

## Gilbrech affirms importance of Stennis



Stennis Space Center Director Rick Gilbrech updates area leaders during a community briefing session at INFINITY Science Center on Feb. 18. Various Gulf Coast leaders attended the annual briefing, which also featured updates from Bill Burnett, deputy commander and technical director of the Naval Meteorology and Oceanography Command; Mark Glorioso,

executive director of the NASA Shared Services Center; and John Wilson, executive director of the INFINITY Science Center. In his remarks, Gilbrech emphasized the key role Stennis plays in supporting the American space program, cited the positive economic role Stennis plays in its area and assured leaders that the site is committed to growing its missions.



### Bolden reviews State of NASA

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*“You know, every action we take is important.  
It touches someone or changes something. ...  
We ought not to take that responsibility lightly.”*



**A**rk! I feel like Rip Van Winkle himself, who slept some 20 years to awaken and find the whole world changed around him. It has been almost that long since I last visited Stennis Space Center, making my last appearance as the summer of 1998 drew to its usual sweltering hot close. It was a real surprise – a real good one! – to receive an invitation from Director Rick Gilbrech to come back to the Stennis family as his guest columnist for 2016.

I jumped at the chance, since I was here at the start and now will be here to celebrate the 50th anniversary of the very first engine test at Stennis this year. I remember that test and everything that led up to it, like the mosquito invasion of '63. Goodness, the mosquitoes were so big you were never sure if it was a plane flying by your head or not. I saw a kid flying a drone in a field the other day and had flashbacks.

I remember 1965, too, when Hurricane Betsy decided to play an unwelcome visit and tried to undo a lot of the good, hard work we already had done. Through those years and others, I watched Stennis change names and grow until it became a city unto itself, home to all kinds of fine companies and groups. All in all, I was in and out and around this place for more than 30 years, though I kept a pretty low profile for the first 14 or 15 years. What an interesting time it was, with more stories than I could tell.

It is so good to be back. I kept up with Stennis happenings but still could not have imagined all the changes. Rip went to sleep in a British colony and woke up in a whole new United States. Walking around here and seeing all the new buildings and hearing about all the new projects and programs makes me understand a bit of how he must have felt.

But only a bit – because as much as everything has changed, the more I look around, the more I realize everything is the same. I mean, there are still people here with the same names as 50 years ago, second- and third-generation folk still doing good, hard work.

Sure, there are new agencies and organizations here now, but the “this-before-all-else” mission of the place remains the same as it was when we were starting – keep our space program flying.

I remember watching those Apollo and space shuttle launches with real pride. I was part of making them possible; everybody out here was, whether they were an engineer or custodian or accountant. It made no difference; they were a part of it because they were part of making this place possible – and this place made those flights possible.

A friend and I were fishing on the Pearl River out behind the Cypress House not too many years before I bid farewell for a season. We were talking about just that idea, and I said something he wrote down to remember. I came across it the other day while reading some of his letters. “You know, every single action we take is important,” I said. “It touches someone or changes something. And whether we realize it or not, we are the force behind all that this universe offers. We ought not to take that responsibility lightly.”

I cannot rightly say where the thought came from, except that nature has an inspiring way. I can rightly say we all understood we were part of something pretty important back then, and it made us work that much harder and walk that much taller for doing so.

It's good to see that has not changed.



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Contact info – (phone) 228-688-3749; (email) [ssc-pao@nasa.gov](mailto:ssc-pao@nasa.gov); (mail) NASA OFFICE OF COMMUNICATIONS,

Attn: LAGNIAPPE, Mail code IA00, Building 1100 Room 304, Stennis Space Center, MS 39529

Managing Editor – Valerie Buckingham

Editor – Lacy Thompson

Staff Photographer – Danny Nowlin

# Stennis set for busy 2016 test schedule

Get set for March to enter with plenty of roar as engineers at NASA's Stennis Space Center prepare for an active spring and summer of rocket engine testing.

"It's shaping up to be a busier-than-average year as far as testing goes," said Gary Benton, project management chief in the Stennis Engineering and Test Directorate. "We have several active test programs involving various test articles on different stands."

Scheduled projects for the remaining months of the 2016 fiscal year include:

- **RS-25 rocket engine tests on the A-1 Test Stand.** Within weeks, NASA will conduct its first test of an RS-25 flight engine (No. 2059) at Stennis, marking a major milestone in the agency's return to deep-space exploration and its Journey to Mars. The flight certification test will be followed by a series of developmental engine tests leading into fiscal year 2017.
- **RS-68 rocket engine tests on the B-1 Test Stand.** RS-68 engines have been tested at Stennis for more than 15 years in support of the United Launch Alliance Delta IV expendable launch vehicle. The test agreement continues this year.
- **Space Launch System (SLS) core stage testing on the B-2 Test Stand.** Stennis has worked for the past few years to prepare the B-2 stand for testing the core stage that will fly on the uncrewed SLS Exploration Mission-1 in 2018. Modification and activation of the stand will continue in upcoming months. Once completed, the SLS flight stage will be installed on the stand next year and tested by firing all four of its RS-25 rocket engines simultaneously, just as during an actual launch. The SLS vehicle is being developed by NASA to carry humans deeper into space than ever before, including such destinations as an asteroid and Mars.
- **AR1 testing on E-1 Test Stand.** Aerojet Rocketdyne signed a Space Act Agreement with NASA last year to test the preburner and main injector for its new AR1 rocket engine at Stennis. The company is scheduled to conduct a series of subscale tests on Cell 2 of the E-1 stand later this spring. Full-scale testing of the AR1 components is planned during the summer on Cell 1 of the E-1 stand. The AR1 is being developed as an American booster engine that could help end the U.S. dependence on foreign engines to launch payloads into space.
- **Advanced Booster Engineering Demonstration and Risk Reduction (ABEDRR) testing on E-1 Test Stand.** The ABEDRR effort is a joint project between NASA and the U.S. Air Force to develop a 500K thrust hydrocarbon engine both could use. Since the propellant requirements for the engine is similar to the AR1, testing for the project will follow the AR1 series on Cell 1 of the E-1 stand early this fall.
- **Novel Plume testing on the E-3 Test Stand.** The novel plume project is an in-house effort by NASA researchers and engineers to manipulate engine plume in a way that reduces erosion of the flame bucket. It has involved technology transfer resources and funding from various agency sources. Testing for the effort is scheduled to continue on the E-3 stand this spring.



NASA engineers conduct a novel plume test on the E-3 Test Stand at Stennis Space Center.

involved technology transfer resources and funding from various agency sources. Testing for the effort is scheduled to continue on the E-3 stand this spring.

It all adds up to a full year of testing, with more to come in fiscal year 2017. For instance, there is the possibility of full-scale AR1 engine tests on the A-2 Test Stand and of additional SLS testing related to the vehicle's upper stage. After completing successful test series in 2014 and 2015 on components for the new Raptor rocket engine being developed by SpaceX, there also is hope for additional test agreements with the company.

"This is a great time to be at Stennis," Benton said. "There is so much happening on so many fronts. We are really supporting and enabling a lot of key space initiatives, and I don't see that changing as we move ahead."

## FULFILLING NASA'S EXPLORATION MISSION

# Bolden – ‘The state of NASA is strong’



(Top photo) Stennis Space Center employees watch a live broadcast of NASA Administrator Charles Bolden as he provides a State of NASA update Feb. 9. During his comments, broadcast from Langley Space Center in Virginia, Bolden pronounced the state of NASA as “strong.” He said the \$19 billion of funding in President’s Obama’s proposed fiscal year 2017 budget would enable NASA to continue the progress on the agency’s Journey to Mars and enable new initiatives as well. Bolden cited various NASA efforts in such areas as aviation, Earth science, study of the cosmos and exploration of the solar system. He also noted the continued habitation of the International Space Station and its research value, as well as NASA’s ongoing work to partner with commercial companies to send cargo and humans into low-Earth orbit.

(Right photo) Stennis Space Center Director Rick Gilbrech speaks to site employees following the State of NASA broadcast. Gilbrech updated employees on areas of work under way at the center, including rocket engine testing to support the new Space Launch System vehicle.



## NASA in the News

### NASA Webb telescope mirror fully assembled

The 18th and final primary mirror segment is installed on what will be the biggest and most powerful space telescope ever launched. The final mirror installation Feb. 3 at NASA’s Goddard Space Flight Center in Greenbelt, Maryland marks an important milestone in the assembly of the agency’s James Webb Space Telescope. “Scientists and engineers have been working tirelessly to install these incredible, nearly perfect mirrors that will focus light from previously hidden realms of planetary atmospheres, star forming regions and the very beginnings of the Universe,” said John Grunsfeld, associate administrator for NASA’s Science Mission Directorate in Washington. “With the mirrors finally complete, we are one step closer to the audacious observations that will unravel the mysteries of the universe.” The Webb Telescope is the scientific successor to NASA’s Hubble Space Telescope. It will be the most powerful space telescope ever built and will study many phases in the history of the universe, including the formation of solar systems capable of supporting life on planets similar to Earth. It is targeted to launch in 2018. To watch the Webb telescope being built, visit: <http://www.jwst.nasa.gov/webcam.html>

### SLS mission to carry sci-tech satellites

The first flight of NASA’s new rocket, the Space Launch System (SLS), will carry 13 CubeSats to test innovative ideas, along with an uncrewed Orion spacecraft in 2018. These small satellite secondary payloads will carry science and technology investigations to help pave the way for future human exploration in deep space, including the journey to Mars. SLS’ first flight, referred to as Exploration Mission-1, provides the rare opportunity for these small experiments to reach deep space destinations, as most launch opportunities for CubeSats are limited to low-Earth orbit. “The SLS is providing an incredible opportunity to conduct science missions and test key technologies beyond low-Earth orbit,” said Bill Hill, deputy associate administrator for Exploration Systems Development at NASA Headquarters in Washington. “This rocket has the unprecedented power to send Orion to deep space plus room to carry 13 small satellites – payloads that will advance our knowledge about deep space with minimal cost.” For more information about the satellites scheduled to fly on EM-1, visit: <http://www.nasa.gov/launching-science-and-technology.html>.

### Data reveals record warm temperatures for globe

The Orion crew module pressure vessel has arrived at Kennedy Space Center in Florida and is now secured in an upgraded version of a test stand called the “birdcage” inside the Neil Armstrong Operations and Checkout Building. Orion will eventually take NASA on a journey to Mars, but first, the spacecraft is being prepared for a mission past the moon during Exploration Mission-1 (EM-1). The pressure vessel is the crew module’s underlying structure. Processing at Kennedy began Feb. 3 to prepare it for launch atop the agency’s Space Launch System rocket in 2018. “The arrival of Orion is very exciting for us,” said Scott Wilson, NASA Orion production manager. “This is the first mission where the Orion spacecraft will be integrated with the large Space Launch System rocket. Orion is the vehicle that’s going to take astronauts to deep space.” The vessel arrived Feb. 1 aboard NASA’s Super Guppy aircraft from the Michoud Assembly Facility in New Orleans, where its seven large segments were welded together. At Kennedy, the vessel will be outfitted with additional components and then tested to ensure it is structurally sound. For more on the Journey to Mars, visit: <http://www.nasa.gov/journeymars>.

Access all NASA news releases online at: <http://go.usa.gov/3f3KW>.

# 1976 – Naval Oceanographic Program arrives

*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.*

Besides the usual space shuttle main engine testing in 1976, organizational changes and arrival of the Navy's Oceanographic Center were a few highlights 15 years after the creation of Stennis Space Center.

The year began with the management of NASA's then-National Space Technology Laboratories' (NSTL) announcement of plans to consolidate the Applications Engineering group's activities with the Earth Resources Laboratory (ERL). NASA's remote sensing, environmental and related technology programs had been the primary responsibility of ERL, established in October 1970 and located at NSTL.

The purpose of the change was to consolidate similar activities for better coordination and increased support to applications development. ERL relocated to the Slidell Computer Complex in Louisiana with the organizational focus for NASA applications activity in the area. Some projects continued to be located at NSTL under ERL management.

On May 28, 1976, the Naval Oceanographic Program celebrated its official move to NSTL. NASA Associate Administrator Herbert Rowe told the crowd of the Navy's and NASA's relationship during the flag-raising ceremony. As he welcomed the newest neighbor to the NSTL community, Rowe said, "I feel that I also speak for the other federal agencies who share these facilities – the Department of Commerce, the Department of Interior, the Department of Transportation, the Environmental Protection Agency and the U.S. Army.

"During its young life, NASA has enjoyed a long and rewarding association with the U.S. Navy, dating back to the early days of Project Vanguard, America's first purely scientific satellite program. Vanguard was a landmark pro-

gram and progenitor of all American space exploration today," he said. "No less than 19 U.S. naval officers have distinguished themselves and the Navy as astronauts in NASA's manned space flight programs. And when these and other astronauts were splashing down in the oceans around the world, the U.S. Navy was there to assure their safe return to shore.

"NASA is proud of the work that has been done and is being done here by its NSTL team. We couldn't have built our bridge to the moon – the Apollo program – without this center's capability of testing the S-IC and S-II stages of the Saturn V vehicle. Through work being done here on the space shuttle's main propulsion system, we have to extend that bridge to the further reaches of our universe.

"The space technology that is being developed here in Hancock County, Mississippi, by NASA and other federal, state and private agencies, is the latest tool to serve in man's understanding of his place in the universe," Rowe continued. "It will serve to provide material benefits beyond anything generally imagined only a

few years ago in the fields of communications, navigation, weather forecasting, agriculture, forestry and the preservation of other Earth resources. The list is almost endless.

"And so, Mr. Secretary, as spokesman for the host agency of this multiagency operation, where the sharing and interchange of common facilities and services can further advance human development, it gives me great pleasure to say: 'Welcome aboard.'

"And now, I would like to introduce a gentleman who has been deeply involved in the Navy's relocation of its Oceanographic Center here, a distinguished member of the Rules Committee of the House of Representatives from Mississippi's Fifth Congressional District, the Honorable Trent Lott."

The upcoming 40th anniversary of the Naval Oceanographic Office at Stennis will be commemorated this year on May 28.



Navy "side boys" salute U.S. Senator John C. Stennis as an official welcome during the Navy flag-raising ceremony at NSTL on May 28, 1976.

## Office of Diversity and Equal Opportunity

# Every one learns more when they learn together

Most everyone has experienced the benefit of learning from others since early childhood when they mimicked their older siblings or made those first friendships beyond their home. Whatever the case may be, we learn quicker by interacting with others. That is where we started sharpening our skills even from those early years.

We rarely grow alone. In fact, some psychologists have made a compelling case that we only grow in connection with others. However, we do not need to learn with others in formal training or development programs: we can create our own opportunities to gain insight, knowledge and skills that move us on an upward trajectory. We can have more control over our learning at work if we make building high-quality connections a priority.

What are high-quality connections? They are the connections with other people in which we feel positive regard, mutuality and vitality. Positive regard is the sense that someone sees the best in us, even if we are only connected for a short time. Mutuality means we feel a sense of responsiveness and openness from another person. Finally, vitality captures the heightened sense of energy we feel when deeply connected to someone else, as if we are more alive in the moment.

These moments of aliveness in connection with others create a sense of safety and enhanced capability that become a powerful platform for development. We grow in high-quality connections because our thinking is broadened; we absorb knowledge more quickly; our action repertoire is expanded; and we are more engaged, playful, open and resilient in the face of setbacks. High-quality connections stand in stark contrast to low-quality connections, in which feelings of inadequacy, defensiveness and lack of safety undercut growth possibilities.

Research shows that there are at least seven different ways we can grow and improve through high-quality connecting. Keep in mind these tactics will not work with lower-quality relationships.

1. Create a lunchtime or after-hours working group with people from around your organization to watch educational talks or take an online course together.
2. Set learning goals for a specified time period, and invite one or two people to be your coaching partners to hold you accountable and cheer you on.
3. Look for a challenge in your organization and create a task force or working group to tackle it, with the explicit goal of creating high-quality connections that will lead to learning and growth for all.
4. Take on a shared experience with colleagues who are high-quality connections to explore and understand how work gets done with “fresh eyes.”
5. Reenergize a group or task force you are currently part of by actively increasing the quality of connections. Encourage members to seek and provide help to each other.
6. For employees who work remotely or have limited face-to-face contact, make an explicit effort to share stories in person about challenges and opportunities involved in doing the work. Numerous studies show that sharing stories is critical for facilitating the development of tacit knowledge, for making sure questions are asked safely and frequently and for providing the opportunity for people doing similar work to share and strengthen their expertise.
7. Stretch the boundaries of your work community beyond a common employer to find new sources of learning and support.

You can amplify opportunities for growth and learning by cultivating high-quality connections. Look for them inside and outside your team at work and beyond the boundaries of your organization or even outside your professional life. The great thing about investing in building and maintaining these connections is that everyone wins.

*(Adapted from an article published in the Harvard Business Review)*

## Hail & Farewell

### NASA bids farewell to the following:

Janet Haselmaier

Management Support Assistant

Engineering & Test Directorate

### And welcomes the following:

Joseph Marucci

Contract Specialist

Office of Procurement

Michael Pannell

Industrial Hygienist

Center Operations Directorate

## Recent Stennis events celebrate Black history



(Left photo) Rev. Alice Graham speaks during a Martin Luther King Jr. Day program Jan. 19. Graham serves as executive Director of Back Bay Mission in Biloxi, which serves the poor and marginalized of the Gulf Coast by providing emergency assistance, intensive case management, and peer support networks. (Right photo) Director Rick Gilbrech (l) and Stennis Safety and Mission Assurance Directorate Director Freddie Doublas (r)



present a commemorative plaque to Morgan Watson following his Black History Month presentation Feb. 17. Watson founded Minority Engineers of Louisiana Inc. and now serves as part-time associate professor of mechanical engineering at Southern University. He was honored at the Smithsonian National Air and Space Museum in 2010 as a pioneer for being one of the first African American engineers employed by NASA.



### Stennis observes annual Day of Remembrance

Stennis Space Center Deputy Director Randy Galloway speaks to site employees during the annual Day of Remembrance ceremony Jan. 28. Following his comments, Galloway and Associate Director Ken Human placed a memorial wreath in memory of NASA family members who lost their lives while furthering the cause of exploration and discovery, including the crews of Apollo 1 and shuttles Challenger and Columbia. The NASA Day of Remembrance is observed each year in January. This year's ceremony was held on the 30th anniversary of the space shuttle Challenger tragedy, which occurred during launch on Jan. 28, 1986.

### Stennis Space Center Smoking Policy Reminder

Smoking tobacco products AND the use of electronic cigarettes at Stennis is prohibited as follows:

- (1) Inside ALL interior spaces owned, rented, or leased by NASA Stennis Space Center.
- (2) In courtyards and in any outdoor areas within 25 feet of doorways and air intake ducts.
- (3) In any location identified as a no-smoking area (e.g., liquid hydrogen storage tanks, fuel storage and transfer areas, etc.).
- (4) In Stennis Space Center-leased GSA vehicles.

For additional information, please refer to SPD 1800.1 or call Katrina Wright at (228) 688-3263.