National Aeronautics and Space Administration

John C. Stennis Space Center

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Endeavour lifts off

Right on schedule, space shuttle Endeavour lifted into the early night sky Nov. 14 on a 15-day mission to the International Space Station.

The STS-126 mission is delivering equipment to the space station that will allow more crew members to occupy the complex. This includes a reusable logistics module that will hold supplies and provide additional crew quarters, additional exercise equipment for astronauts, equipment for the regenerative life support system and spare hardware for the station.

A milestone test

Stennis certifies final shuttle flight engine

Steam blasts out of the A-2 Test Stand at Stennis Space Center on Oct. 22 as engineers begin a certification test on engine 2061, the last space shuttle main flight engine scheduled to be built (see Page 4 article). Since 1975, Stennis has tested every space shuttle main engine used in the program – about 50 engines in all. Those engines have powered more than 120 shuttle missions – and no mission has failed as a result of engine malfunction. For the remainder of 2008 and throughout 2009, Stennis will continue testing of various space shuttle main engine components.

Stennis focuses on safety

Stennis Space Center Acting Director Gene Goldman speaks to employees during annual Safety/Mission Success Day activities Oct. 23. During the day, Stennis employees were able to attend various informational sessions and gather materials on personal, home and workplace safety. Special focus was given to the ongoing Voluntary Protection Program designed to raise safety awareness at Stennis.

From the desk of

Gene Goldman

Acting Director
Stennis Space Center

As the first steel column was set on the A-3 Test Stand the morning of Wednesday, Oct. 29, Stennis Associate Director Patrick Scheuermann remarked, "We're about seventy feet closer to the moon." It is a great thought, and it is indicative of the role we at Stennis have in this return trip. Once again, this small center has an enormous responsibility.

We tend not to think of where we fit in the big picture as we embark on this remarkable journey of exploration. However, here we are on the schedule's critical path for altitude testing of the upgraded J-2X engine on A-3.

The combined capabilities of this test stand will be singular in the world. The use of multiple chemical steam generators in series to create this environment presents significant, unprecedented technical challenges, aside from performing the engine tests. The construction schedule, the E-Complex test series supporting facility design, and stand activation are only a few of the numerous hurdles we have to clear successfully. This center has been there.

The A-3 stand is the first major test facility to be built here since the Apollo Program. It will provide a unique capability for the nation; it provides us a unique opportunity. The decision to build it here has been challenged in several arenas, and there are many who question our ability to manage this project. Some of them are here.

Yet, structural steel is being erected, the canal banks are being graded, and subscale tests echo from E Complex. We have stumbled in some early efforts, and we have learned some lessons. We will make more mistakes, but we will make progress.

"We do these things, not because they are easy, but because they are hard," John F. Kennedy said as he threw the symbolic cap of our country over the lunar fence. The words still resonate with inspiring clarity today.

Lunar propulsion testing is in our hands; it will take our collective effort. It has been done here before, and we will do it again. The United States is returning to the moon on its way to possible journeys beyond the lunar surface, and the trajectory passes through Stennis Space Center.

Dream big; work harder!

Stennis kicks off Combined Federal Campaign

Former Stennis Space Center Director Bob Cabana addresses employees during a kickoff for the Stennis' 2008 Combined Federal Campaign on Oct. 16. The Combined Federal Campaign is the largest annual workplace charity effort and supports organizations providing health and human service benefits throughout the world. Stennis set a goal of $190,000 for the two-week campaign that ended Oct. 31. By mid-November, more than $133,000 had been received from Stennis employees. Donations still can be made through Dec. 5 and be counted in the 2008 total.

FULFILLING NASA'S EXPLORATION MISSION

Steel work begins on A-3 Test Stand

It has been 40 years since the skyline has changed at NASA's John C. Stennis Space Center, but a new 300-foot rocket engine test stand is beginning to rise above the trees.

A-3 Test Stand Construction – 2008

A -2 Test Stand construction - mid 1960s

E Test Complex construction – early 1990s

Fabricated steel began arriving by truck Oct. 24 for construction of the A-3 Test Stand that will be used to test the engine for the nation's next generation of moon rockets. Within days, workers from Lafayette Steel Erector Inc. began assembling the 16 steel stages needed on the foundation and footings poured in 2007.

By the time the initial phase of construction is complete in April 2009, some 4 million pounds of fabricated steel will be in place – and Stennis Space Center will have a towering structure that will be used to test the J-2X engine in development, said Robert Ross, deputy project manager for the A-3 Test Stand. That engine will help send humans back to the moon and possibly beyond.

Work on the A-3 stand began with groundbreaking ceremonies in August 2007. At that time, NASA Deputy Administrator Shana Dale spoke of the historic nature of the project.

"Groundbreakings are about new beginnings," Dale said. "And today, we're breaking ground for a new test stand, for the new spacecraft of a new era of exploration."

A pair of new rockets is being developed as part of NASA's Constellation Program – the Ares I crew launch vehicle and the Ares V cargo launch vehicle. In addition to helping humans go back to the moon and possibly beyond, the spacecraft will be used to send astronauts to the International Space Station. The new J-2X engine will help power both vehicles.

The engine will be required to start at high altitudes. However, none of the existing test stands at Stennis could simulate the needed firing conditions. The A-3 Test Stand is designed to test the new engine at sea level and also to simulate altitudes up to 100,000 feet.

The design calls for the new stand to withstand 1 million pounds of thrust. Even though the J2-X will produce just 294,000 pounds, "who knows what may be needed in the future," Ross said.

In addition to steel work under way, Stennis engineers are scheduled to award a contract for test cell diffuser work in January. A contract to complete the general work of the project will be awarded in February.

Coordinating the work of all the companies throughout the upcoming months poses one of the biggest challenges, Ross noted. In addition, Stennis engineers are focusing on ensuring all NASA-supplied equipment and materials are on hand when needed, which is a challenging task. At the same time work is progressing on the steel fabrication, contractors are initiating construction of docks needed to deliver propellants to the A-3 stand. Two docks – one for liquid hydrogen delivery and one for liquid oxygen delivery – are being built. That work is scheduled to be complete by April 2009 as well.

Ross acknowledged delays have caused some to question the status of the project. However, he said all is on schedule to meet the May 2011 "need" date for the stand's completion.

"This is a tremendous time for everyone involved with the space program," Ross said. "Like everyone else involved, I feel lucky to be part of this project. For the rest of our lives, we'll be able to look at the stand and all it enabled and say, 'I worked on that.'"

Final shuttle flight engine t

The silence that followed the shake, rattle and roar of the space shuttle main engine test Oct. 22 at NASA's John C. Stennis Space Center may have signaled more than a successful completion of 520 seconds of high-pressure firing.

It also may have marked the end of an era – certification of the final flight engine (No. 2061) built for the nation's Space Shuttle Program, which is scheduled to end in 2010. Stennis will continue testing space shuttle main engine components through 2009.

Meanwhile, observers viewed the Oct. 22 test as historic.

"This is a milestone (for NASA and Stennis)," said Don Beckmeyer, space shuttle main engine test project manager at Stennis. "There is nothing like the space shuttle engine. It is probably one of the most complicated pieces of machinery ever built."

Larry Pigott has been involved with the shuttle program since 1981 and approached the final flight engine test with mixed emotions.

"We're happy because it's such a great program, but it's sad because it's coming to an end," said Pigott, Marshall Space Flight Center's space shuttle main engine senior technical representative at Stennis. "This program is like family. I always have been excited to be a part of it."

Space shuttle main engine 2061 was built by Pratt & Whitney Rocketdyne and delivered from Kennedy Space Center in Florida to Stennis for certification testing in October. Since 1975, every main engine used in the Space Shuttle Program has been proven flight worthy at Stennis.

During that time, about 50 main engines have been certified for use on more than 120 shuttle missions. Certified engines can be used to power more than a dozen flights before being recertified, yet no shuttle mission has failed as a result of engine malfunction.

That is key because the focus always has been on ensuring the safety of astronauts, Pigott explained.

"This engine is such a good design, and we built redundancies into it to ensure safety, because we always have to take care of our astronauts," he said. "That's why we test so much, to make sure everything works as it should. This work is much too important, and our astronauts are much too valuable to make mistakes."

At one point, all three test stands at Stennis were involved in shuttle engine testing. Today, testing for the program occurs on the A-2 Test Stand as Stennis engineers prepare for certifying the J-2X engine currently in development.

The J-2X engine will help power the Ares I and Ares V rockets that will take humans back to the moon and possibly beyond as part of NASA's Constellation Program.

The Constellation Program grew out of President George W. Bush's challenge in 2004 to complete the International Space Station, retire the space shuttle in 2010 and build new space vehicles to go back to the moon by 2020.

Work is progressing toward those goals.

Now proven flight worthy, engine 2061 will be shipped back to Kennedy for installation on an orbiter. It is one of 14 flight engines Kennedy will use for the remaining shuttle missions.

Meanwhile, engineers at Stennis will return one of two development engines located at the facility back to the A-2 Test Stand to continue component testing for the Space Shuttle Program.

Space shuttle main engine 2061 is prepared for shipme
(top), is unpacked at Stennis Space Center (center) an
cation testing (bottom). The engine was tested Oct. 22

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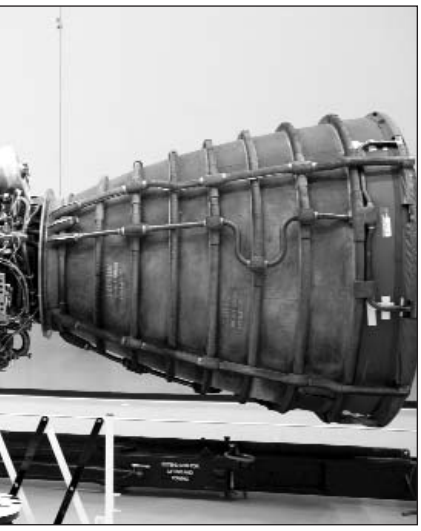


ent from Kennedy Space Center in Florida
d is installed onto the A-2 Test Stand for certifi-

Stennis named twice on top 50 spinoffs list

As part of its 50th anniversary celebration, NASA recently selected its top 50 "spinoff" technologies developed as a result of the space program.

A pair of technologies developed in conjunction with John C. Stennis Space Center made the list, including one described as an "all-star" development.

Spinoff: 50 Years of NASA-derived Technologies (1958-2008) celebrates the impact the national space program has had on everyday life. It cites technologies developed for space exploration that also have been used to spur the economy and improve lives. These include technologies related to artificial limbs, anti-icing systems on airplanes, heart pumps, firefighter gear, enriched baby food, computer software, food safety, automobile performance, water purification and even safe land mine removal.

The revolutionizing technologies cited in the publication include the development of a one-of-a-kind arbitrary shape deformation (ASD) software capability that enhances how designers are able to study and design fluid flow components. Before the ASD software was developed, designers sometimes would spend days, weeks and even months creating workable flow models. With the new software, designers are able to create models much more quickly and efficiently.

The ASD software was developed by Optimal Solutions Software LLC in partnership with Stennis engineers. NASA has used the software in designing spacecraft shapes, propulsion devices, pumps, valves, fittings and other components.

ASD software also has been adapted for use in a host of commercial areas, including aircraft, automobile and golf club design; swimming and boating aerodynamics; and even model airplane construction. In addition to the ASD software, NASA's top 50 spinoff list includes the Earth Resources Laboratory Applications Software (ELAS) developed at Stennis in 1978. Since that time, ELAS has been used worldwide for processing satellite and airborne sensor imagery data of Earth's surface into readable and usable information.

ELAS "aided users greatly" in making mapping information accessible, said Ray Seyfarth, one of the original developers of the program and now a computer science professor at the University of Southern Mississippi in Hattiesburg.

Considered an all-star development and recognized by the Space Technology Hall of Fame in 1992, ELAS has been used in various ways, including studying urban growth in the Nile River Delta, enhancing earthquake preparedness programs and enabling development of the DIPEx image software employed by computer users worldwide. The DIPEx software is a true homegrown product of Stennis research; it was developed by DATASTAR Inc., which is based in nearby Picayune.

After 30 years, the ELAS concept continues to prove its value. Ramona Pelletier Travis worked with ELAS as a research scientist at Stennis in the 1980s. "ELAS has been a great example of good government research spinning off to benefit the private sector in a significant way over a long period of time," she said.

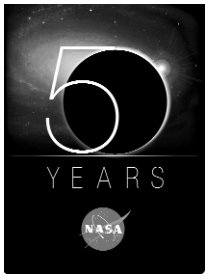
Travis now serves as manager of the Innovative Partnerships Program at Stennis, working to enable continued spinoff developments. IPP has offices at all NASA centers and uses investments and partnerships to provide the technology and capabilities NASA needs to meet its mission goals.

To obtain *Spinoff* copies, visit www.sti.nasa.gov/tto/index.html

15 Stennis employees receive Silver Snoopy awards

Astronauts James Dutton Jr. and Stephen Robinson stand with Silver Snoopy award recipients, all employees of NASA's John C. Stennis Space Center. Fifteen individuals received the prestigious awards for outstanding flight safety and mission success during an Oct. 22 ceremony. Pictured are (l to r) Robinson; recipients Lester Langford of Slidell, La., senior engineer for Jacobs Technology NASA Test Operations Group (NTOG); Alan Phillips of Picayune, electrical shop supervisor with Jacobs Technology Facility Operating Services Contract (FOSC) Group; Ken Cook of Long Beach, space shuttle main engine instrumentation engineer for Pratt & Whitney Rocketdyne (PWR); Jeanette Stogner of Picayune, real property specialist with FOSC; Greg Condiff of Waveland, space shuttle main engine configuration management analyst for PWR; Pennie Turner of Gulfport, management support assistant with NASA Engineering & Test Directorate; Robert "Chops" Williams of Bay St. Louis, chief storekeeper for FOSC; Cory Acosta of St. Bernard, La., lead test engineer for PWR; Michael Slade of Picayune, facilitator with NTOG; and Frank Milstead of Butler, Ala., retired quality assurance specialist with the Defense Contract Management Agency; Stennis Associate Director Patrick Scheuermann; recipients David "Skip" Roberts of Gautier, A-2 Test Stand lead mechanical operations engineer for NASA; Gary Bennett of Pearlington, facilitator for NTOG; and Larry Giveans Jr. of Waveland, space shuttle main engine systems design analyst for PWR; Dutton; and recipient Lamar Nicholson of Ocean Springs, senior computer scientist with Computer Sciences Corp. Not pictured is Bruce Hummel of Hattiesburg, a laboratory metrologist with Applied Geo Technologies.

Stennis marks anniversary of RS-68 testing



Editor's Note: *NASA's John C. Stennis Space Center has played a pivotal role in the success of the nation's space program. Each month, Lagniappe looks back on important moments in the center's history.*

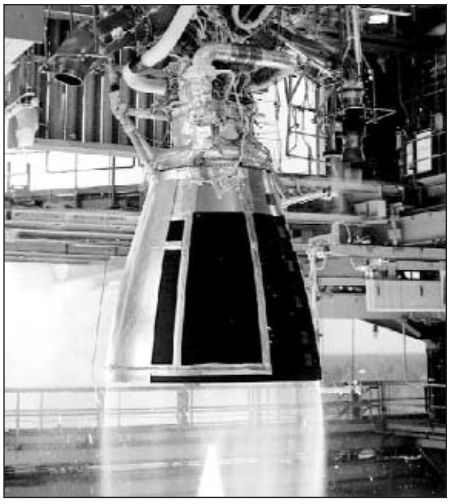
Ten years ago, The Boeing Company announced its decision to build and test the RS-68 rocket engine at NASA's John C. Stennis Space Center. The decision marked NASA's first long-term commitment to allow Stennis' facilities to be used for commercial purposes.

Boeing designed the RS-68 to power the company's Delta IV rocket as part of the Evolved Expendable Launch Vehicle Program, a U.S. Air Force-led effort to build a family of expendable rockets that would reduce the costs of launching American payloads into space. The first RS-68 engine test occurred on position "B" of Stennis' upgraded B-1 Test Stand in September 1999.

In 2005, Pratt & Whitney acquired the Rocketdyne Propulsion and Power Unit from Boeing. Pratt & Whitney Rocketdyne is now the prime contractor for the RS-68. Shortly after NASA announced plans for the Constellation Program, which will carry astronauts back to the moon and possibly beyond, the RS-68 engine was chosen to power the core stage of the Ares V launch vehicle designed to carry large payloads into space and to the moon.

While serving as project manager for the Evolved Expendable Launch Vehicle Program, current Stennis Space Center Associate Director Patrick Scheuermann was instrumental in the decision to test the RS-68 engine at the south Mississippi site.

All RS-68 engines are still assembled and test-fired at Stennis Space Center.



An RS-68 engine is test-fired by engineers at Stennis Space Center.

Give thanks – celebrate diversity

From the **Office of Diversity and Equal Opportunity**

At this time of year, it is worthwhile to remember diversity is not new to America. The adults and children who feasted at the first thanksgivings in 1621 were immigrants joined by Native Americans who were the first settlers in North America.

Thanksgiving is the one day of the year that encourages us to step back and give thanks for all we have. Like many American holidays, it is rooted in the celebrations of other cultures. Indeed, people from cultures all over the world celebrate the communal gathering of a good crop. The mode of celebration differs, but prayer, parades and feasts are common with shared feelings of gratitude, harmony and peace.

Canada – The first Canadian Thanksgiving Day was celebrated in 1872 in gratitude for the Prince of Wales' recovery from a serious illness. It is now a three-day celebration.

Ghana and Nigeria – The Yam Festival – named after one of Africa's most common foods – is usually held in August at the end of the rainy season.

China – The Harvest Moon Festival is a celebration of abundance and togetherness. Family and friends share "mooncakes" as a way of giving thanks.

Britain – During Harvest Festival in October, people decorate churches with fruit, vegetables, flowers and wheat and donate a portion of the harvest to poor people.

Korea – Chusok is a harvest celebration when family members visit tombs of ancestors and offer them rice and fruit.

Vietnam – Têt-Trung-Thu (the Children's Festival) takes place Aug. 15. Children are the center of the holiday.

South America – Many native Indian cultures contain expressions of gratitude and thanksgiving.

Succoth – The Jewish Harvest Festival also is known as the "Festival of Booths," "Feast of Tabernacles" or "Festival of the Harvest." It celebrates Israelites' 40 years of wandering in the Sinai Desert, their faithfulness to Yahweh and their deliverance into the Promised Land.

South India – Pongal is a three-day celebration giving thanks to the rain, sun and the farm animals that helped in the harvest.

Japan – Nov. 23 is a national holiday known as "Kinro-Kansha-no-hi," or Labor Thanksgiving Day.

"We are a nation of people who have come from many countries, cultures and creeds. The colonial Thanksgiving at Plymouth in 1621, when the pilgrims of the Old World mingled in fellowship and celebration with the American Indians of the New World, foreshadowed the challenge and opportunity that such diversity has always offered us: to live together in peace with respect and appreciation for our differences and to draw on one another's strengths in the work of building a great and unified nation."
(William J. Clinton Presidential Proclamation 1998)

Hail & Farewell

NASA bids farewell to the following:

Jared Congiardo	AST, Theoretical Simulation Tech Engineering and Test Directorate
Bob Cabana	Center Director Office of the Director
Leana Marshall	Student Trainee Office of Procurement

And welcomes the following:

Donna Dubuisson	AST, Quality Assurance Office of Safety & Mission Assurance

Correction: It was incorrectly noted last month that Jared Grover was leaving Stennis. It should have read Jared Congiardo.

@ Stennis

What does it mean to you to see steel going up on the first new test stand at Stennis in 40 years?

Editor's Note: *@ Stennis is a monthly feature highlighting the views and opinions of Stennis Space Center employees.*

"Being here for 37 years, I've seen a lot of progress at Stennis. It's great to see that engine testing will remain part of the future." **Jeanette Stogner, Jacobs FOSC**

"As an 'old timer' who worked here for the first static test in 1966, it's extremely exciting to be around 40 years later to witness another step in the history of Stennis." **Pennie Turner, NASA**

"It really is amazing to see how fast the skyline at Stennis is changing." **Scott Olive, NASA**

"I was here for the very first test in 1966 and I'm still here for the building of a new test stand to test engines that will take us back to the moon. I'm proud to be a part of it all." **Sheilah Ware, Jacobs FOSC**

FIRST LEGO volunteers sought

Education leaders at Stennis Space Center are seeking volunteers and judges to assist in the Mississippi Championship FIRST LEGO League competition scheduled for Dec. 6 at Mississippi Gulf Coast Community College in Gautier.

During the daylong competition, teams use LEGO® MINDSTORMS® NXT robots constructed to complete assigned missions. They also present research on a selected topic, which is "Climate Connections" for this year's competition.

A local competition was held Nov. 15 at Mississippi State University in Starkville. Persons who wish to volunteer for the Dec. 6 competition should call Randall Hicks at 228-688-3653 or e-mail him at randall.t.hicks@nasa.gov.

FIRST LEGO League participants prepare their robot for its assigned mission during a Nov. 15 local competition in Starkville.

Girl Scouts enjoy visit to StenniSphere

Junior Girl Scout Elizabeth Kubachek (right) with Gulf Pines Council Troop 746 from Hattiesburg uses her aerospace merit badge leadership skills to assist a fellow scout in a kite-building activity during an Oct. 18 visit to StenniSphere, the visitor center at Stennis Space Center. The Mississippi Girl Scouts toured the StenniSphere facility and participated in various hands-on activities to earn their aerospace merit badges.

Stennis hosts educators

Steve Culivan, aerospace education specialist at Stennis Space Center, conducts a professional development workshop for fourth- through ninth-grade educators. During the Nov. 4 "Learning with the Stars" workshop, educators spent time learning about different aspects of the universe and enjoying a presentation of Stennis' portable planetarium.

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