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LAGNIAPPE

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SLS CORE STAGE TESTING

B-2 Test Stand on schedule

See page 4



One of the things I enjoy doing every so often is driving through the test area to see what kind of activity is under way. I especially like to pass by the B-1/B-2 Test Stand to see what changes are there. It is really taking shape! Some of the scaffolding has been removed, so you can see the NASA meatball painted on the south side of the stand. And looking at the new steel structure atop the stand, it is not hard to imagine the Space Launch System core stage installed and ready to testfire.

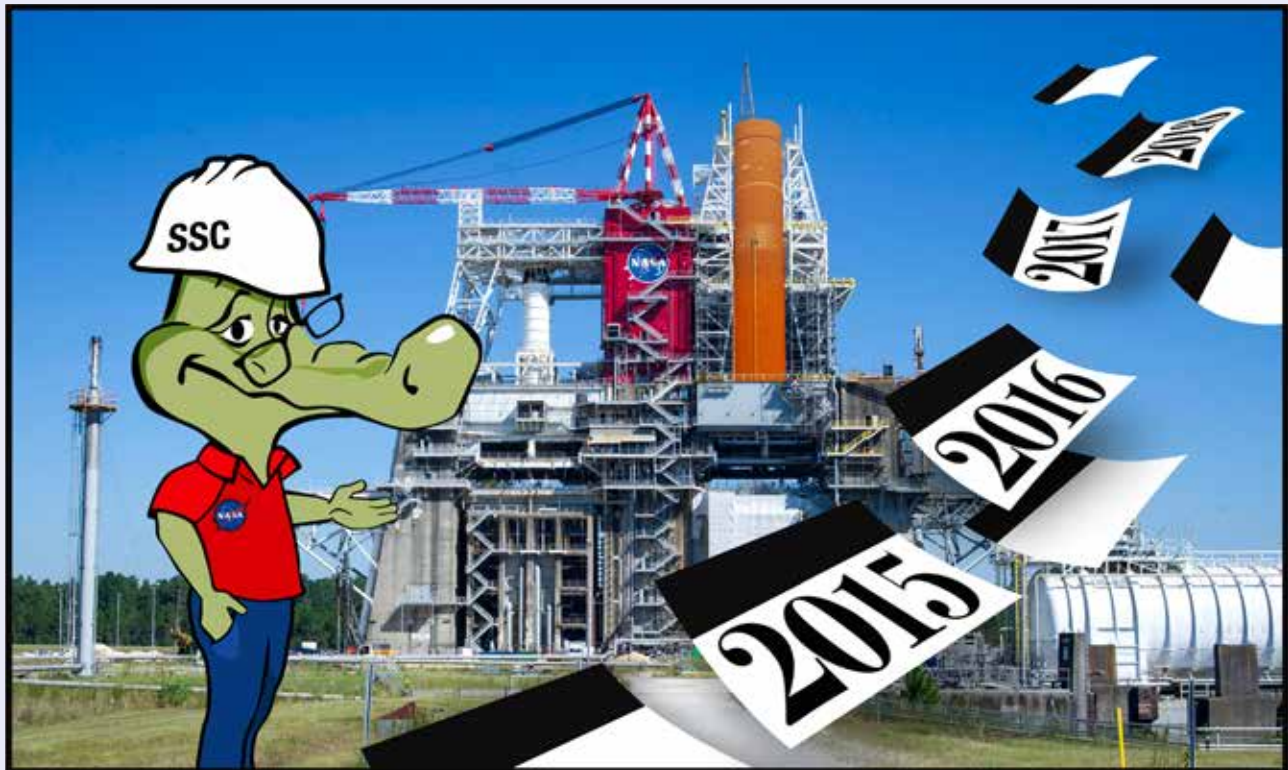
There is still work to be done before then, but a lot of the heavy lifting is over. Almost all of the major construction items have been completed, and major activation of the stand will begin next spring.

By May, NASA will deliver the “pathfinder” stage to the stand. The pathfinder is a full-scale test version of the actual core stage. It will be installed on the stand to make sure everything is ready for the flight stage. Think of it as a giant fit test, just like you would do before buying new clothes. You do not want to get home and find out those jeans are a bit too small, thanks to some design flaw, of course, because we have all worn the same size since high school. Ark!

Jeans and waist sizes aside, we certainly do not want to get ready to test the SLS core stage and find out the stand is not quite set up as needed. The pathfinder stage will make sure that does not happen.

Once the stand is ready, the SLS flight stage will be delivered. If the schedule holds, that could happen just about a year from right now. All eyes will definitely be on Stennis then – and what a sight they will see when all four of those stage engines finally fire up!

Before you start thinking that is a long way off, think about how fast days seem to fly by – yes, it is mid-October already. Einstein probably could explain it scientifically. The best idea I ever heard relates to age. When you are seven, a year represents one-seventh of your life, and it seems to take forever for holidays to arrive. As you age, a year represents a smaller and smaller fraction of your life. So, time seems to go by quicker. For me, that means each year represents one – well, who is counting? Let’s just say, the years are reminding me of NASCAR laps around Talladega. Ark! That makes me feel dizzy sometimes, but it also means the next great chapter in Stennis rocket engine test history is just “days” away. See you there!



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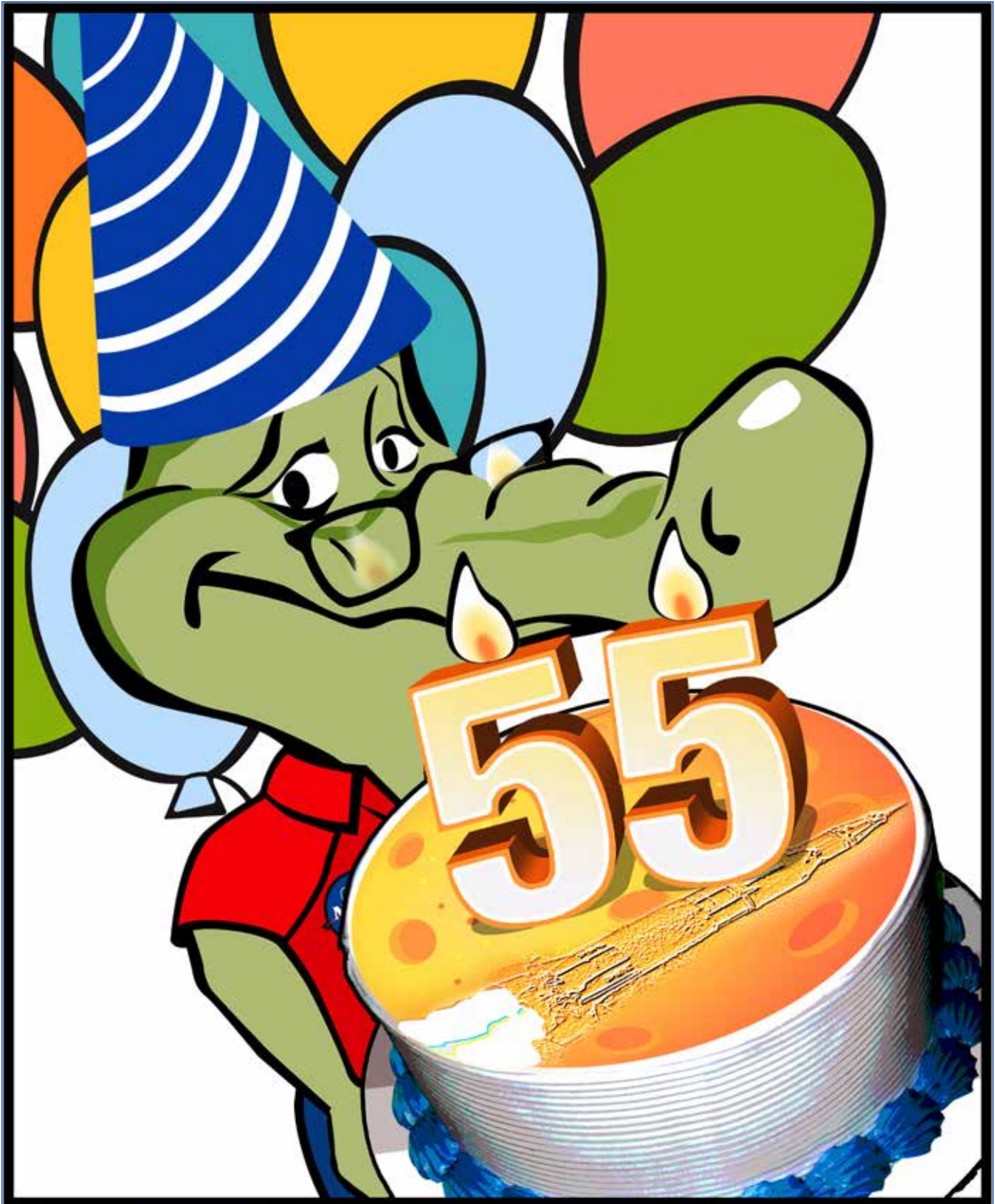
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Happy Birthday, Stennis!



On Oct. 25 1961, five months to the day after then-President John F. Kennedy challenged the nation to send humans to the moon, all eyes turned to south Mississippi. On that day, NASA announced plans to build a massive facility in the area to test the rocket engines and stages that would achieve Kennedy's goal. More than five decades later, the facility now known as

Stennis Space Center has grown into a sprawling federal city and a premier rocket engine test site, serving both NASA and commercial companies. At 55 years old and counting, there is no slowing of Stennis activity as it tests new Space Launch System rocket engines and stages that will carry the nation on its next great adventure into space, including to Mars.

FULFILLING NASA'S EXPLORATION MISSION

Closer than you think – B-2 Test Stand on schedule for Space Launch System core-stage testing

A visit to the B-2 Test Stand at Stennis Space Center leaves no doubt – NASA's return to deep-space missions is drawing closer by the day. And the days until the flight stage that will launch the return is tested at the site are fewer than one may realize.

Before launching the new Space Launch System vehicle on its Exploration Mission-1, NASA will deliver the core stage for the flight to Stennis for green-run testing. For the first time, the stage will be assembled with its four RS-25 engines, installed on the stand and test fired, just as during an actual launch.

Including evaluation and design phases, Stennis has been preparing the B-2 stand for core stage testing for five years and counting. It has been a busy time, but major construction projects are closing out and all is on schedule with just a year or so remaining, said Barry Robinson, manager of the B-2 Restoration and Activation Project at the site.

"Everything we're doing is part of the critical path for this mission," Robinson said. "And we'll be ready."

It has been an involved process. The B-2 Test Stand at Stennis was built to test the Apollo rocket stages and engines that carried humans to the moon. As NASA prepared to launch the Space Shuttle Program, the stand also played a key role in testing the vehicle's configuration.

Known as the Main Propulsion Test Article (MPTA) Project, a space shuttle external tank, simulated orbiter and three main engines were installed on the stand and fired just as during an actual launch. A series of tests from 1977 into the first month of 1981 proved the shuttle propulsion system would work as designed, clearing the way for the first mission launch in April 1981. Many engineers characterize the project as one of Stennis' "finest hours."

Now, the stand will provide a sequel of sorts with its test of the SLS core stage – with a very big difference. This is no SLS mockup; the stage to be tested will actually fly.

"That is significant," Robinson explained. "Because this will be an actual flight article, we have to exercise extreme care. This is an aggressive 'one-and-done' plan based on historical data and a no-fail philosophy."

The work to prepare the stand for the stage testing was divided into three phases: restoration of the stand to its original design condition, buildout of the stand to accommodate the larger SLS core stage and completion of the special test equipment interfaces (structural, mechanical and electrical) needed for testing.

Robinson and others on the B-2 Test Stand restoration team are paying heed to every detail to make sure all is ready to go for the stand. Major restoration and buildout efforts have been completed. Some of those were sizable, such as extending the derrick crane atop the stand by 50 feet, repositioning the 1.2-million-pound original shuttle MPTA framework structure, adding another 1 million pounds of steel to extend the structure to accommodate the larger SLS stage and upgrading the massive high-pressure industrial water system to provide as much as 335,000 gallons of water per minute to the stand during test operations.

A weekly summary of test complex activity shows only three of five original work packages still open. Much of the remaining work on those packages involves completing equipment systems and final punch list items. Necessary upgrade work continues at the high-pressure gas facility that supports test operations. Work on the test stand tarmac is scheduled for completion in December. All of the packages are expected to be closed out in the next few months.

Some subsystem activation work already has begun, but the major activation efforts will occur this spring. The goal is to be ready for the April arrival of the core stage "pathfinder," a full-scale mockup of the SLS core stage. It will be installed on the stand for a critical "fit test" to make sure the stand is configured as

needed for the actual core stage.

That will leave summer months to make any modifications that may be needed and to ensure all aspects of facility and test support systems are ready. The time is vital. The RS-25 engines that will power the SLS core stage are former space shuttle main engines, so Stennis has a long test history to build on in that respect. However, the SLS vehicle itself – and all of its configurations – is new, which poses challenges in preparing stand systems for testing.

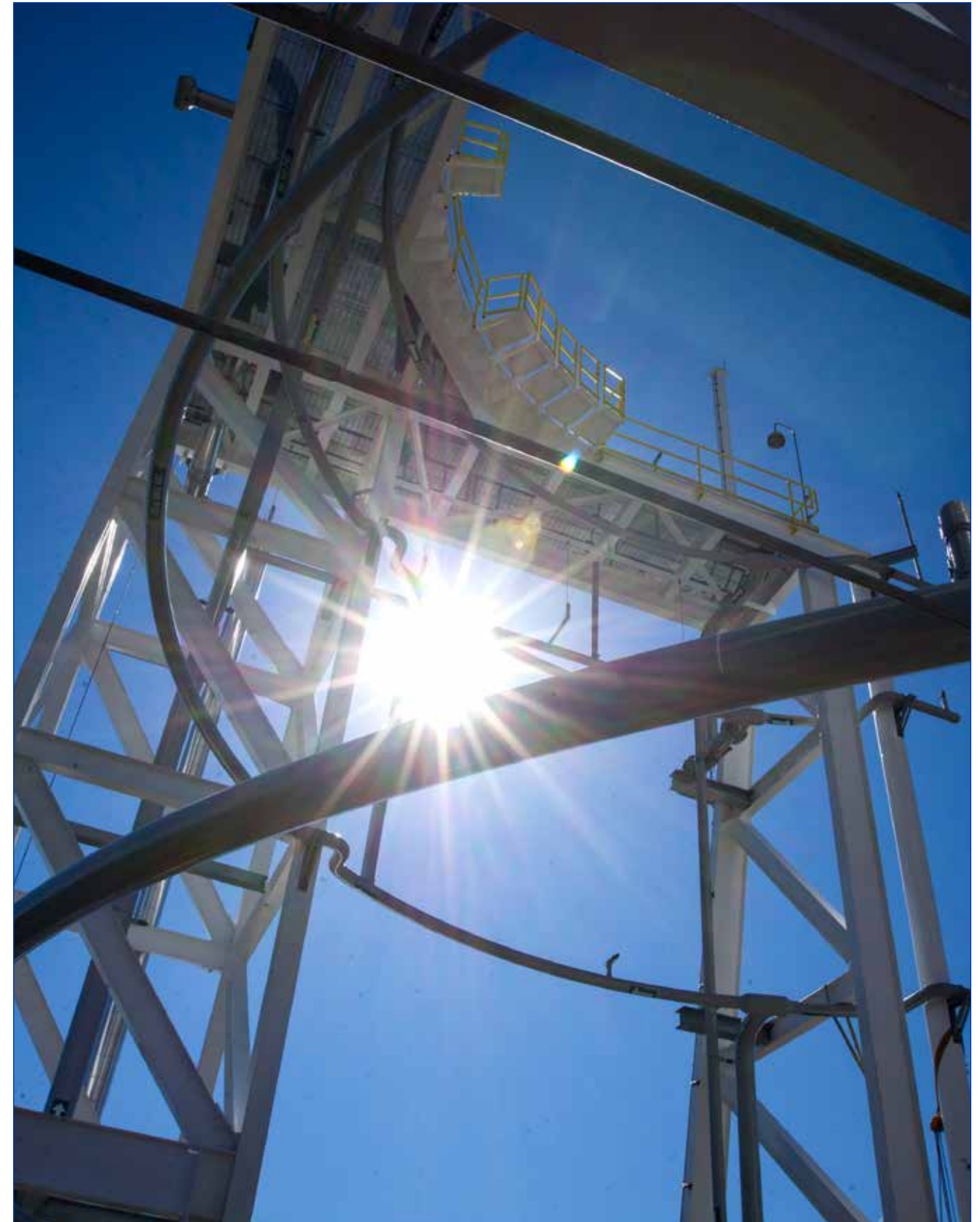
"The sooner we can complete activation and fit checks, the longer we will have to make sure all is set to go for testing," Robinson said. "And we will make sure Stennis is ready."

Once installed, the core stage will undergo chill-down and hot-fire tests.

If the schedule holds, the actual SLS core flight stage will be delivered to Stennis for testing next fall. The timing would be perfect from a historical standpoint. The first shuttle MPTA test was conducted 40 years earlier, in 1977, making 2017 a perfect time for Stennis to add another chapter to the B-2 Test Stand "finest hour" record.

***Everything we're doing
is part of the critical
path for this mission.
And we'll be ready.***

Barry Robinson

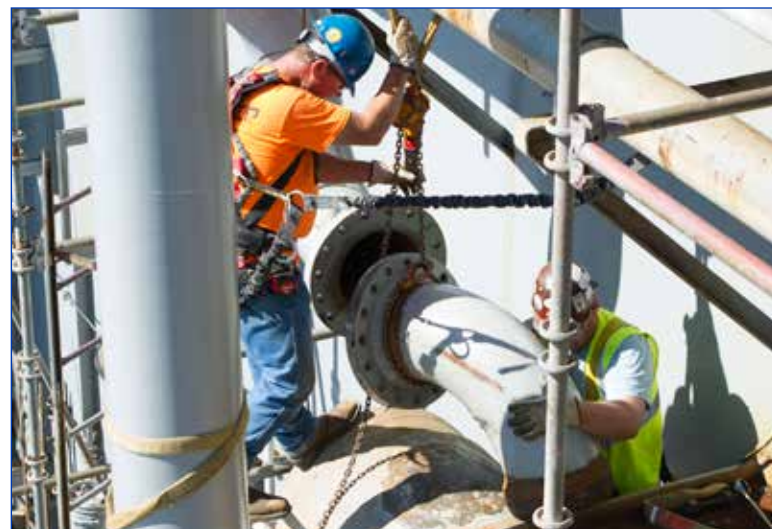
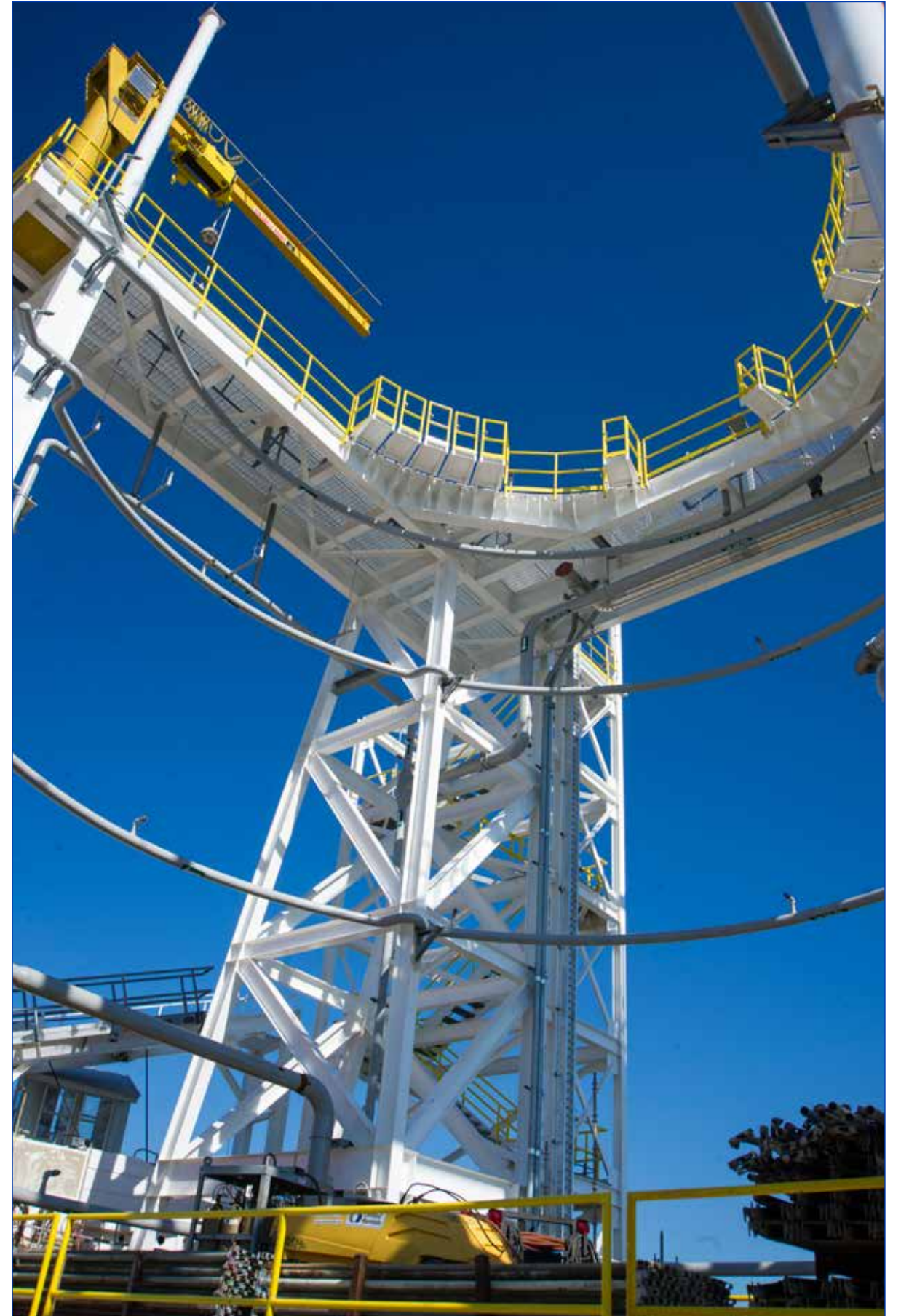


More than 1 million pounds of steel were added to the B-2 Test Stand to extend the framework structure that will hold the SLS core stage for testing.

FULFILLING NASA'S EXPLORATION MISSION



(Above photo) Several members of the B-2 Test Stand restoration team stand in front of the facility as their project grows closer and closer to completion. Major construction projects are closing out at the stand as work continues to complete equipment systems and punch list items. All areas of the stand have been affected by preparations for Space Launch System core stage testing. The changes are visible in new piping and the large steel superstructure built to house the SLS core stage for test firing.





Curiosity begins its next chapter of exploration on Mars

This self-portrait of NASA's Curiosity Mars rover shows the vehicle at the "Quela" drilling location in the "Murray Buttes" area on lower Mount Sharp. The scene combines approximately 60 images taken by the Mars Hand Lens Imager (MAHLI) camera at the end of the rover's robotic arm. Most of the component images were taken on Sept. 17, 2016, during the 1,463rd Martian day, or sol, of Curiosity's work on Mars. The view does not include the rover's arm nor the MAHLI camera itself, except in the miniature scene

reflected upside down in the parabolic mirror at the top of the mast. The rover, which landed on the Mars surface in August 2012, already has achieved its primary mission goal by finding environmental conditions that could have been favorable for microbial life on the planet. On Oct. 1, it began a two-year extension of its mission to explore a mineral-rich area about one-and-a-half miles from its previous location. More about Curiosity is online at <http://www.nasa.gov/msl> and <http://mars.jpl.nasa.gov/msl/>.

NASA in the News

NASA awards Stennis contract

NASA has awarded a contract to RiverTech, LLC, of Colorado Springs, Colorado, for a range of security services at the agency's Stennis Space Center near Bay St. Louis, Mississippi. The Stennis Protective Services Contract (SPSC) is a firm fixed-price contract that begins Oct. 1 and includes a one-month phase-in period, 23-month base period and three one-year options, to total five years. The contract has a potential total value of approximately \$25.5 million. The SPSC was awarded as an 8(a) small business set-aside, part of U.S. Small Business Administration (SBA) efforts to help small, disadvantaged companies compete in the marketplace. RiverTech is an SBA-certified 8(a) Alaskan Native company. RiverTech will provide security services that include physical security, security operations, personnel security, access control, badging, 911-dispatch center, access monitoring, traffic control and locksmith services. These services will support Stennis in accomplishing institutional, program and project objectives for NASA, resident organizations, onsite contractors and onsite commercial tenants. For more about NASA and agency programs, visit: <http://www.nasa.gov>.

Hubble spots Europa activity

Astronomers using NASA's Hubble Space Telescope have imaged what may be water vapor plumes erupting off the surface of Jupiter's moon Europa. This finding bolsters other Hubble observations regarding the icy moon. The observation increases the possibility that missions to Europa may be able to sample Europa's ocean without having to drill through miles of ice. "Europa's ocean is considered to be one of the most promising places that could potentially harbor life in the solar system," said Geoff Yoder, acting associate administrator for NASA's Science Mission Directorate in Washington. The plumes are estimated to rise about 125 miles before, presumably, raining material back down onto Europa's surface. Europa has a huge global ocean containing twice as much water as Earth's oceans, but it is protected by a layer of extremely cold and hard ice of unknown thickness. The plumes provide a tantalizing opportunity to gather samples originating from under the surface without having to land or drill through ice. For more, visit: <http://www.nasa.gov/hubble> and <http://hubblesite.org/news/2016/33>.

Access all NASA news releases online at: <http://go.usa.gov/3j3KW>.

Stennis hosts NASA chiefs of staff

Stennis Space Center hosted chiefs of staff from across NASA during a visit Oct. 5. During the day, the group toured the A-1 Test Stand, which tests RS-25 engines that will help power the new Space Launch System. Shown are: (standing, l to r) Jonathan Herczeg (NASA deputy chief of staff), Roberta Sherard (Armstrong Flight Research Center chief of staff), Mark Ruether (Kennedy Space Center chief of staff), Mike French (NASA chief of staff), Gail Robinson (Jet Propulsion Laboratory chief of staff), Karen Bradford (Ames Research Center chief of staff), Darryl Gaines (Johnson Space Center chief of staff), Phil Fluegemann (Ames executive officer); (kneeling, l to r) Johnny Stephenson (Marshall Space Flight Center chief of staff), Lori Manthey (Glenn Research Center chief of staff), Deborah Tomek (Langley Research Center chief of staff), Dennis Boccippio (director of NASA Office of Agency Council Staff), Anne Peek (Stennis chief of staff).



Stennis hosts 2016 Energy Awareness Day

Stennis Space Center employee Bertha Jackson learns about efficient use of electric power from Coast Electric Power Association representatives Tyler Green and Philippe Michel during Energy Awareness Day on Oct. 5. Stennis hosted a variety of area companies and organizations for the annual energy emphasis. Employees were able to visit exhibits to gather information and tips on various energy-related topics, such as conservation, energy efficiency, controlling energy costs and renewable energy.

Stennis event focuses on conflict resolution

Keith Davis, chief of marine patrol for the Mississippi Department of Marine Resources, talks with Stennis employees during a lunch-and-learn session Oct. 12. The session was sponsored by the Stennis Office of Diversity and Equal Opportunity as part of its Conflict Resolution Month emphasis. Davis spoke to employees on "How to Interact with Law Enforcement," offering tips on how to avoid confrontational encounters with police officers.



1972 – Dream of ‘scientific utopia’ comes true

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 NASA and the south Mississippi rocket engine test center.

Jackson Balch had a crazy dream for the Mississippi Test Facility (MTF). He wanted a “scientific utopia” created at MTF. He tried for years to establish state and federal agencies at the facility in order for agencies to work together on projects that would benefit not only each other, but the scientific community as a whole.

In 1972, Balch began to see his dream come to fruition. A few federal and state agencies began to move to MTF and brought together their resources and staff. The following year, 16 federal and state agencies and universities had moved to the facility and were able to work together on various projects, using data, sensors, computers and instruments that they would not have had access to by themselves.

Out of this “utopia” came cooperative projects, one of

which was the Skylab Oceanic Gamefish Project done by NASA and the National Oceanic and Atmospheric Administration (NOAA) in 1973. This project involved the Earth Resources Laboratory (ERL) and NOAA’s National Marine Fisheries Service Engineering Laboratory. The two agencies worked together, along with volunteer charter fishing boats, Skylab, the NOAA-2 satellite and NASA aircraft to gather information on how gamefish were associated to ocean features.

The ERL became the front runner in remote sensing and teamed up with other agencies and entities, like the states of Mississippi and Louisiana and the Department of the Interior Earth Resources Observations Systems (EROS), to research how remote sensing could help in resource management for the state governments.

Collaborative efforts like the Oceanic Gamefish Project and remote sensing projects done by the ERL and EROS office opened the door for other efforts combining local, state, and federal agencies as well as private industry to come together and benefit the scientific community.



A view of Skylab, the United States’ first space station, which was launched by NASA and flew in orbit from 1973 to 1979.

Office of Diversity and Equal Opportunity

Exciting times at the NASA Shared Services Center

This article was written by Mark Glorioso, executive director of the NASA Shared Services Center, located at Stennis Space Center.

It is hard to believe it has been two-and-a-half years since I was selected as the executive director for the NASA Shared Services Center (NSSC). To say that my new position has been exciting and enjoyable would be an understatement. Before my appointment, I did not fully understand the importance of the NSSC or the many ways in which it benefits NASA and its customers (all NASA centers). With that said, I am excited to share a brief overview of some things we have accomplished:

- The NSSC became operational March 1, 2006; its facility is a \$33 million Leadership in Energy and Environmental Design Silver Facility, funded and owned by the state of Mississippi; the center reports to the Mission Support Directorate at NASA Headquarters.
- The NSSC provides services in the areas of financial management, human resources, procurement, enterprise information technology (IT) and agency business support.
- The shared services delivery model is transparent in performance/cost, provides structured management of customer interactions and has a business intelligence infrastructure. Continuous improvement and innovation are at the core of this model.
- Baseline services transitioned over a three-year period, with more than 60 total activities transitioned to date.
- Agency investment was paid back within 4.2 years.
- Customer service ratings exceed 95 percent annually.
- NCCIPS, a Tier-3 Compliant Data Center, transitioned to the NSSC in April 2015, and is utilized by multiple federal agencies.
- The NSSC generated savings in excess of \$100 million in the first 10 years. Steady-state savings are in excess of \$20 million per year.
- The center has an average budgeted reduction of \$7.2 million per year as a result of the NSSC NextGen Contract award (Oct. 1, 2015).
- The most recent additions to the NSSC portfolio include: suitability and reinvestigations; workers/un-

employment compensation; and simplified acquisition threshold purchases.

I am excited about the new fiscal year as it promises to bring more transitions and opportunities for cost saving/reduction to the agency. What else is on the horizon? Well, if it is not rocket science, it probably belongs at the NSSC – so NASA scientists and engineers can better focus on the agency's core mission.

I am also excited because on Oct. 1, 2016, the NSSC began a partnership with the Stennis Office of Diversity and Equal Opportunity for collaboration and provision of diversity and equal opportunity programs and activities to Stennis and NSSC NASA employees. This comes at a time when NASA's associate administrator is urging centers to cooperate and become more interdependent. The arrangement makes sound business sense for both organizations, and the NSSC looks forward to this enhanced working relationship with colleagues next door.

Finally, and certainly related to this success story ... Did you know that intelligence and technical skills only predict 25 percent of success? Seventy-five percent of long-term job success is predicted not by intelligence and technical skills but by three other categories – optimism, social connection and the way one perceives stress.

NASA Deputy Associate Administrator Lesa Roe recently shared a TED Talk by Harvard researcher Shawn Achor on the power of positive psychology (a.k.a. happiness) and its impact on productivity and creativity. Often, people are told that success will make them happy, but Shawn's research indicates that it is just the opposite – happiness leads to success. This comes at just the right time to help us all change our mindset and refocus energy in a more productive and meaningful way. Think of the possibilities as you view the 12-minute TED Talk at: <https://www.youtube.com/watch?v=fLJsdqxnZb0>.

Hail & Farewell

NASA bids farewell to the following:

Rosa Obregon	AST, Mechanical Experiment Equipment	Engineering and Test Directorate
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NASA welcomes the following:

Ronald Bald	Attorney Adviser	Office of the Chief Counsel
Elizabeth Calantoni	AST, Safety and Mission Assurance	Safety and Mission Assurance Directorate
William Miltier	Information Technology Specialist	Center Operations Directorate
Bridget Moody	AST, Aerospace Environmental Control Tech	Center Operations Directorate



Faces of Stennis

Each month, Lagniappe will feature employees at Stennis Space Center whose work enables the center to fulfill its mission as the nation's largest rocket engine test center. This month's employees are highlighted on the following two pages.



Adrienne Peyton Ragan

Adrienne Ragan's earliest – and most influential – space-related memory was learning the story of Mae Jemison, a physician and NASA's first African-American female astronaut. In 1992, Jemison also became the first African-American woman to fly into space, as a science mission specialist on space shuttle mission STS-47. Inspired by that example, Ragan, married with two children, has gone on to carve out her own NASA career, serving as contracting officer of the Information Technology Services (ITS) Contract at Stennis Space Center. In that role, she works to ensure a multitude of ITS services are delivered accurately and on time. Ragan joined the NASA team in 2009 after working at Stennis with the Defense Contract Management Agency as a contracting specialist. Prior to that, she completed undergraduate

and graduate degrees and 11 years of service in the Army National Guard and Air Force National Guard. After leaving the military, the Biloxi native and D'Iberville resident naturally turned to Stennis. Very few places offer the benefits of Stennis, she points out, from the onsite daycare facility and services, to the interaction with other cultures, to the chance to develop long-lasting friendships, to the opportunities to develop and grow in one's field. Ragan is very proud of her work and committed to helping put government funds to good – and efficient – use. She also is excited about what lies ahead.

"What amazing accomplishments will NASA achieve?" she wonders. "What amazing technology changes are forthcoming? Where will we travel? What impact will come from all the research NASA will perform? I am most excited about the unknown, about all that is to come."



Michele Campbell

Michele Campbell cannot help but think of working at Stennis Space Center as a life-changing experience – because that is exactly what it has been for her. Twenty years ago, the Poplarville native was a single mother working two jobs, including as a waitress at a local restaurant. Late Stennis Director Roy Estess and his wife were among her regular customers. After learning of Campbell's situation, Estess suggested she explore a Welfare-to-Work program designed to help individuals prepare for and obtain gainful employment. Campbell applied to the program and was subsequently hired at Stennis in 1997 in the Human Resources Office, monitoring the Self-Paced Learning Center. Within the first two years, she was reassigned to the Office of the Chief Financial Officer, presumably on a temporary assignment. However, she

has remained in that office, where she currently is responsible for Stennis labor and payroll. She also serves as back-up for travel functions, as secretary for the Stennis Diversity and Inclusion Board and as treasurer of the NASA Exchange. She takes extreme pride in the work, as shown in her efforts to make sure payroll was delivered accurately following the government shutdown in 2013. Still a Poplarville resident, Campbell is now married with five children and three grandchildren. She had never really been interested in anything space-related until her high school marching band performed at Disney World in Orlando and toured the nearby Kennedy Space Center. Now, she loves the work and diversity of Stennis. "I've established some lifelong friendships that I cherish," she says "It is truly a blessing to work here."

