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NASA 'fires up' RS-25 flight engine

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*“Celebrating anniversaries
reminds us of what we yet can do –
if we set our minds and energies to it.”*



Whoa! Did you see the test of the first RS-25 flight engine on March 10? What a great day – and NASA is on its way to Mars! What could be better? If you had looked close, you would have seen me at the test, 'cause I was there.

I would not have missed the hot fire for the world. I was at the first test here in 1966, and we're just a matter of days from that 50th anniversary. You better believe Stennis is going to be celebrating that day.

Why not? The test back on April 23, 1966, meant more than you almost can describe. A lot of people talk about how it brought south Mississippi into the Space Age – and that's true enough. It also set this whole country firmly on its way to the moon.

At the time, the United States was playing catch-up with the Soviet Union in space. Soviets were the first to launch a satellite, to send humans into space, to walk in space. They even had landed a probe on the moon! The U.S. had its own missions, but there were problems. Just a month before that first test, the Gemini 8 mission had launched and lasted only 10 hours before a faulty thruster forced it back to Earth.

Let's just say, the American space program needed a shot in the arm, and it got it right here at Stennis Space Center on an April morning 50 years ago.

The test was not easy; people worked all day and all night to deal with issues. It took about 25 hours to count down to the test, but they did it! And just

43 tests and about 1,150 days later, Neil Armstrong stepped out of the Apollo 11 lunar module onto the surface of the moon, launched there by engines and rocket stages tested right here at Stennis.

So, we are definitely going to celebrate in a big way next month. The way I see it, there are two really good reasons to celebrate such important anniversaries, whether they are space-related or not.

For one, it reminds us of what we once did, and that feels good. Ark! I still tell stories about my “glory days” as wide receiver for my hometown Lowland Swampers team.

Even more importantly, though, celebrating anniversaries reminds us of what we yet can do – if we set our minds and energies to it. That's pretty important at a time like this, when we're talking about going to Mars.

Can we do it? You bet we can. How do I know? Because we went to the moon when no one else could, when no one knew for sure that anyone could. No one else did that then – or since.

We did it, though – thanks to all those engineers and operators who worked all day and night for 15 seconds of hot fire, and to everyone else who built this place and kept it running. They not only made it possible; they made it happen.

We'll do it again, too, and for the same reason – because the people right here make it possible. Ark!



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FULFILLING NASA'S EXPLORATION MISSION

NASA marks key milestone with test of RS-25 flight engine

NASA successfully tested the first deep space RS-25 rocket engine for 500 seconds March 10, clearing a major milestone toward the next great era of space exploration. The next time rocket engine No. 2059 fires for that length of time, it will be carrying humans on their first deep-space mission in more than 45 years.

“What a great moment for NASA and Stennis,” said Rick Gilbrech, director of NASA’s Stennis Space Center in Bay St. Louis, Mississippi. “We have exciting days ahead with a return to deep space and a journey to Mars, and this test is a very big step in that direction.”

The hot fire marked the first test of an RS-25 flight engine for NASA’s new Space Launch System (SLS), being built to carry humans on future deep-space missions, including an asteroid and Mars. Four RS-25 engines will help power the SLS core stage.

RS-25 engine No. 2059 and two other flight engines, scheduled for testing at Stennis in the coming months, will help launch SLS for the first Orion crewed mission, known as Exploration Mission-2. (The fourth engine that will help power the flight has already flown into space and will not require additional testing.)

The EM-2 mission is expected to carry four astronauts into lunar orbit to test key elements of the spacecraft. It will mark the first American flight to carry humans beyond low-Earth orbit since Apollo 17 in 1972.

The engines used on initial SLS missions are flight engines remaining from the Space Shuttle Program, workhorse engines that are among the most proven in the world, having powered 135 space shuttle missions from 1981 to 2011. For the SLS vehicle, the engines will fire at 109 percent thrust level and provide a combined two million pounds of thrust.

“Not only does this test mark an important step towards proving our existing design for SLS’s first flight,” said Steve Wofford, engines manager at NASA’s Marshall Space Flight Center in Huntsville, Alabama, where the SLS Program is managed for the agency, “but it’s also a great feeling that this engine that has carried so many astronauts into space before is being prepared to take astronauts to space once again on SLS’s first crewed flight.”

NASA is developing the SLS rocket to carry humans deeper into space than ever before, including to an asteroid by 2025 and to Mars in the 2030s. The initial configuration of the rocket will have a minimum 70-metric-ton (77-ton) lift capability and be powered by the four RS-25 engines, operating in conjunction with a pair of solid rocket boosters.



NASA engineers conduct a successful test firing of RS-25 rocket engine No. 2059 on the A-1 Test Stand at Stennis. The hot fire marks the first test of an RS-25 flight

NASA and Aerojet Rocketdyne, the prime contractor for RS-25 engine work, conducted a series of developmental tests on the RS-25 engine last year at Stennis, primarily to validate the capabilities of a new controller – or, “brain” – for the engine and to verify the different operating conditions needed for the SLS vehicle. Following the March 10 firing, Stennis and Aerojet Rocketdyne will conduct another development engine

engine for NASA’s new Space Launch System (SLS) vehicle. Four RS-25 engines, in conjunction with a pair of solid rocket boosters, will power the SLS at launch.

series to test new flight engine controllers and will also continue to test RS-25 flight engines. In addition, the space agency is preparing the B-2 Test Stand at Stennis to test the SLS core stage that will be used on the rocket’s first flight, Exploration Mission-1. Core stage testing will involve installing the flight core stage on the B-2 stand and firing its four RS-25 rocket engines simultaneously.

The March 10 test was conducted for a full-duration 500 seconds, the same amount of time the engines must fire during an actual launch.

“One more powerful step forward accomplished on the SLS journey,” said Ronnie Rigney, RS-25 project manager at Stennis. “It really feels great to be part of such an important program in our nation.”

For additional information about NASA’s journey to Mars, see: www.nasa.gov/journeymars

FULFILLING NASA'S EXPLORATION MISSION

NASA astronaut Kelly completes record-breaking mission



(Left photo) Expedition 46 Commander Scott Kelly of NASA rests in a chair outside of the Soyuz TMA-18M spacecraft just minutes after he and cosmonauts Mikhail Kornienko and Sergey Volkov of the Russian space agency Roscosmos landed in a remote area near the town of Zhezkazgan, Kazakhstan late March 1. Kelly and Kornienko completed a record year-long International Space Station mission to collect valuable data on the effects of long duration weightlessness on the human body that will be used to formulate a human mission to Mars.

(Top photo) NASA astronaut Scott Kelly shared a sunrise photograph March 1, 2016, as he prepared to depart the space station and return to Earth aboard a Soyuz TMA-18M spacecraft.

NASA astronaut and Expedition 46 Commander Scott Kelly and his Russian counterpart Mikhail Kornienko returned to Earth on March 1 after a historic 340-day mission aboard the International Space Station. Joining their return trip aboard a Soyuz TMA-18M spacecraft was Sergey Volkov, also of the Russian space agency Roscosmos, who arrived on the station Sept. 4, 2015.

“Scott Kelly’s one-year mission aboard the International Space Station has helped to advance deep space exploration and America’s Journey to Mars,” said NASA Administrator Charles Bolden. “Scott has become the first American astronaut to spend a year in space, and in so doing, helped us take one giant leap toward putting boots on Mars.”

During the record-setting One-Year mission, the station crew conducted almost 400 investigations to advance NASA’s mission and benefit humanity. Kelly and Kornienko specifically participated in a number of studies to inform NASA’s Journey to Mars, including research into how the human body adjusts to weightlessness, isolation,

radiation and the stress of long-duration spaceflight. Kelly’s identical twin brother, former NASA astronaut Mark Kelly, participated in parallel twin studies on Earth to help scientists compare the effects of space on the body and mind down to the cellular level.

The crew took advantage of the unique vantage point of the space station, with an orbital path that covers more than 90 percent of Earth’s population, to monitor and capture images of our planet. They also welcomed the arrival of a new instrument to study the signature of dark matter and conducted technology demonstrations that continue to drive innovation, including a test of network capabilities for operating swarms of spacecraft.

Kelly and Kornienko saw the arrival of six resupply spacecraft during their mission. Kelly ventured outside the confines of the space station for three spacewalks during his mission. Including crewmate Gennady Padalka, with whom Kelly and Kornienko launched on March 27, 2015, 13 astronauts and cosmonauts representing seven differ-

ent nations (the United States, Russia, Italy, Japan, Denmark, Kazakhstan and England) lived aboard the space station during the yearlong mission.

With the end of this mission, Kelly now has spent 520 days in space, the most among U.S. astronauts. Kornienko has accumulated 516 days across two flights, and Volkov has 548 days on three flights.

Expedition 47 continues operating the station, with NASA astronaut Tim Kopra in command. The International Space Station is a convergence of science, technology and human innovation that enables the demonstration of new technologies and makes research breakthroughs not possible on Earth. It has been continuously occupied since November 2000 and remains the springboard to NASA’s next giant leap in exploration, including future missions to an asteroid and Mars.

For more about the one-year mission, visit: <http://www.nasa.gov/oneyear>.
For more on the International Space Station, visit: <http://www.nasa.gov/station>.

1981 – Stennis helps power space shuttle era

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.

In the first 20 years of Stennis Space Center's history, major contributions by NASA and contractor employees played an important role in the successful debut of the nation's Space Transportation System (STS). Leading up to NASA's maiden space shuttle mission on April 12, 1981, there was an air of excitement at the then-National Space Technology Laboratories (NSTL) as the country prepared to send explorers into space for the first time in more than five years.

The year 1981 began with the final preflight test of the space shuttle's main propulsion system at NSTL. Main engine testing was then conducted by the Rockwell Division of Rockwell International Space Operations under the direction of NASA's Marshall Space Flight Center. The Jan. 17 test was described as the 12th and longest firing, lasting 10 minutes and 29 seconds. The total firing time on the main propulsion test article (MPTA) amounted to one hour – the equivalent of more than seven shuttle flights.

As constructed on the B-2 Test Stand, the shuttle's MPTA consisted of three high-performance, liquid-fueled main engines mounted in a simulated tail section of an orbiter; a large external propellant tank; and associated hardware. At launch, the shuttle's main propulsion system, together with its two solid rocket boosters, generated the thrust necessary to propel the vehicle on its flight to orbit.

During the 6 a.m. liftoff on April 12, 1981, the three main engines, all tested for flight certification at NSTL, roared to life as Columbia, with astronauts John Young and Robert Crippen aboard, rose from Launch Pad 39A at Kennedy Space Center in Florida. Millions watched as Columbia began its journey into Earth orbit. From main

engine start to orbiter touchdown at Edwards Air Force Base in California, Columbia performed flawlessly on its maiden voyage, raising the curtain on America's new era in space.

"All of us at NSTL are extremely proud to have played such a vital part in the first space shuttle flight," said NSTL Manager Jerry Hlass. "It is a tribute to NASA and contractor personnel here who worked so very hard to do the developmental testing and certification of these engines – and to the thousands of Americans involved in the Space Shuttle Program since its inception. History was made with this successful flight and landing of Columbia, and we can all remember with pride our contribution."

Just 24 days after the historic STS-1 mission, Young and Crippen visited NSTL to thank employees for their "superb contribution" and to give a report of their flight. They spoke to several hundred employees. "I think you can be very proud of your contributions to the first space shuttle flight," Young said. "I really am proud to have been associated with you because this vehicle is built for the

future – the '80s and '90s."

During Young's and Crippen's first NSTL visit on July 2, 1980, they had viewed a test firing of a space shuttle main engine. "Flying on top of the vehicle is just a little different than watching the test stand in operation," Young said.

Crippen added, "You can't do this kind of program without running an extensive test program on it, and this effort that you contributed is why John and I got to sit back and ride. We couldn't even make it look hard."

With the shuttle's first test flight successfully completed, Young looked to the future of the STS and commended NSTL's test program. "You've given the country a vehicle that will do important things for it in the future," he said.



Astronauts John Young and Bob Crippen lift off on space shuttle Columbia on the STS-1 mission, NASA's first aboard a reusable spacecraft.

Office of Diversity and Equal Opportunity

Honoring women in public service, government

This year for Women's History Month, we recognize Col. Oveta Culp Hobby, a pioneering military leader who helped define women's initial role in the U.S. Army during World War II. Hobby and many other women who served with distinction ushered in an era of change that far exceeded the military's expectations.

By 1941, as the United States edged closer to entering World War II, men were being drafted for military service, the first peacetime draft in American history. During that time, as many as 10,000 letters a day poured into the Capitol from women seeking to support the war effort by whatever means they could.

In 1941, Gen. David Searles asked Oveta Culp Hobby, the wife of the former governor of Texas, to direct a women's initiative in support of the Army. At the time, she served on the Texas State Committee for Human Security, an organization that solicited funds for blind and needy children. Hobby declined, stating she could not be away from her family.

Searles then proposed that she outline what such an organization would look like for women who wanted to contribute. She sent him a proposed organizational chart. He asked her again to serve as chief of the Women's Interest Section, Bureau of Public Affairs, for the War Department. She refused a second time.

When her husband heard about the offer, he told her, "Any thoughtful person knows that we are in this war, and that every one of us is going to have to do whatever we are called on to do." She then accepted the job. At a salary of a dollar a year, Hobby moved to Washington, D.C., and served in this position for one year before her mandate changed with the country's declaration of war on Dec. 8, 1941.

In 1942, Hobby became the first director of the newly-formed Women's Army Auxiliary Corps (WAAC), renamed the Women's Army Corps (WAC) in 1943. First a major, then a colonel, Hobby was a one-person recruiting marathon. She proved herself a masterful speaker, persuading large numbers of women to take the unprecedented step of enlisting.

During the first year, Hobby often had to fight to get resources and recognition for her female soldiers. Challenging all gender norms, the Corps faced opposition from both the civilian public and the exclusively male military. Her job involved a difficult balancing act between concerns that being in the Army seemed unladylike and fears that women would become a corruptive influence on the male soldiers. Many commanders were fearful of the effects of fraternization between soldiers and WACs. They

went to extraordinary lengths to limit contact, restricting the nights that women were allowed to go out on army bases after hours or even fencing in the women's barracks.

In spite of the discrimination they faced, WACs proved invaluable to the war effort. By the end of Hobby's tenure, WACs filled 239 different army positions, more than four times initial estimates. Within two years, there were requests for more than 600,000 WACs from around the world, though the strength of the women's army was not authorized to exceed 200,000. Ultimately, WACs were posted in Europe, the South Pacific and the China-India-Burma Theater. Everywhere they went, they served with distinction, despite the continuing discrimination.

In July 1945, with the war in Europe at an end and the Japanese close to surrender, Hobby resigned her commission. She was awarded the Distinguished Service Medal – the first and only WAC to receive this medal during World War II.

As a private citizen, Hobby served as director of the Houston radio station KPRC (Kotton Port Rail Center) and the new KPRC-TV, and executive vice president of the Houston Post.

In 1953, she was called on by President Dwight D. Eisenhower to serve as the first Secretary of the Department of Health, Education and Welfare, a position that she held until 1955.

In 1978, she was awarded the George Catlett Marshall Medal from the Association of the United States Army for meritorious public service, and the Alumni Association Gold Medal for Distinguished Public Service from Rice University. In 1996, Hobby was inducted into the National Women's Hall of Fame.

Hobby died August 16, 1995, at the age of 90. She left behind a legacy of service to her country. Her outstanding performance in the offices she held blazed new trails, enabling countless other women to occupy leadership positions that had historically been unattainable.

The World War II Memorial in Washington, D.C. includes quotes from war leaders, including Presidents Franklin Roosevelt and Harry Truman, Gens. Dwight Eisenhower and Douglas MacArthur, and Adm. Chester Nimitz. The only woman quoted on the memorial is Hobby, who said: "Women who stepped up were measured as citizens of the nation, not as women. This was a people's war and everyone was in it."

Portions of this article were adopted from the Defense Equal Opportunity Management Institute (DEOMI).

Stennis hosts employee health and wellness fair



Stennis Space Center employees participate in an onsite Health and Wellness Fair on March 10, collecting information about healthy lifestyle activities and products. The fair featured exhibits by a variety of area organizations and companies, including those related to nutrition, physical health, exercise and emotional well-being. The fair also featured an opportunity for employees to obtain blood pressure readings and glucose screenings.



Hail & Farewell

NASA welcomes the following:

Stacie Woolridge

Management Support Assistant

Engineering & Test Directorate

Pearl River flood waters encroach on Stennis



Stennis exhibited signs of inundating flood waters during mid-March. Drenching rains and traditional spring runoffs combined to flood numerous communities and areas during the second week in March. At Stennis, rising

water cut off access to some roads and left at least one riverside dock and gathering area under water. Rising river water along I-10 could be measured against the Stennis buffer zone sign.

