



LAGNIAPPE

John C. Stennis Space Center

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Cook named deputy director

NASA announced Dec. 20 that

Jerry Cook has been selected as the deputy director of Stennis Space Center, the agency's primary test-ground for rocket engines and propulsion systems, and its systems engineering center for applied science activities.



Cook served as the associate program manager of the Space Launch System (SLS) Program Office at NASA's Marshall Space Flight Center in Huntsville, Ala. He has served in a dual role as manager of the SLS Program Planning and Control Office.

He began his NASA career in 1985 as a test engineer at Marshall. While at Marshall, he worked his way up to hold various management-level positions, including manager of the Space Shuttle Main Engine Project Office.

"I am confident Jerry's leadership and rocket propulsion test experience make him an excellent fit as Stennis deputy director," Stennis Director Rick Gilbrech said following the announcement.

Cook has a bachelor's degree in mechanical engineering from the University of Alabama. The recipient of numerous awards, he has received NASA's Exceptional Service Medal and two NASA Exceptional Achievement Medals.



Preparing to test

The A-1 Test Stand team has begun modification work in preparation for gimbal testing of the next-generation J-2X engine this summer. See page 3 article.

“Our talented and innovative workforce has a proven record of excellence, and we will come together again to make it another banner year for Stennis Space Center and the agency.”

From the desk of
Rick Gilbrech

Director, Stennis Space Center



Happy New Year! I hope everyone enjoyed a safe and happy holiday with family and friends and got some well-deserved rest in anticipation of a busy and exciting 2013.

We certainly ended 2012 on a high note. The Office of Personnel Management recently released the results from the 2012 Employee Viewpoint Survey, and I am proud to say NASA topped the list in the large agency category of Best Places to Work in the Federal Government, and Stennis Space Center ranked first among the field centers and second overall out of 292 agency subcomponents. What a great way to start a promising new year!

Many of you probably followed the fiscal cliff debate that dominated the press over the holidays. Consistent with the NASA administrator’s message to us earlier this month, our day-to-day operations remain unchanged. We all have important and exciting work to attend to here while our elected officials continue their budget discussions in Washington, so I am asking each of you to stay focused on the tasks at hand.

I would also like to begin the New Year by welcoming new Deputy Director Jerry Cook, who comes to us from Marshall Space Flight Center (MSFC) in Huntsville, Ala., where he was the associate program manager of the Space Launch System (SLS) Program Office. Jerry has an extensive background in the propulsion arena including serving as the manager of the

Space Shuttle Main Engine Program from May 2007 until the space shuttle retirement in July 2011.

After joining MSFC in 1985 as a test engineer, Jerry served as a test conductor for the Space Shuttle Main Engine Test Program. He also has worked at NASA Headquarters in the Space Transportation Directorate in several key roles and is the author of numerous technical papers and books on aerospace and propulsion. I am pleased to have Jerry join the Stennis family and look forward to introducing him to the workforce.

I know that working together in 2013, we will build on our past success with continued engine tests supporting the SLS. The Stennis team will continue to lead the way in commercial rocket testing and work with our partners in pursuit of applied science goals. We will complete one major construction project, the A-3 Test Stand, and start two new large construction efforts, the high-pressure industrial water refurbishment and the B-2 Test Stand restoration for SLS core stage testing, set to begin in 2017.

I look forward to a very challenging and successful 2013. Our talented and innovative workforce has a proven record of excellence, and we will come together again to make it another banner year for Stennis Space Center and the agency.

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FULFILLING NASA'S EXPLORATION MISSION

NASA preparing for gimbal testing of J-2X engine at Stennis

Just as an automobile shopper takes care to test drive a new vehicle to learn how it performs, NASA will conduct a critical “test drive” of its new J-2X rocket engine this summer at the agency’s Stennis Space Center in Mississippi

The summer test drive of the engine involves gimbal testing, which has not been conducted at Stennis since the early 1990s. Gimbal testing is critical in ensuring J-2X engines can be rotated in a circular pattern as needed, essentially to steer a launch vehicle. Gimbaling an engine directs the thrust in order to maintain proper trajectory for the craft, just as movement of a steering wheel determines the direction of a car. In the case of a launch vehicle, movements are made with hydraulic actuators that push or pull an engine in a particular direction as needed. Once installed, J-2X engines must be able to gimbal five degrees along any point of a circular pattern.

“The challenge is to test as you will fly,” explained Jeff Henderson, director of Stennis’ A-1 Test Stand, where the next-generation J-2X engine will undergo gimbal testing later this year. “We want to duplicate everything that engine will be asked to do during a flight.”

Data from testing at Stennis will validate the engine’s gimbal performance. The J-2X developmental engine, E10002, will be installed on the A-1 Test Stand in late spring 2013. It then will undergo weeks of careful testing to show that it can be gimballed in the directions and at the speeds needed and that it can be held in any location for as long as needed. Before actual testing, however, the A-1 team will spend the next few months completing needed modifications to the test stand.

“It’s a different type of testing and requires a lot of precise preparation,” Henderson said. “It’s also very important because it will supply data on how the engine will perform in actual flight.”

Testing any rocket engine is a complicated process. Gimbal testing is even more so since it involves a myriad of actuator controls and functions and more intricate test piping. Also, typically an engine is fired without gimbaling so the thrust remains in only one direction, focusing the stress to one area on the test stand. In gimbal testing, engine thrust will be pointed in multiple directions as the engine moves, which will stress multiple areas of the test stand. Thus, the stand test team must ensure that the facility is prepared in a number of

ways to withstand the stress.

For instance, the hotfire thrust produced by the engine is deflected by a massive steel trench, which is flooded by as much as 150,000 gallons of water during a typical test. The water cools the engine hotfire and produces a huge billowing white steam cloud high in the sky over Stennis, which is visible from miles away and is characteristic of many engine tests

When an engine is fired in only one direction, it is a far simpler matter to focus the water flow. As an engine is gimballed, the thrust will hit the deflector in different locations. Now, it becomes more complicated to ensure the deflector is able to withstand the stress and the flow of water is directed as needed.

*“This is frontline work ...
We are literally making
the space missions of
tomorrow possible.”*

— Jeff Henderson

“There are a number of such things that we have not asked this stand to do for years,” Henderson said. “So, an important part of the process is to perform checks and make sure we are prepared for the new requirements.”

The test stand went through a similar, but more involved, process when NASA’s Space Shuttle Program ended and a transition was made from testing space shuttle main

engines to testing J-2X powerpack assemblies. The current process is not as extensive because it can build on work already performed. Nevertheless, the list of actions ahead is comprehensive and pages long.

Once the J-2X engine arrives, the actuators needed for gimbaling also must be attached. The engine then must be installed to the cryogenic flow ductwork. Because the engine will be moving, test team members must ensure that the ducts and piping – which are feeding high-pressure rocket propellants – are flexible enough to move with it.

It all adds up to many variables. Henderson, nevertheless, is confident his team will meet the challenge. “This is frontline work on a new engine and new actuator system,” Henderson summarized. “We have to show they will work as needed so we can fly as needed. We are literally making the space missions of tomorrow possible.”

The J-2X engine, built by Pratt & Whitney Rocketdyne of Canoga Park, Calif., will power the upper stage of NASA’s Space Launch System, managed at the Marshall Space Flight Center in Huntsville, Ala.



Sunrise frames the historic A-1 Test Stand at Stennis Space Center. Modifications are being made to the stand to enable gimbal testing of the next-generation J-2X rocket engine this summer. NASA engineers recently completed testing of the J-2X powerpack assembly on the stand.

PWR earns Contractor Excellence Award

NASA's Stennis Space Center presented its highest honor for quality and performance, the Contractor Excellence Award, to Pratt & Whitney Rocketdyne (PWR) for its commitment to teamwork, safety, customer service, and technical and managerial excellence at the center.

PWR is based in Canoga Park, Calif., with operations in several other locations as well, including an engine assembly facility at Stennis Space Center. The company is a leader in rocket engine manufacturing and developed the space shuttle main engine, which powered 135 shuttle missions from 1981 to 2011.

PWR also is developing the J-2X engine that will help power NASA's new Space Launch System vehicle on deep-space missions. The company also develops engines for military rockets and missiles.

The Contractor Excellence Award was presented to PWR during a Jan. 10 ceremony at Stennis. The Stennis Contractor Excellence Award was



Stennis Space Center Director Rick Gilbrech (right) presents the 2012 Contractor Excellence Award to Mike McDaniel, general manager for Pratt & Whitney Rocketdyne at Stennis.

established in 2008 to recognize contractors, subcontractors or providers for outstanding performance during a three-year period.

Stennis Director Rick Gilbrech praised PWR for its support of the NASA mission. "The PWR team

is an invaluable partner in rocket engine testing and overall support of the space program," he said. "We celebrate their record of achievement and excellence and look forward to working together with them as the nation continues its return to deep-space missions."

Stennis 2012 Combined Federal Campaign

Stennis Space Center employees closed 2012 by exceeding their Combined Federal Campaign giving goal of \$196,300 by 9.7 percent. Employees contributed \$215,386 through the 2012 campaign. In addition to exceeding the giving goal, the final tally marked the second consecutive year employees gave more than \$210,000 through the campaign.

The CFC is the largest annual workplace charity effort. Each year, its gifts support organizations providing health and human service benefits throughout the world.

For the 2012 campaign, 107 Stennis employees qualified as Bronze Eagle contributors with gifts of \$480 to \$1,000 through the campaign. Forty-eight employees gained Silver Eagle status with gifts of \$1,001 to \$2,000. Seven employees were Golden Eagle contributors, giving more than \$2,000 through the campaign.



Goal – \$196,300

Gifts – \$215,386

(109.7% of goal)

Stennis hosts business 'meet & greet'

The Stennis Space Center Office of Procurement and the Mississippi Enterprise for Technology (MSET) hosted an onsite "meet & greet" event Dec. 7 designed to introduce local small businesses to contract awardees so their products and services might be used to address future work orders.

Participants included various small businesses and the awardees from the Multiple Award Construction Contracts (MACC), the Architect and Engineer (A/E) Services contracts, and the Facility Operating Services Contract (FOSC) at Stennis.

"The MACC and A/E contract awardees will be performing the majority of work in those two areas at Stennis for the next five years, but no one is certain what the specific tasks might be," Stennis Small Business Specialist Michelle Stracener explained. "The 'meet & greet' gave these prime contractors the opportunity to identify subcontractors that might help them efficiently perform on work orders. We want them to be aware of what products and services are available from local companies."

The event was the first of its kind at Stennis and allowed contractors to collect information on local capabilities. It also provided an opportunity for small businesses to introduce themselves to prime contractors involved in key areas of work at the rocket engine test facility.

"It's a win-win situation," MSET President and Chief Executive Officer Charles Beasley said. "The prime contractors will know which local companies they can look to for support, and those local companies have the opportunity to support work at Stennis."

Last fall, NASA awarded contracts in architect and engineer services to S&B Infrastructure Ltd. and CDM-CH2M Hill JV, both large businesses.



Business representatives and Stennis contractors visit with one another and collect information on work opportunities and available services during a "meet & greet" event at Stennis on Dec. 7. The event was hosted by the Stennis Office of Procurement and the Mississippi Enterprise for Technology.

During the same quarter, NASA announced 10 winners of MACC contracts. Two of those were large businesses, Harry Pepper and Associates Inc. and Sauer Inc.

Eight small businesses also were awarded MACC contracts: ADVON Corp.; American Contractor and Technology Inc.; Birmingham Industrial Construction; D.M.P. Inc.; Healthon Inc.; McClain Contracting; MOWA Development, LLC; and Southeast Cherokee Construction Inc. Jacobs Technology Inc. is the prime contractor for FOSC work at Stennis and also attended the recent "meet & greet" to collect information on small businesses that can help meet their contract goals. All NASA contracts awarded to large businesses have substantial goals for small business subcontracting.

More than 150 attendees registered for the recent event. The majority of companies attending were from the local area, representing Louisiana to the Florida panhandle. Others traveled to the event from as far as California and New York.

Feedback from the exhibiting contractors was very positive. "The event provided a great opportunity to network with members of the center and surrounding business community," ADVON Corp. representative Bill Graham said. "There was a great turnout, and the preliminary planning and communications really made it easy to access the facility and set up for the event. The networking opportunity will go a long way in assisting us with business contacts as we prepare for the upcoming construction projects on the space center."

The view was echoed by Jason Edge, who serves as MACC contracting officer at Stennis. "The recent Stennis Space Center Multiple Award Construction Contract will have a significant impact on the strategic NASA mission of the Space Launch System," he said. "This valuable procurement mechanism will not only streamline the procurement process for future SSC construction projects, but it will also be a valuable tool in the event Stennis experiences another major disaster, such as Hurricane Katrina."



NASA tests Curiosity's Dust Removal Tool

This image from the Mars Hand Lens Imager (MAHLI) on NASA's Mars rover Curiosity shows the patch of rock cleaned by the first use of the rover's Dust Removal Tool. The first use of the tool was on the 150th Martian day, or sol, of the mission (Jan. 6, 2013). MAHLI took this image from a distance of about 10 inches; the patch of the rock from which dust has been brushed away is about 1.85 inches by 2.44 inches. The Dust Removal Tool is a motorized, wire-bristle brush designed to prepare selected rock surfaces for enhanced inspection by the rover's science instruments. It is built into the turret at the end of the rover's arm. In particular, the Alpha Particle X-ray Spectrometer and the Mars Hand Lens Imager, which share the turret with the brush and the rover's hammering drill, can gain information after dust removal that would not be accessible from a dust-blanketed rock. For more information about the Martian mission, visit www.nasa.gov/msl and <http://mars.jpl.nasa.gov/msl>. Follow the mission on Facebook at: www.facebook.com/marscuriosity and on Twitter at: www.twitter.com/marscuriosity. (Image Credit: NASA/JPL-Caltech/MSSS)

NASA in the News

SLS passes major milestone

The team designing America's new flagship rocket has successfully completed a major technical review of the vehicle's core stage. NASA's Space Launch System (SLS) will take the Orion spacecraft and other payloads beyond low-Earth orbit, providing a new capability for human exploration. The core stage preliminary design review was held Dec. 20, 2012. "We are on track toward meeting a 2017 launch date," said Tony Lavoie, manager of the SLS Stages Element at Marshall Space Flight Center in Huntsville, Ala. The first flight test of the SLS will feature a configuration for a 70-metric ton lift capacity and carry an uncrewed Orion. The SLS core stage will be built at NASA's Michoud Assembly Facility in New Orleans. To learn more, visit: www.nasa.gov/sls.

NASA seeks to 'green' skies

NASA's Environmentally Responsible Aviation (ERA) Project is moving forward with research efforts to "green" the skies. ERA is developing aircraft concepts and technologies to help reduce the impact of aviation on the environment during the next 30 years. The project is focused on five areas – aircraft drag reduction, weight reduction, fuel and noise reduction, emissions reductions, and fuel consumption and community noise reduction.

Movie examines neutron star

The latest movie from NASA's Chandra X-ray Observatory is better than the first, released in 2003. It features a deeper look at a fast moving jet of particles produced by a rapidly rotating neutron star, and may provide new insight into the nature of some of the densest matter in the universe. For Chandra images and information, visit: www.nasa.gov/chandra and <http://chandra.si.edu>.

For the latest NASA news, visit online: www.nasa.gov/news/releases/latest/index.html.

1970 – Stennis prepares for future

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 highlights a moment in the history of the south Mississippi rocket engine test center.

When the Apollo Program drew to a close during the early 1970s, NASA and several other agencies moved a variety of research and technical activities – primarily related to Earth resources and the environment – into the modern facilities available at the Mississippi Test Facility (MTF), now Stennis Space Center.

NASA activities at the time included developmental testing of the space shuttle main engine and opening of the Earth Resources Laboratory.

Forty-three years ago this month, on Jan. 20, 1970, NASA Administrator Thomas Paine appointed a special task force for study of the potential utilization of the MTF facilities by other federal agencies and departments.

About five years after he was appointed manager of MTF in 1965, Jackson Balch chaired the task force. Balch and then-Mississippi Sen. John C. Stennis shared a vision to expand MTF's single mission of testing the Apollo/Saturn V space vehicle boosters to encompass studies of the weather, the oceans and the land masses on Earth.

During the Apollo Program, the two men's hard work resulted in an economic boom for communities surrounding MTF. However, a time of transition had arrived.

Employing more than 6,000 people in the summer of 1965, the facility experienced a dramatic decline in employment to slightly more than 900 when the Apollo Program ended in the early 1970s.



Jackson Balch (left) walks with Sen. John C. Stennis (center) and NASA Acting Administrator George Low during a busy and well-remembered day at the Mississippi Test Facility (now Stennis Space Center) in November 1970. A host of NASA Headquarters officials, agency heads and members of Congress came to south Mississippi for an Apollo Awards Ceremony that turned into an all-day business session with the future of the installation being the main topic of conversation.

As NASA's test site manager, Balch collaborated with Stennis regarding his strategy to attract more businesses not only to help defray operational expenses, but also to keep the site in full use. Balch's strategy included involving the Mississippi-Louisiana congressional delegations, which had ties with state universities and governments, to support his idealistic mission.

The U.S. Coast Guard became the first federal agency to join NASA at MTF in 1970. Serving as headquarters for a program to develop automated data buoys, the agreement between NASA and the Coast Guard provided the "blueprint" for other agencies to share knowledge as well as costs while they pursued their own independent projects at the facility.

Office of Diversity and Equal Opportunity

Here is to the New Year – and its resolutions

*Twenty years from now, you will be more disappointed
by the things that you didn't do than by the ones you did do.*

So throw off the bowlines.

Sail away from the safe harbor.

Catch the trade winds in your sails.

Explore. Dream. Discover.

Mark Twain

How diverse are you in your thinking, the way you plan things out, what you want to accomplish most in your life and what is important to you?

Statistics show that most of us who make New Year's resolutions never quite accomplish them. Yet, 60 percent of people make the same resolution the following year. Why are we addicted to resolutions we should know are unlikely to succeed? New Year's resolutions are an expression of hope. They aren't an action plan for the future; they are an emotional strategy for today. Research shows that setting a resolution immediately puts people in a better mood. They feel more confident, in control and hopeful. They have an opportunity to succeed, whether they do or not.

In all reality, most resolutions are unrealistically optimistic. People expect change to come easier and faster for them than for other people. We also expect to improve more in the future than we have improved in the past. So, the last diet didn't work? No matter, tomorrow is another day.

There is nothing wrong with being optimistic. We all want to have more willpower, motivation and energy than our present selves. And while this thinking may not be realistic, it isn't entirely foolish. The more optimistic we are about our future selves, the happier we are today and the more likely we are to succeed at all we do.

In fact, the science of happiness shows that anticipating good things, whether it's bringing new and diverse ideas to the team or reaching out to someone we might normally hesitate to get to know, is what changes the dynamics of the workplace and makes us better and stronger than before. Not only that, but the more positive we feel about our future selves, the more likely we are to do things to support our future selves' happiness.

So, go ahead and make your resolution, and make it big. Research shows that the average person makes a resolution five or six times before they succeed. Even if you're above average, you'll probably need a few attempts. So, savor the joy of resolving to change. Think how you might be more diverse in your approach at work this year.

And remember, even if you don't succeed, there is always next year.

While you're thinking about your future, remember that every day is brand new. You can start where you left off. Press forward, and take hold of your future. Forget about your failures, and move ahead.

Don't worry about tomorrow. It is something that can't be avoided. In fact, only about 8 percent of the things we worry about actually happen. Ninety-two percent of what we worry about never happens. Take care of what you can do today. You have enough on your plate with the concerns of the day.

Make every day count. Don't put off what you can do today. Reach toward your goals and push yourself a little harder each day.

Be sensitive to the needs of others. I know that can be a difficult concept to grasp. We don't live in a cave, and we all have something to offer others. Helping others is fulfilling and benefits you even more than the person receiving. Keep your thoughts positive. The power of life and death is in the tongue. Speaking life will encourage you and cause you to press forward. Pressing forward will cause you to get stronger, and you will see the results you're after.

Act on your dreams. It's okay to dream. Dream about being able to do the things you can't do right now. Without dreams and a vision, we cannot move forward in our work. Some of the most diverse thoughts have spawned concepts never before imagined.

Hail & Farewell

NASA bids farewell to the following:

Charlene Guin Accountant
Office of the Chief Financial Officer

Pennie Turner Management Support Assistant
Engineering & Test Directorate

William St. Cyr AST, Tech Management
Engineering & Test Directorate

And welcomes the following:

Aaron Mannion AST, Experimental Facilities Tech
Center Operations



Stennis kicks off 2013 *FIRST*[®] Robotics Competition season

Thirty-seven teams from Alabama, Florida, Louisiana and Mississippi high schools traveled to Stennis Space Center on Jan. 5 for the kickoff of the 2013 *FIRST*[®] (For Inspiration and Recognition of Science and Technology) Robotics season.

Participants watched a broadcast from *FIRST*[®] headquarters in Manchester, N.H., featuring *FIRST*[®] founder Dean Kamen, to learn their 2013 competition challenge. Teams also received parts kits they will use to build robots for the challenge.

The competition seeks to inspire students to pursue careers in science, technology, engineering and mathematics (STEM). Teams are given identical parts kits and six weeks to

build robots to compete in scheduled tournaments.

For this year's "Ultimate Ascent" theme, a pair of three-team alliances will compete on a 27-by-54-foot playing field equipped with goals. Teams will try to score as many flying discs into their goals as possible during a two-minute and 15-second match. Discs scored in higher hoops earn more points. Alliances also are awarded points for how high their robots can climb on a pair of pyramid structures on the playing field. A description and video simulation of the "Ultimate Ascent" game can be found online by searching keyword – FIRST Robotics.

Over 350 students, mentors and officials visited Stennis for the kickoff

event, the ninth year that the rocket engine test facility has hosted the season-opening event. Kickoff events also were held in 81 cities across the nation and world, attracting nearly 51,000 high school students. Kamen reminded the students, "*FIRST*[®] isn't about competing; it's about cooperating and recognizing that if you have the right tools, you'll be able to make this world a better place."

NASA and Stennis Space Center support *FIRST*[®] Robotics Competition with mentors, volunteers and contributions. Interested mentors should call Katie Wallace at 228-688-7744 or email katie.v.wallace@nasa.gov. The 2013 Bayou Regional *FIRST*[®] Robotics Competition is scheduled at the Pontchartrain Center in Kenner, La., on March 21-23.