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LAGNIAPPE

John C. Stennis Space Center

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Getting set

See page 4

There I was, playing golf last weekend, trying to avoid the briars as I looked for my ball in the overgrowth. Yes, I had hit my shot offline – again. The way I figure it, though – my golf game is teaching me how to deal with adversity in life. Ark!

Thus far, one could say the same things about the last several months, especially when it comes to the [Space Launch System](#) (SLS) core stage Green Run test series at Stennis. Talk about adversity! Just as the series of eight tests gets started early in the year, a pandemic arrives that forces an end to activities for several weeks. Then, when the series does get back underway, test team members have to practice new safety and health protocols to prevent spread of the COVID-19 virus.

As if a pandemic is not enough, hurricane season soon arrives with recordbreaking force in the midst of resumed activities. By last count, the Atlantic season has seen 26 tropical or subtropical cyclones, 25 named storms, nine hurricanes, and two major hurricanes. And we are still counting!

Each approaching storm forces test teams to curtail activities to secure the stand and core stage. While none

of the storms have been damaging to the Stennis area, they do play havoc with the [Green Run](#) schedule.

Yet – Stennis and the integrated test team has persevered, which is no surprise. Stennis folk always have exhibited a “can-do” attitude. From the days of Saturn V tests and Moon missions, through 135 space shuttle missions, all the way up to the SLS Green Run test series, Stennis has responded to every call and challenge.

In February, I suggested the Green Run series would prove to be one of the center’s “finest hours” – and that was before all of the extra challenges were thrown at the test team. With the final hot fire test just ahead, no one can doubt that this chapter of Stennis history will stand front-and-center as an example not just of the site’s “can-do” attitude but of its “and-will-do-regardless-of-obstacles” determination.

Now, excuse me as I try to hit this golf shot. I just need to go between seven trees, over a pond that looks as wide of the Pacific Ocean and miss what surely seems like 17 sand traps to reach the green. However, as Gerald Ford once said, “I know I’m getting better at golf because I’m hitting fewer people.” Fore!



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NASA's MOON to MARS MISSION

Space Launch System Green Run Test Series

Teams complete countdown exercise



Ryan McKibben, Green Run test conductor at NASA's Stennis Space Center, monitors progress of a simulated countdown exercise completed Oct. 5, the sixth test of the eight-part core stage Green Run test series for NASA's Space Launch System (SLS) rocket. The SLS core stage being tested is the largest rocket stage NASA has ever produced and will be the stage that helps deliver the Artemis I mission to space. The 212-foot-tall core stage has two huge propellant tanks that collectively hold more than 733,000 gallons of propellant to fuel four RS-25 engines at the bottom of the stage. The rocket stage also has three flight computers and avionics systems to help launch and guide NASA's Artemis missions to the Moon. During the simulated countdown, NASA engineers and technicians, along with prime contractors Boeing and Aerojet Rocketdyne, monitored the stage to validate the timeline and sequence of events leading up to the test, which is similar to the countdown for the Artemis I launch. The countdown sequence for an actual Artemis launch begins roughly two days prior to liftoff. In addition to all the procedures leading up to the ignition of the four RS-25 engines, the SLS core stage requires about six hours to fully load fuel into the two liquid propellant tanks. The simulated countdown sequence test at Stennis began at the 48-hour mark as if the stage was first

powered up before liftoff. Engineers then skipped ahead in the countdown sequence to monitor the stage and procedures of the stage 10 minutes before the hot fire. The simulated countdown sequence is one of the final tests of the SLS Green Run campaign. In upcoming weeks, engineers will conduct a "wet dress rehearsal" that involves actually loading the liquid hydrogen and liquid oxygen propellants in the stage. Following completion of that exercise, the Green Run series then will culminate with the eighth and final test – a hot fire of the stage's four RS-25 engines. The hot fire will generate a total of 1.6 million pounds of sea-level thrust, just as during an actual launch. The Green Run series of tests is designed to gradually bring the SLS rocket stage and all its systems to life for the first time. The Green Run test campaign also will validate the SLS core stage design and ensure it is ready for the first and future Artemis missions beyond Earth's orbit to the Moon through the agency's Artemis program. NASA is working to land the first woman and the next man on the Moon by 2024. SLS and Orion, along with the human landing system and the Gateway in orbit around the Moon, are NASA's backbone for deep space exploration. SLS is the only rocket that can send Orion, astronauts, and supplies to the Moon in a single mission.

NASA's MOON to MARS MISSION

A-1 Test Stand getting set for new test series of Space Launch System engines

It is no exaggeration to call the [A-1 Test Stand](#) at Stennis Space Center an engineering marvel. Built in the 1960s, it remains efficiently functional almost 60 years later.

That is no small feat for a stand first used to test the Saturn V stages that helped power the Moon missions of the [Apollo Program](#). Following that program, more than 1,000 space shuttle main engines tests were conducted on the stand. NASA also tested X-33 and J-2X engines on the stand.

Maintaining the stand in operational condition demands constant attention, which is why the A-1 team welcomed the chance to focus on facility needs for the past 19 months. Following completion of an [RS-25 engine](#) test series in April 2019, they had time to work on needed projects before a new series of tests of the engines that will help power NASA's new [Space Launch System](#) (SLS) rocket begins.

Subsequent projects touched all major areas, including facility construction, mechanical operations, and electrical operations. These included work to:

- Replace FireX spray rings on the run tanks.
- Replace drain piping on the flame deflector
- Replace some flame deflector mini manifolds used to spray water during a test.
- Remodel the Test Control Center.
- Upgrade facility cameras.
- Upgrade the data acquisition system.
- Upgrade facility control systems.
- Upgrade video control systems.
- Replace the Pressure Reducing Area trench.

Two noteworthy efforts focused on the large liquid hydrogen and liquid oxygen run tanks and installation of a new thrust vector control system.

"There were a lot of challenges with getting much of this work done, particularly the run tanks," noted Chip Ellis, RS-25 project manager at Stennis. "Each project had unique aspects, but each also was important to ensuring the stand could function at a high level into the future."

Servicing the run tanks required a considerable effort. "The run tanks were in great need of re-coating," said Casey Wheeler, the NASA engineer who headed that project. "The existing coating

system had reached its expected service life, and continual deterioration would have resulted in adverse risk to the A-1 Test Stand and the RS-25 test program."

In addition to sandblasting and recoating the tanks, team members installed new stainless steel FireX spray rings to ensure adequate fire protection was in place. They also identified and repaired weakened areas of the tank walls.

Blasting the tanks required a large amount of scaffolding to be erected. The tanks also had to be contained and sealed to ensure no hazardous materials escaped. Weather posed a problem, as did the COVID-19 pandemic that erupted earlier this year. Nevertheless, team members from NASA, Bastion, Healthcon and Syncom Space Services persevered to complete the work.

On another front, team members used the past months to finalize and install a new thrust vector (TVC) control system needed to gimbal test RS-25 engines. TVC systems are used to move rocket engines as needed in order to direct thrust and control a rocket's trajectory. Essentially, gimbaling the engines helps steer the rocket on the proper course.

Stennis never has had a NASA-designed-and-built gimbal system. Previously, when engines had to be gimballed, systems were provided by others. A couple of years ago, NASA engineers set out to remedy the issue.

The result is the first homegrown TVC system for the south Mississippi facility. It builds on previous systems using new technology, particularly a digital controller rather than an older analog one. "We now have a new system that is completely separate from the test article but allows us to take the test article through whatever test parameters are needed," said David Carver, NASA electrical test operations lead and subject matter expert who led the design and development of the Stennis TVC system.

The new system is designed specifically to test RS-25 engines, a critical need in development of SLS, which is being built to carry humans back to the Moon through the [Artemis program](#) and, eventually, on to Mars. "We absolutely need to gimbal test the RS-25 because there are new,



A recent photo shows the recoated and newly serviced liquid hydrogen and liquid oxygen run tanks on the A-1 Test Stand at Stennis. The project was one of several to prepare the historic Stennis stand for a new series of RS-25 engine tests.

lighter-weight materials on the engines," Carver noted. "We have to make sure those are able to withstand the conditions they will be subjected to during an actual flight."

The TVC project, headed by NASA Project Manager Tommy Carroll, has involved a lot of facets, including developing the software needed for its operations. "Others have TVC systems, but this is the first one NASA Stennis has designed and developed for ground testing," Carroll said. "So, while this is not a case of breaking new ground, it certainly is an instance of providing new capabilities for Stennis. We're using modern technologies to do something we've never done before."

The new system has been tested with an 8,000-pound mass simulator (that approximates the size and weight of an RS-25 engine) but has not been demonstrated during a hot fire test. When RS-25 testing resumes later this year, operators will devote one of the hot fire tests to running the Stennis TVC system through a series of steps to ensure it is working properly.

Stennis already has used the A-1 Test Stand to test the RS-25 engines needed for the first four SLS missions, including the Artemis program flight that will carry the first woman and next man back to the Moon. These initial engines are modified space shuttle main engines, equipped

with some new components and a new controller or "brain."

When testing resumes, the A-1 stand will be used to conduct additional developmental testing as Aerojet Rocketdyne works to build brand new RS-25 engines. Stennis also will test new RS-25 flight engines for future SLS missions.

"Once again, Stennis is proving its value and importance as the nation's largest rocket propulsion test site and a critical step in the path to the Moon and Mars," Ellis said. "The abilities of the Stennis test teams to prepare facilities and conduct critical test series are second to none."

Report: NASA significantly benefits U.S. economy

NASA released the results of its first-ever agencywide economic impact report Sept. 25. The report shows that, through all NASA activities, the agency generated more than \$64.3 billion in total economic output during fiscal year 2019, supported more than 312,000 jobs nationwide, and generated an estimated \$7 billion in federal, state, and local taxes throughout the United States.

“In this new era of human spaceflight, NASA is contributing to economies locally and nationally, fueling growth in industries that will define the future, and supporting tens of thousands of new jobs in America,” said NASA Administrator Jim Bridenstine.

“With an investment of just one-half of 1 percent of the federal budget, NASA generates significant total economic output annually. This study confirms, and puts numbers, to what we have long understood – that taxpayer investment in America’s space program yields tremendous returns that strengthen our nation on several fronts – a stronger economy, advances in science and technology, and improvements to humanity.”

The agency commissioned an economic impact study to better understand how the U.S. economy benefited in fiscal year 2019 from America’s lunar and Mars exploration efforts. The study found the agency’s [Moon to Mars](#) exploration approach generated more than \$14 billion in total economic output and supported more than 69,000 jobs nationwide in fiscal year 2019.

Additional key findings of the study include:

- Every state in the country benefits economically through NASA activities. Forty-three states have an economic impact of more than \$10 million. Of those 43 states, eight have an economic impact of \$1 billion or more.
- The agency’s Moon to Mars initiative, which includes the [Artemis program](#), supports more than 69,000 jobs, \$14 billion in economic output, and \$1.5 billion in tax revenue. The agency’s Moon to

Mars programs provided about 22 percent of NASA’s economic impact. These figures are expected to double in 2021.

- NASA has more than 700 active international agreements for various scientific research and technology development activities in FY2019. The [International Space Station](#) is a significant representative of international partnerships – representing 15 nations and five space agencies and has been operating for 20 years.
- [NASA spinoff technologies](#) provide an impact on American lives beyond dollars and jobs. The agency has recorded more than

2,000 spinoffs since 1976. For example, engineers at NASA’s Jet Propulsion Laboratory developed, in just 37 days, a ventilator specifically for coronavirus patients and, after securing an emergency use authorization from the Food and Drug Administration, made the design available to select manufacturers at no cost.

- Scientific research and development –

which fuels advancements in science and technology that can help improve daily life on Earth and for humanity – enjoys the largest single-sector impact, accounting for 16 percent of the overall economic impact of NASA’s Moon to Mars program.

The study was conducted by the Nathalie P. Voorhees Center for Neighborhood and Community Improvement at the University of Illinois at Chicago (UIC). UIC has worked with NASA’s Marshall Space Flight Center on economic impact reports conducted for the center, and the Voorhees Center is widely recognized as one of the foremost organizations conducting economic impact studies for corporations, communities, and government agencies.

A summary of the study is available [here](#).

The full study available [here](#).



NASA’s impact is comprehensive – and life-changing

Note: The following is an op-ed by Dr. Rick Gilbrech, director of NASA’s Stennis Space Center near Bay St. Louis, Mississippi, written in response to release of the NASA Economic Impact Report – FY19.

NASA had a problem in 1961. The agency had selected a large area in Hancock County, Mississippi, to build its propulsion test site. Unfortunately, building the much-needed site would require relocating more than 600 families, some of which were not happy with the news.

On Nov. 1, 1961, NASA and other leaders gathered in one of the local Hancock County communities to meet with residents. The gathering proved pivotal as the leaders called on residents to trust that all was for the best and would work out well.

That meeting proved to be the cornerstone for an enduring and invaluable partnership between NASA’s [Stennis Space Center](#), now the nation’s largest rocket propulsion test site, and its surrounding communities. Stennis and its related communities have grown and worked together for almost six decades, each supporting and benefiting from the other in a multitude of ways.

I thought of that history and partnership recently when NASA released its newly-commissioned [Economic Impact Report 2019](#). The report is a highly credible look at the space agency and what it means to the nation. It was compiled by the Nathalie P. Voorhees Center for Neighborhood and Community Improvement at the University of Illinois at Chicago, widely recognized as one of the foremost organizations conducting economic impact studies for corporations, communities, and government agencies.

The economic impact of NASA outlined in the report can only be described as “comprehensive.”

According to the detailed look, all 50 American states and the District of Columbia see economic benefits from NASA and its research, development, and space exploration work. Overall, the agency generated a total economic output of more than \$64 billion in the 2019 fiscal year, supported more than

312,000 jobs and totaled almost \$7 billion in federal, state, and local tax revenues.

That is not all.

The agency is committed to transferring its developed technologies, products, and processes to private companies and everyday life. In the 2019 year, that meant generating 1,839 new technology reports, filing 85 new patent applications, receiving 122 patents and entering into 2,692 software usage agreements.

You see why I chose the word “comprehensive.”

Mississippi benefits greatly from NASA-related work. As the study indicates, NASA and its various missions, including the [Moon to Mars](#) initiative now underway, generated the following for the Magnolia state:

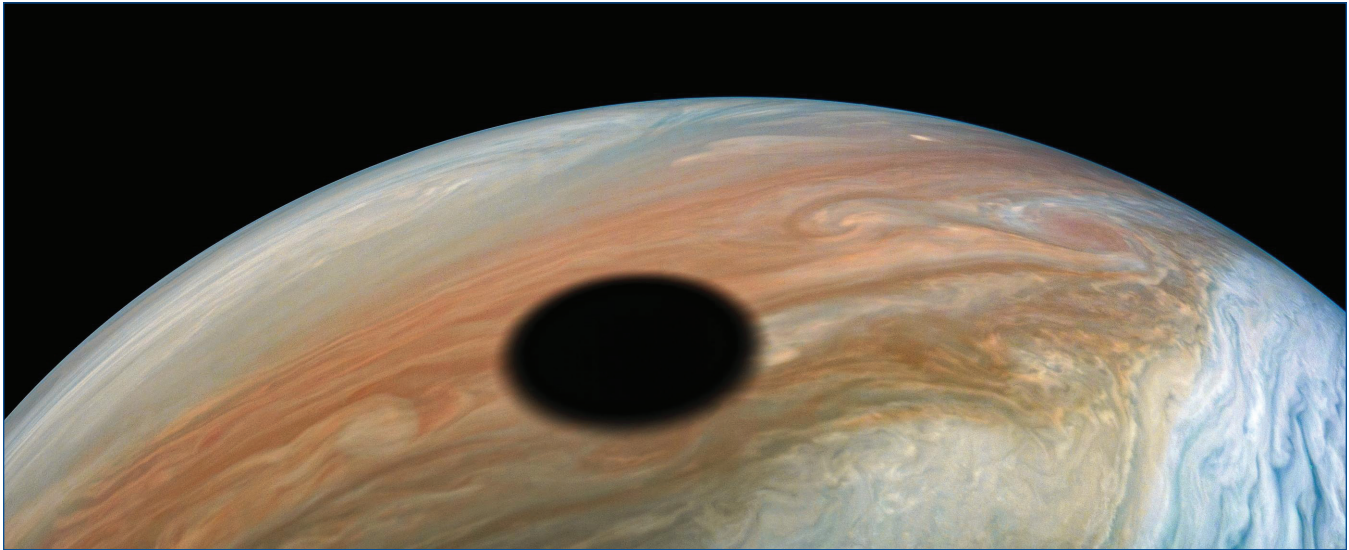
- 3,633 jobs (11th among states).
- An economic output of \$570.5 million (11th among states).
- 493 jobs directly related to NASA’s Moon to Mars efforts (9th among states).
- A Moon to Mars economic output of just more than \$77 million (11th among states).

Mississippi truly stands on the front lines of NASA’s missions, especially as Stennis tests the engines and propulsion systems for the agency’s new [Space Launch System](#) rocket that will power those Moon to Mars missions of tomorrow.

For the state – and the entire nation – the economic impact is real, not to mention the importance of the agency’s scientific and technological advances and everyday improvements to life. The entire NASA agency receives less than half of 1 percent of the annual U.S. budget but uses this small taxpayer investment to produce tremendous returns.

Yes, NASA has kept its word – in Mississippi and across the nation. It has carried the entire country to the Moon and to the reaches of our solar system. It has improved daily life in countless areas and ways. It has provided groundbreaking advances in science and related fields. It has inspired entire generations to learn, dream, and reach.





Juno captures moon shadow over Jupiter

Jupiter's volcanically active moon Io casts its shadow on the planet in this dramatic image from NASA's Juno spacecraft. As with solar eclipses on the Earth, within the dark circle racing across Jupiter's cloud tops one would witness a full solar eclipse as Io passes in front of the Sun. Such events occur frequently on Jupiter because it is a large planet with many moons. In addition, unlike most other planets in the solar system, Jupiter's axis is not highly tilted relative to its orbit, so the Sun never strays far from Jupiter's equatorial plane (just plus or minus 3 degrees). This means Jupiter's moons regularly cast their shadows on the planet throughout its year. Juno's close proximity to Jupiter provides an exceptional fish-eye view of this solar eclipse, showing a small fraction near the planet's equator. The

shadow is about 2,200 miles wide, approximately the same width as Io, but appears much larger relative to Jupiter. A little larger than Earth's Moon, Io is perhaps most famous for its many active volcanoes, often caught lofting fountains of ejecta well above its thin atmosphere. Citizen scientist Kevin M. Gill created this enhanced-color image using data from the spacecraft's JunoCam imager. The raw image was taken on Sept. 11, 2019, as the Juno spacecraft performed its 22nd close flyby of Jupiter. At the time the image was taken, the Juno spacecraft was about 4,885 miles from the cloud tops of Jupiter at a latitude of 21 degrees. JunoCam's raw images are available online for the public to peruse and to process into image products at: <https://missionjuno.swri.edu/junocam/processing>.

NASA in the News

Webb completes environmental testing

With the completion of its latest series of milestone tests, NASA's [James Webb Space Telescope](#) has now survived all of the harsh conditions associated with a rocket launch to space. Webb's recent tests have validated that the fully assembled observatory will endure the deafening noise, and the jarring shakes, rattles and vibrations that the observatory will experience during liftoff. Known as "acoustic" and "sine-vibration" testing, NASA has worked carefully with its international partners to match Webb's testing environment precisely to what Webb will experience both on launch day, and when operating in orbit. Though each component of the telescope has been rigorously tested during development, demonstrating that the assembled flight hardware is able to safely pass through a simulated launch environment is a significant achievement for the mission. Completed in two separate facilities within Northrop Grumman's Space Park in Redondo Beach, California, these tests represent Webb's final two, in a long series of environmental tests before Webb is shipped to French Guiana for launch. For more about Webb, visit [here](#). For more video resources, visit [here](#).

NASA, SpaceX to launch mission Oct. 31

NASA and SpaceX are beginning a regular cadence of missions with astronauts launching on an American rocket from American soil to the International Space Station as part of NASA's Commercial Crew Program. NASA's SpaceX Crew-1 is the first crew rotation mission with four astronauts flying on a commercial spacecraft, and the first including an international partner. NASA astronauts Michael Hopkins, Victor Glover, Shannon Walker, and Soichi Noguchi of the Japan Aerospace Exploration Agency (JAXA) are set to launch to the space station on SpaceX's Crew Dragon spacecraft and Falcon 9 rocket. The Crew-1 astronauts named the spacecraft Resilience, highlighting the dedication the teams involved with the mission have displayed and to demonstrate that when we work together, there is no limit to what we can achieve. They named it in honor of their families, colleagues, and fellow citizens. Launch is targeted for Oct. 31 from Launch Complex 39A at NASA's Kennedy Space Center in Florida. The crew is scheduled for a long duration stay aboard the orbiting laboratory, conducting science and maintenance. The four astronauts are set to return in spring 2021.

NASA engineers enjoys perfect career at Stennis

At age 6, Greg Carmouche watched the launch of Apollo 11 from a friend's house in Harahan, Louisiana, not far from St. Rose, Louisiana, where he grew up. It was a special occasion, as the friends had a color television to view the historic beginning of the first mission that carried humans to the Moon.

Carmouche still remembers the “smoke” he saw coming out of the sides of the Saturn V rocket. He did not yet know the “smoke” was actually venting of the cryogenic tanks that carried the rocket's liquid propellants. “When that thing lifted off, all the folks in the room jumped up and cheered,” Carmouche said. “I remember it being something very profound even though I didn't fully understand what it took to get us there.”

He understands now, though, thanks to his work as an engineer at [Stennis Space Center](#). Now a Covington, Louisiana, resident, Carmouche has spent 30 years at Stennis, the first 10 years as a systems and test operations engineer with Aerojet Rocketdyne and the last 20 as a test operations, and design and analysis engineer with NASA.



Greg Carmouche stands at the High Pressure Gas Facility at Stennis Space Center, where he has spent 30 years as an engineer, including the last 20 on the NASA team.

Carmouche now works as a senior test director, responsible for supporting other directors across the Stennis test complex and in the support facilities. He is closely involved with [Green Run](#) testing of the first flight stage of NASA's new [Space Launch System](#) (SLS) rocket on the B-2 Test Stand at Stennis. Carmouche is directly responsible for supporting the Cryogenic Storage Facility, High Pressure Gas Facility and High Pressure Water Facility, which provide critical Green Run services.

The work is challenging, especially when it comes to providing the volume of high pressure gases – helium, hydrogen, nitrogen, and air – needed to conduct the hot fire test of the SLS core stage, which culminates the Green Run series. Carmouche finds the work is fulfilling and exciting, especially when he thinks about that first Apollo launch, he viewed so many years ago.

“I consider it a privilege and a special opportunity to work

and be a part of helping us fly again to the Moon and also to be a part of the history of this great nation.”

Carmouche did not grow up with sights set on working at Stennis. College friends told the new graduate about the site and how he could submit an application to work there. Not long after he did so, Aerojet Rocketdyne contacted him. He joined the company in August 1990.

It was a perfect move for him. Even 30 years later, when asked what he likes best about working at Stennis, he responds, “Everything!” He particularly praises the diversity of the Stennis workplace and the chance to be a part of such important work.

“When you work for a place this long, folks here become friends and family,” he said. “It's a safe place to work and at the end of the day when we put ‘fire in the bucket’ and feel the roar of a successful engine test, well, you can't ask for much more than that.”

Carmouche has received numerous recognitions for his efforts through the years, including prestigious Space Flight Awareness

honors for individual excellence and contributions to operations. He now looks forward to seeing future SLS missions and Artemis program flights back to the Moon. “I believe flying again will give us the momentum to keep flying not only to the Moon but hopefully to Mars in my lifetime,” he said. “If that happens Stennis will become very, very busy.”

Looking back on his career, Carmouche is thankful for the friendship and support he has received from his Stennis and NASA family. That was particularly important last month, when his mother, a single parent and longtime Louisiana public school educator, passed away.

“She was the compass that guided me through life,” Carmouche said. “She was the one who took us to watch that Apollo 11 launch, and I hope it makes her proud to know that I'm a part of something much bigger than myself in supporting NASA going back to the Moon.”

Stennis contractor cited for life-saving action

When Brandon Cortese came across a trail of blood at his construction jobsite at the National Center for Critical Information Processing and Storage facility at Stennis Space Center on June 29, he suspected someone had experienced an accident.

Following the drops, Cortese came across Kevin Baker, the foreman for Drace Construction in Ocean Springs, Mississippi, lying on the ground, a rag covering a large wound on his arm.

Cortese, an apprentice electrician contractor for Doleac Electric in Gulfport, Mississippi, sprang into action.

Aware that he needed to stop the bleeding, Cortese called out to other workers for some clean rags and a stick or tool. With the fresh rags and a stick, he then applied a field tourniquet above the wound.

“As soon as I applied the tourniquet, I told Baker to hold on to the stick and don’t let it go,” Cortese said. “I was really concerned about the loss of blood.”

Cortese, who resides in North Picayune, Mississippi,

served in the U.S. Army as a combat engineer and received first aid training while in the military. At the time of the accident, he had been on the jobsite for only two days, awaiting his site access to work inside the information processing and storage facility. However, his quick

response, training, and calm demeanor saved Baker’s life.

“I really appreciate that man a bunch,” Baker said later. “God was behind every part of how perfect everything was set in place.”

For his actions, NASA Shared Services Center Executive Director Anita Harrell awarded Cortese the NASA



NASA Shared Services Center Executive Director Anita Harrell presents a NASA Exceptional Bravery Medal citation to Brandon Cortese, who helped save a coworker’s life following a June 29 accident.

Exceptional Bravery Medal during a Sept. 9 ceremony. NASA awards the Exceptional Bravery Medal to individuals for exemplary and courageous handling of an emergency. Cortese’s citation reads, “For immediate response and lifesaving aid that prevented the loss of human life.”

NASA Deputy Administrator Jim Morhard joined the onsite ceremony via Microsoft Teams. Doleac Electric and Drace Construction are both small business subcontractors supporting facility improvements at Stennis.

NASA wants to know – what is in your Moon kit?

Steps are being taken to land the first woman and the next man on the Moon, and NASA wants to know: what would you pack for a trip to the Moon?

Share your excitement about upcoming missions by thinking about what you would pack for the Moon! What can you not leave the planet without? Show NASA what is in your suitcase with the hashtag #NASAMoonKit!

Astronauts have tight constraints when it comes to their “personal preference kit.” Each is allowed a 5-inch-by-8-inch-2-inch volume traveling to the International Space

Station. Make your #NASAMoonKit fit into this tight space and show how you did it with a picture or video!

There are three social media platforms to submit work:

- Instagram (use Instagram to upload photo or video and include #NASAMoonKit in the description)
- Twitter (share image on Twitter and include #NASAMoonKit in the tweet)
- Facebook (share image on Facebook and include #NASAMoonKit in the post).

NASA may share posts on other agency accounts.

FAA sets new restrictions on Stennis drone operations

A new flight restriction has been announced that bars all unauthorized unmanned aircraft system (UAS) operation within Stennis airspace up to 400 feet. The new restriction applies to all of the Stennis fee area where site facilities are located.

Operation of UAS – or drone – aircraft has seen a tremendous rise in popularity, including in the vicinity of the center. However, unauthorized UAS activity poses a potential threat to the safety and security of the NASA propulsion test mission at Stennis, as well as the growing scope of agency missions of federal city partners.

With this in mind, NASA sought additional protections from the Federal Aviation Administration (FAA) on unauthorized drone activity in the Stennis airspace.

“I am pleased to announce that we have been notified that the FAA has placed a new flight restriction for UAS within the Stennis airspace up to 400 feet, commonly referred to as a NO DRONE ZONE,” Stennis Director Rick Gilbrech reported recently. “This flight restriction is a regulatory action to restrict certain aircraft from operating within a defined area to protect persons or property in the air or on the ground. “

The Title 14 Code of Federal Regulations (CFR) 99.7,

Special Security Instructions, restricts all UAS operations that are not approved for official business. Flying UAS systems at Stennis, drones as well as model and radio-controlled aircraft, without permission of NASA is considered a violation of the new restriction and may result in fines by the FAA, or other civil or criminal penalties.

The new restriction is in addition to the existing areas of Stennis Restricted Airspace (R4403) used for official aircraft operations and propulsion testing. When activated, all nonparticipating aircraft are denied entrance into the restricted area.

All UAS/drone operations at Stennis required for official business of NASA or its federal city partners must be coordinated and approved in advance with Stennis Range & Aviation Operations Manager Jason Peterson at 228-688-1257 or jason.e.peterson@nasa.gov or by submitting a request to the Stennis Range Request System at <https://airrange.ssc.nasa.gov/#/new>.

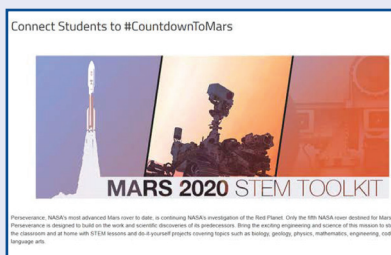
To further prevent unintentional airspace violations, the FAA has developed a smart phone application called B4UFLY. The app helps UAS operators determine if any restrictions or requirements are in effect in their areas before flying. For more information, please see FAA rules on UAS operation at www.Faa.gov/uas.

For the latest on NASA/Stennis Space Center status, please access:

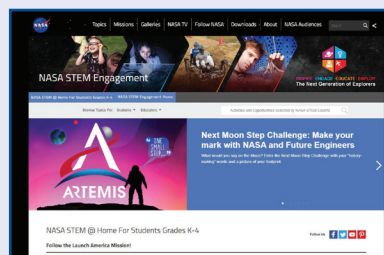
Stennis Emergency Management web page

NASA Coronavirus Response Information web page

Other online resources:



MARS 2020 STEM Toolkit



NASA STEM@Home for Students



NASA at Home

How to Draw Artemis

NASA E-Book Downloads

Stennis helps NASA achieve (very) lofty goals



Note: NASA's John C. Stennis Space Center has played a pivotal role in the nation's space program. The following offers a glimpse into the history of the space program and the rocket engine test center.

In 1966, Mississippi started what might have seemed impossible work to some, testing rockets to carry humans to the Moon. In 1969, the goal was achieved as the rockets safely delivered astronauts to the Moon.

In 1975, Mississippi used the knowledge and expertise from the Apollo era to begin testing the reusable, highly efficient space shuttle main engine. In 1981, three of those engines helped launch the reusable space shuttle Columbia on the first shuttle mission.

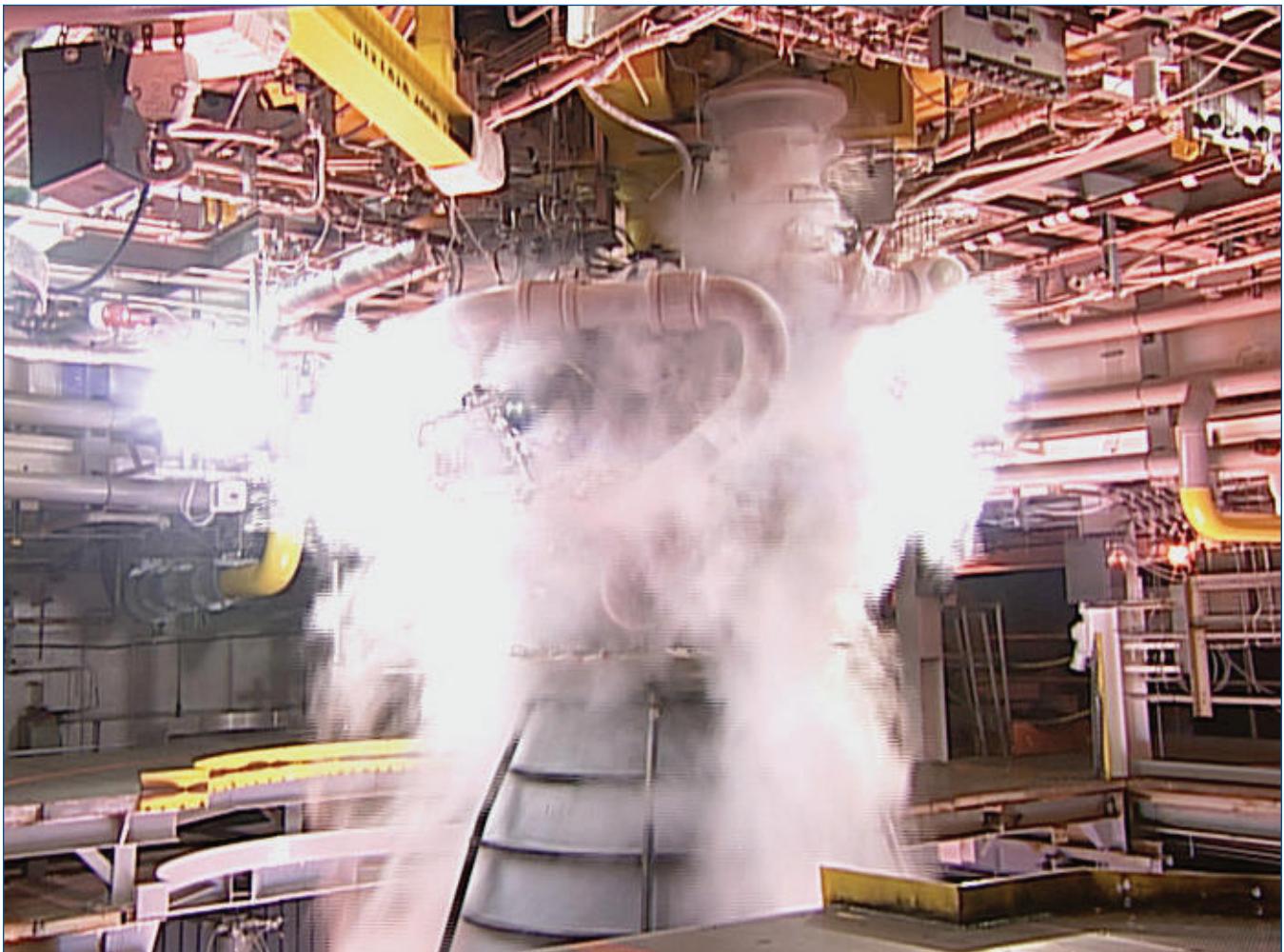
The 135 overall shuttle missions greatly expanded U.S. time in space. Shuttle missions allowed NASA to study the effects longterm space travel can have on people and equipment. They also supported construction of the International Space Station, as well as subsequent experi-

ments on board the orbiting platform about how humans can live and work in space. Shuttle missions also helped deploy and service the [Hubble Space Telescope](#).

In 2015, Mississippi once again fired up engines for a new rocket designed to accomplish something that surely once seemed impossible – establishing a sustainable presence on the Moon through [Artemis program](#) missions and enabling eventual missions to Mars. The new [Space Launch System](#) (SLS) rocket will enable missions that provide a better understanding of how to send humans into deep space.

Four [RS-25 engines](#) will help launch SLS on its missions to the Moon and elsewhere. The engines build on space shuttle main engine technology with some modifications. For instance, they operate at a higher pressure and with cooler propellants. The engines are the first exploration class engines since the Apollo era.

Once again, NASA has reached out to Stennis to test the RS-25 engines. The agency conducted the first RS-25 test on the A-1 Test Stand at Stennis on Jan. 9, 2015.



Mounted cameras on the A-1 Test Stand at Stennis Space Center offer a closeup view of NASA's first RS-25 engine test on Jan. 9, 2015.

Office of Diversity and Equal Opportunity

Ensure psychological safety while working remotely

P psychological safety describes a work environment in which team members feel open to share ideas, take risks, and express concerns without retribution.

Teams with high levels of psychological safety are willing to put forward bold ideas because they are not afraid of being shot down or made fun of. They are able to raise concerns and own up to mistakes to prevent those mistakes from becoming bigger problems down the line. Employees know that their opinions are heard, and that makes them feel valued and engaged with their work.

As most businesses move to remote work in these difficult times, it is more important than ever to foster psychological safety within teams to keep colleagues connected. These are a few tips to take the principles of psychological safety into the remote workspace.



Create new

communication channels

There are plenty of amazing tools for staying connected while working remotely, such as Teams. Customize the communication to allow ideas to be shared while not overwhelming teammates with distracting notifications.

Encourage remote workers to get to know one another

Getting to know more about your colleagues behind the screen is crucial. It not only lessens the feeling of isolation when working from home, it opens the team up to accept new ideas. Use video calls to connect where it is not disruptive, or simply make it a habit to ask a few non-work questions, such as: “What book have you been reading lately?” or “What inspired you this week?”

Create a recurring “stand-up”

Whether it is through written updates or video chats, a

recurring stand-up meeting gives everyone the chance to share what they are working on and where they need help. Do not make the mistake of just reporting the positives or you will only send the message that it is not okay to discuss mistakes. Encourage everyone to share one or two things they did well, and another where they messed up and need help.

Book in regular one-to-ones

Private one-to-one discussions are critical for motivating direct reports and building honest working relationships. When you go remote, these can sometimes take

a backseat, as you miss the informal coffee chats and face-to-face time in the office. Make sure to take the lead and book recurring one-to-ones to check in and discuss work performance.

Roll out

360 feedback

Feedback is easy to get when people are working side-by-side, but with

the physical distance of remote work, this becomes a lot harder. Setting a framework for giving constructive feedback will help everyone to stay connected. Make sure you are asking for your own feedback, as well as teaching teammates to give upward feedback and providing them with some examples of what good, constructive feedback looks like.

Measure psychological safety

Lastly, psychological safety is something you can benchmark within your team and measure for improvement. Asking a few simple questions, either directly or through a pulse survey, will help team members to gauge how safe your team feels and what you should work to improve.

This article includes information from: “Psychological Safety in the Remote Workplace” by Kylie Strickland, online at: peoplegoal.com/blog/psychological-safety.