibits for the Central Control Building. Several thousand dollars were spent for the public benefit in extending the wiring that carried the countdown voice to all parts of the building. Von Braun's efforts in 1966 were the beginnings of a public visitors center that was housed in the CCB for a number of years.

In observance of NASA's 40th Anniversary on Oct. 23, 1998, the "conning tower" at the visitors center officially was named after von Braun. During numerous trips to the center for meetings and to view static firings of the Saturn V first- and second-stage rockets, von Braun became a regular visitor to the building and watched many tests from the exotic tower. Eventually, the enclosed portion was equipped with closed circuit television monitors, where engineers could see the action on all points of the test stands.

In April 2012, the Stennis visitors center relocated, along with some exhibits, to the newly designed INFINITY Science Center near the Hancock County Welcome Center.

## Office of Diversity and Equal Opportunity

# Stennis options for workplace disputes

**W**orkplace grievances, misunderstandings, concerns and/or complaints may arise. Employees may pursue resolution if there is a belief they have not been treated reasonably and fairly. Resolution may be sought through one of these options:

**Equal Employment Opportunity (EEO) Complaints Process.** The Stennis process can be used to address allegations of discrimination based on race, color, religion, sex (including sexual harassment), national origin, disability, age, sexual orientation, genetic information or retaliation for prior EEO activity. Employees should contact the Office of Diversity and Equal Opportunity (ODEO) within 45 days of an alleged discriminatory action. Contact ODEO Complaints Manager Brian Hey at 228-688-1249.

**Conflict Management Program (CMP).** CMP is designed to help organizations maintain the open and effective lines of communication needed to optimize mission success at all levels. CMP provides managers and employees with conflict management tools and techniques to explore sources of conflict and to create an environment in which effective methods of communication and engagement are utilized. Contact Brian Hey at 228-688-1249.

**Anti-Harassment Program.** NASA defines harassment/harassing conduct as any unwelcome conduct, verbal or physical, based on such factors as race, color, gender, national origin, etc. when: (1) The behavior can reasonably be considered to adversely affect the work environment or (2) An employment decision affecting the employee is based on the employee's acceptance or rejection of such conduct. Employees who believe they have been the subject of harassing conduct must report the matter immediately to their supervisor or to center Anti-Harassment Coordinator Tim Pierce at 228-688-1630.

**NASA Grievance System.** The NASA Grievance System may be used to address any issue of employee concern or dissatisfaction in which resolution is possible and which is under the control of NASA management. There are limited exceptions. Contact the Office of Human Capital at 228-688-2337.

**Ombuds.** The NASA Ombuds Program works as an informal, independent, confidential and neutral means of communicating and facilitating the resolution of safety, organizational performance and mission-related issues without fear of retaliation. At Stennis, the Ombuds listens to an employee's issues, explores options and weighs the pros and cons of various options for resolution. The Ombuds helps the employee to determine the focus of their concern and prepares the individual to communicate effectively regarding his/her issue. The Ombuds also follows up to make sure appropriate action is taken. The program is available for both civil servants and contractors. Contact Karen Vander at 228-688-3054.

**Employee Assistance Program (EAP).** The EAP offers confidential evaluation, counseling, education and referral services to Stennis civil servants, on-site contractors and their families. Services are free. The objective is to provide assistance to those experiencing personal problems that they or their supervisors feel are affecting job performance or productivity. These problems may range from depression, anxiety, family/marital discord and other emotional issues to alcohol abuse or chemical dependencies. Contact Porter Pryor at 228-688-3005.

**Protective Services.** The Stennis Office of Protective Services (OPS) provides for security conditions and protection of personnel, information, property and operations. In emergencies, dial 911 from any site phone for the OPS dispatch or 228-688-3636 from a mobile phone.

**NASA OFFICE of Inspector General (OIG).** NASA and NASA contractor employees are encouraged to alert the OIG to crime, fraud, waste and mismanagement in NASA's programs. The OIG Hotline offers a confidential means for reporting. The OIG may be contacted at 202-358-1220 or at 800-424-9183. The OIG also has a Whistleblower Protection Ombudsman for allegations of retaliation against employees who "blow the whistle."

**Safety and Mission Assurance.** Safety at Stennis is everyone's responsibility. When one suspects or sees an unsafe or unhealthy condition or hazard in the workplace, communicate the concern and try to resolve the problem.

## Hail & Farewell

### NASA welcomes the following:

Valerie Buckingham

Public Affairs Specialist

Office of Communications

Sandra Jones

Management Support Assistant

Safety and Mission Assurance Directorate

Celena Thomas

Student Intern

Office of Human Capital

## ForWarn tool selected for national climate toolkit

**F**orWarn, the satellite-based forest disturbance monitoring system developed through partnerships between Stennis Space Center's Applied Science and Technology Project Office, the USDA Forest Service and other federal and university partners, was selected as one of the "top 25" tools included in the U.S. Climate Resilience Toolkit launched Nov. 17 of this year for the White House by an interagency team that included members from several

federal agencies and others.

The Toolkit "provides resources and a framework for understanding and addressing climate issues that impact people and their communities."

Monitoring systems like ForWarn are available in the Toolkit and can be used to help manage climate-related risks and opportunities, as well as to help guide communities in building resilience to extreme events.

ForWarn was developed to help natural resource managers rapidly detect, identify and respond to unexpected changes in the nation's forests using web-based tools.

The ForWarn system provides a near-real-time overview of vegetation greenness to help detect changes across landscapes impacted by insects, diseases, wildfires, extreme weather or other natural or human-caused events.

## Prof views demonstration of Stennis technology

NASA mechanical engineer Bruce Farner (l) demonstrates a desktop prototype of his patented conical seat shutoff valve for Kimball Marshall from Alcorn State University in Alcorn, Miss., during a Nov. 13 visit to Stennis Space Center. Under a Space Act Agreement between Stennis Space Center and the university, master of business administration students at Alcorn will develop a business plan for the shutoff valve as an entry into an academic competition. In addition to viewing the working desktop model, Marshall also viewed a stainless steel prototype manufactured at Stennis. NASA recognized Farner earlier this year with a patent award trophy for his valve technology.



## Stennis lights holiday tree

Stennis Space Center Deputy Director Jerry Cook (l) joins other NASA employees to celebrate lighting of the center's annual holiday tree in the Roy S. Estess Building on Dec. 6. Participants enjoyed caroling and refreshments during the annual lighting ceremony.



# INFINITY hosts Orion sleepover, launch-day activities for area kids

Fourth- and fifth-grade students enjoyed a night and day of activities related to the launch of NASA's Orion spacecraft Dec. 5. INFINITY Science Center hosted about 150 students, teachers, parents and chaperones for the sleepover event Dec. 4-5. Stennis educators provided a variety of space-related activities. Students from the Gulf Coast and as far away as an hour participated in the event, which featured Apollo 13 astronaut and Biloxi native Fred Haise (far right top photo). Haise spoke about his experiences during the Apollo 13 mission in 1970 and answered questions from students. An Aerojet Rocketdyne commentator augmented NASA-TV coverage during the early morning launch of the Exploration Flight Test-1 on Dec. 5, explaining countdown features, such as launch holds and delays. NASA visitor relations staff and INFINITY volunteers also provided live science and space presentations for students, who were able to tour INFINITY exhibits and interactive features, like Science on a Sphere. The event attracted media and social media coverage, culminating mid-morning Dec. 5.

