National Aeronautics and Space Administration

John C. Stennis Space Center

LAGNIAPPE

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Scheuermann appointed deputy director

NASA has named Patrick Scheuermann as the deputy director of NASA's John C. Stennis Space Center. The promotion of Scheuermann, previously the center's associate director, became effective Dec. 21.

"Patrick has done an outstanding job as associate director, and I look forward to working alongside him as our new deputy director," Stennis Space Center Director Gene Goldman said. "He is certainly a valuable asset to our team."

A New Orleans native, Scheuermann served as chief operating officer of NASA's Michoud Assembly Facility in New Orleans from August 2005 until he departed for Stennis. He served as deputy director of center operations at Stennis prior to his move to Michoud.

"It is an honor to be a part of the great team at Stennis," Scheuermann said. "We have a lot of exciting work ahead of us as NASA transitions from the Space Shuttle Program to the Constellation Program. The path to send astronauts back to the moon leads directly through Stennis Space Center. I'm ready to meet these challenges head-on in my new role."

STS-126 crew members visit Stennis

Stennis Space Center Director Gene Goldman (center) stands with astronauts Christopher Ferguson (right) and Heidemarie Stefanyshyn-Piper in front of the A-2 Test Stand during the space shuttle crew members' visit to NASA's rocket engine testing facility Jan. 13. During their visit, Ferguson and Stefanyshyn-Piper reported on the STS-126 space shuttle delivery and servicing mission to the International Space Station. They thanked Stennis Space Center workers for providing shuttle main engines that "performed as advertised." Ferguson served as commander of the mission. Stefanyshyn-Piper served as a mission specialist and as the first female lead spacewalker for a shuttle mission. On the 16-day mission in November 2008, crew members delivered equipment to expand the space station and performed needed maintenance on the station.

CFC

Stennis' 2008 Combined Federal Campaign Goal – $190,000

Stennis' Total 2008 Campaign Contributions – $198,583.28

Percentage of Goal – 105%

From the desk of

Gene Goldman

Director
Stennis Space Center

Happy New Year!!! I hope all had a wonderful holiday season. The year 2008, "a tumultuous uproar," is behind us; '09 and the future are before us. It's a time we can pause to consider our direction and what we're about.

Stennis Space Center was built to test engines and stages for the Apollo Program, and efforts to close the center were in the works before that testing ended. Space Shuttle Main Engine development eventually followed, leading to a long history of support that continues today. Though some NASA science programs, as well as state and federal tenants, have located here, our main function is testing.

Unfortunately, many past decisions regarding infrastructure and process control at Stennis were made to address short-term concerns. Often, the choices were driven by budget or schedule constraints. We're still paying for those decisions today, but this remains NASA's center for propulsion testing. As Dr. Griffin has stated, Stennis is "the only place in the country where we can do long-duration testing of liquid engines." We have many roles, but that is our future, our reason for being.

We're continuing to test Space Shuttle Main Engines; we're in early testing for J-2X; we're building the A-3 Test Stand to provide a unique altitude test capability. E Complex testing is supporting design for A-3 and the Constellation Program. In addition, we are preparing to test Taurus engines for a contractor seeking to service the International Space Station. Rolls-Royce is testing jet engines onsite and will be expanding that effort during the next several years. We continue to test, and our future looks bright.

We can't control what priorities the new administration will dictate. However, we can accomplish assigned projects in an exemplary manner. This means developing and adhering to rigorous procedural structure, assuring "we do what we say." The safety of our astronauts depends on that promise. Our ability to obtain test programs depends on that commitment as well. That is in our control.

John Ruskin said, "When we build, let it not be for present use alone. Let it be such work as our descendants will thank us for." Let us build our center capabilities just so.

Dream big; work harder.

Congressional trio visits Stennis Space Center

U.S. Sen. David Vitter, R-La. (front row, fifth from left) stands with Rep. Steve Scalise, R-La. Dist. 1 (to his right) and U.S. Sen. Roger Wicker, R-Miss. (to his left) during a Dec. 16 meeting at Stennis Space Center. They came to Stennis for the second meeting of the Stennis-Michoud Aerospace Corridor Alliance. The purpose of this initiative is to address infrastructure, workforce and other needs of the area to make the corridor more attractive as a national center of excellence in aerospace and related industries. Others in the photo represent key Mississippi and Louisiana economic development officials, large aerospace company CEOs, small company representatives, Partners for Stennis officers and NASA participants.

FULFILLING NASA'S EXPLORATION MISSION

Stennis upgrades liquid nitrogen pumps

Installing a new liquid nitrogen pump system at the high-pressure gas facility at NASA's John C. Stennis Space Center involved a number of mechanical and engineering challenges. It also came down to a matter of simple mathematics.

The mechanical and engineering challenges were clear. Engineers first had to find a viable, efficient upgrade for a set of existing pumps that had been installed 40 years earlier. The pumps still worked well enough to provide the needed flow of liquid nitrogen for Stennis rocket engine test operations, but after four decades, they worked with growing inefficiency, persistent maintenance demands and increasing propellant loss. In addition, with a new test stand under construction, liquid nitrogen demands figured to increase, taxing the aging pumps even more.

Engineers had known of the need to upgrade the pump system for years, but the funding and a viable replacement pump had not been available. Funding came following the damage caused by Hurricane Katrina in 2005. Stennis received grants to upgrade critical facilities and operation systems in an effort to soften the impact of another such natural disaster.

Oil industry technology provided the viable liquid nitrogen pump replacement. Stennis engineer Haynes Haselmaier identified a durable, heavy-duty pump used in the oil field, and NASA leaders worked through the Innovative Partnership Program to team up with the pump manufacturer to adapt the equipment to meet Stennis' needs.

However, identifying the pump replacement was just the beginning of the upgrade challenge. Now, Stennis engineers had to design the system to match the pump and configure the facility accordingly.

The effort was comprehensive. Hurricane Katrina had exposed a serious need for Stennis. Cut off from regular deliveries after the storm, Stennis came perilously close to running out of the liquid nitrogen needed to maintain proper test operation systems. Such an event would have necessitated a long – and extremely costly – cleanup and recertification process for the nitrogen system.

Thus, part of the mitigation work at the gas facility involved doubling the storage capacity. Additional vessels were moved onsite. Existing piping was improved; new slabs and vessel foundations were poured; a new housing structure was built; and a state-of-the-art computerized pump monitoring and control system was designed.

The project was done in record time through the hard work of virtually every craft shop and support group at Stennis, as well as very capable industry partners, says Haselmaier, manager of the liquid nitrogen pump project. What normally would have taken two years to accomplish took less than a year, he adds. Also, all the work was done without interrupting the daily function of the gas facility.

Last fall, when the replacement pump was started, it worked as desired – and even better. Indeed, a single pump matches the output of at least four of the older pumps while using less power with less mechanical strain and with much less propellant loss. And a daily pumping process that once took four pumps five hours to complete now takes one pump only about four hours. Also, whereas the original pump system was operating at only 60 percent or less efficiency, early data suggests the new pump efficiency is more than 90 percent.

Meanwhile, the computerized monitoring system is proving to be an amazing tool. It allows manual, remote or automatic operation of the

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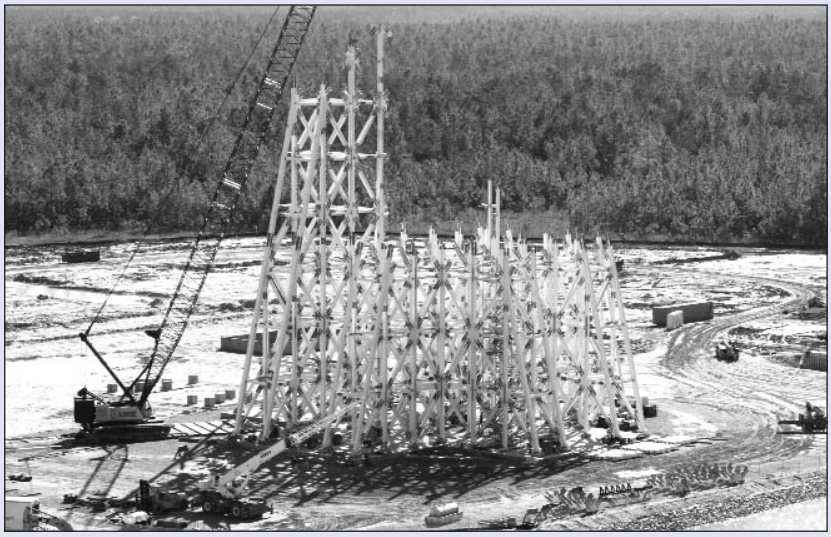

Steel continues to rise at A-3 Test Stand

Even during the holiday season, steel continued to rise at the A-3 Test Stand site at Stennis Space Center. Steel work on the stand, designed to test the new J-2X engine that will help carry humans back to the moon, is scheduled to continue through the spring of 2009.

Stennis testing high-tech mon

Engineers at NASA's John C. Stennis Space Center recently completed a second pilot demonstration that represents yet another step in development of a decidedly high-tech concept of systems monitoring for the American space program.

In addition, a third pilot demonstration is being prepared and work continues on implementing the Integrated System Health Management concept on the A-1 Test Stand at Stennis.

The concept is designed to offer engineers a high-tech, highly-integrative means of monitoring various systems that can:

- Detect anomalies in a system
- Diagnose causes
- Predict future anomalies
- Provide advice for improved operations
- Provide user interface that enables an integrated awareness of the health of the system.

The second pilot demonstration of the health management concept was conducted on the subscale diffuser test program at Stennis and produced good results, says Fernando Figueroa, an aerospace technologist at Stennis. That pilot demonstration followed one last spring when Stennis engineers traveled to Kennedy Space Center in Florida to offer colleagues there a glimpse of the Integrated System Health Management concept. The initial pilot implementation of the system focused on a liquid oxygen pump test. Kennedy observers reported "high satisfaction" with the results, Figueroa says.

Now, he and others involved in the project are preparing a third pilot demonstration for the chemical steam generator test program at Stennis. Meanwhile, implementation of the full Integrated System Health Management concept on the A-1 Test Stand should be complete by July 2009.

Figueroa came to the Mississippi facility in 2000 from Tulane University in New Orleans. He now leads a six-person team focused on developing the ISHM effort. Other team members include John Schmalzel of NASA, along with Jon Morris, Harvey Smith, Mark Turowski and Alexis Martin, all with Jacobs Technology.

Developing and implementing such an ISHM model to monitor a system will save time and money and reinforce the safety of a system, Figueroa predicts. "The idea is simple – the

High school rocket class led student t

The challenge of launching rockets in high school helped propel Justin Junell into an engineering career, and now, as an analysis engineer at NASA's John C. Stennis Space Center, he is helping astronauts launch into space.

As a junior at Fredericksburg High School in Texas, Junell joined a two-year Principles of Technology program. He and classmates designed, built and launched a rocket that was almost 5 feet tall. In his senior year, the goal was more challenging: a 22-foot-tall rocket they designed to reach an altitude of 100,000 feet. The rocket was launched through the donated use of facilities at the U.S. Army's White Sands Missile Range in New Mexico. "Launching rockets at White Sands is not something high school students typically do, but this wasn't your typical high school class," Junell says.

While the rocket fell shy of its desired altitude – it reached only 36,000 feet due to a nozzle failure – Junell says launching a rocket that size was exhilarating. "The rocket on the launch pad is the culmination of months of effort," he says. "Even getting to that point represents a degree of success."

Junell recently returned to help another class with a launch at White Sands and saw the same passion and perseverance in those students that he had as a teenager.

"It's the drive to succeed," he says. "When they went to launch their rocket, nothing happened. The students were discouraged, but right away, you could hear them troubleshooting. The students who go into a program like this aren't the kind that let setbacks get them down for long. Failure is definitely part of the learning process."

A high school propulsion class helped launch Justin Junell on a NASA career.

Junell had no inkling he would be launching rockets in high school, much less end up as an engineer, until he joined the Principles of Technology class at Fredericksburg High. He became enticed with the prospect of designing, building and launching rockets. By graduation, he was engineering-bound.

As a result of his involvement with the program, Junell received a scholarship to Kettering University in Michigan. In 2002, he began participating in a NASA cooperative education program that brought him to work in the Test Operations Group at Stennis. Since graduating with a bachelor's degree in applied physics, Junell has joined Stennis full-time as an analysis engineer in the Engineering & Test Directorate.

itoring system

more information you have, the better assessment you get of the health of your system and how safe it is."

This idea is to create a model and embed a wealth of information, strategies and knowledge about each and every component of a particular system into that model. Once in place, the model will allow ready access to information about the system and how it is functioning. Part of that process is devising a 3-D visualization interface that will allow engineers to follow system information more easily. "The goal is to store the data, information and knowledge so it can be accessed at the right time in the right context," Figueroa says.

The Stennis engineer agrees one can describe ISHM as troubleshooting before there's trouble. "But it also means that when there is trouble, you have a better idea where it is and what to do," he emphasizes.

Such a high-tech capability is a long-dreamed-of goal for NASA engineers intent on taking every step possible to ensure safety and efficiency in systems operations. Now, thanks to continuing work at Stennis Space Center, the dream is moving closer to becoming a reality.

to NASA career

As part of the Systems Analysis and Modeling group, Junell has contributed to evaluations of the J-2X power pack that supplies propellants to the J-2X engine that will power the upper stage of the Ares I rocket and the Earth departure stage of the Ares V rocket. Both rockets are key components of NASA's Constellation Program for going back to the moon. He also has contributed modeling and analysis support for testing of a chemical steam generator for Stennis' new A-3 Test Stand – a 300-foot rocket engine test stand under construction that will simulate altitudes of up to 100,000 feet.

Junell is also providing analysis for propulsion system acceptance testing for the AJ26 engine that will power the Taurus II space launch vehicle being developed by Orbital Sciences Corp. to support NASA.

Junell is thrilled about NASA's plans to go back to the moon. "It's an excellent time to work for NASA," he says. "As far as human spaceflight goes, we haven't traveled beyond low Earth orbit since the Apollo era. It's time to go beyond that."

Junell is also proud to be a part of the contributions Stennis will make toward NASA's future. "Walking around Stennis, one can see old test stands being updated and new ones being constructed that will test the engines to take us back to the moon," Junell says. "It is exciting to think that I am part of this, that I will be able to look back and say I was here at the beginning."

Haynes Haselmaier (left) points out details of the new liquid nitrogen pump system at the High Pressue Gas Facility at Stennis to Mak Kersanc. Haselmaier was manager of the pump project. Kersanc is project manager for center operations at Stennis and helped acquire funding for the new pumps.

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Continued from Page 3

system. What had been a largely hands-on process is now the opposite – and the system is providing an archive of invaluable monitoring information for engineers.

All of that is where the simple math comes into play. Although engineers plan to use comparative tests to determine the exact efficiency of the new system versus the old, the rough numbers already add up to a clear conclusion.

The new system will save Stennis a lot of money. Haselmaier calculates the savings already translate to about a truckload of liquid nitrogen a day. For a facility that purchases $2.7 million of liquid nitrogen a year, that savings alone is significant. However, one also must add in savings from lower power usage and decreased maintenance requirements. Engineers figure total savings will return the project's $3 million price tag in just a few years. "I have never been prouder of a project," Haselmaier says. "It was an extraordinary team effort."

John Pazos, mechanical lead for the project, agrees. "We're talking about more capacity, higher efficiency, state-of-the-art monitoring and data acquisition – all completed in record time," he says.

However, the work is not finished. Two more pumps have to be installed to bring the full upgraded system online. That work should be done by late 2009. When in place, the system will supply all existing needs as well as the future demands of the new A-3 Test Stand, being built to test the J-2X engine, which is in development. The J-2X will help power the Ares I and Ares V rockets that will take astronauts back to the moon as part of NASA's Constellation Program.

"By the time we complete this project, Stennis will have the most efficient permanent installation of this kind – certainly of this size – anywhere," Haselmeier concludes.

Stennis expands test facilities

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, NASA's John C. Stennis Space Center held a tree-cutting ceremony to initiate construction of a $40 million complex to test major components for the nation's next generation of rocket engines. The Jan. 18, 1989, event marked the beginning stages of the center's Component Test Facility.

Construction of the facility, known today as the E-1 Test Facility, covered 20 acres. "This is an exciting time for this place and for the nation," then-Stennis Center Director Roy Estess told employees at the site of the new complex. Estess said a very important feature of the new facility would be its flexibility to accommodate other potential propellants for future generations of rocket engines.

The versatile, three-stand complex includes seven separate test cells capable of testing that involves ultra high-pressure gases and high-pressure, super-cold fluids. These modern, state-of-the-art propulsion test facilities are designed for testing everything from developmental components to full-scale engines.

Subsequent to initial construction on the Component Test Facility, several other facilities were built in the same test complex, called E Complex. The High Heat Flux Test Facility, now known as the E-2 Cell 1 Test Facility, was constructed in 1993 to develop high temperature materials for the National Aerospace Plane program. In the mid-1990s, the E-3 Test Facility was constructed to test small-scale propulsion systems. In 1999, the E-2 Cell 2 Test Facility was constructed to test small rocket stages.

Former Stennis Space Center Director Jerry Hlass (left) and Gerald Pitalo cut down the first tree Jan. 18, 1989, to initiate construction of the $40 million Component Test Facility. At the time, Pitalo was NASA's chief of the Stennis CTF project office. Looking on during was Jerry Thomson, manager of the Advanced Propulsion Systems Office at NASA's Marshall Space Flight Center in Huntsville, Ala.

In May 2001, engineers began work on nearly $24 million worth of upgrades at the E Complex in May 2001. In August 2007, Stennis made preparations in the E Complex to conduct verification tests on A-3 Test Stand's altitude diffuser design Stennis continues to expand its rocket test capabilities with plans to provide propulsion system acceptance testing for the Taurus II space launch vehicle being developed by Orbital Sciences Corp. Stennis expects the first engine to be delivered in mid-2009.

Preparations under way for STS-119 mission

On Jan. 8, at NASA's Kennedy Space Center in Florida, space shuttle Discovery completed its journey from Orbiter Processing Facility-3 to the Vehicle Assembly Building. In ensuing days, the shuttle was hoisted vertically by a heavy-duty crane and joined with the solid rocket boosters and external fuel tank. The shuttle stack, perched on the crawler-transporter, was rolled out to the pad Jan. 14 – the next major milestone toward the beginning of the STS-119 mission. Discovery's STS-119 mission to the International Space Station is targeted for lift off Feb. 12 at 6:32 a.m. All the three main engines on the shuttle – visible in the above photo – were tested at Stennis Space Center.

A look back – 20 years of black history

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

In the history of the United States and African-Americans, 2008 and 2009 will stand as momentous years, years marking major anniversaries of the civil rights movement and the realization of those dreams at the highest level with Barack Obama's election as the first African-American president. Let's look back on the past 20 years at other events that left their mark in history:

1988 - 2008

• Ronald Brown is elected chair of the Democratic National Committee, becoming the first African-American to head one of the two major political parties.

• Frederick Gregory becomes the first African-American to command a space shuttle.

• Nelson Mandela is freed after 27 years in prison.

• Mississippi formally ratifies the 13th Amendment and abolishes slavery.

• Clarence Thomas takes his seat on the U.S. Supreme Court.

• Mae Jemison becomes the first African-American woman in space.

• Carol Braun of Illinois is the first black woman elected to the U.S. Senate.

• Louis Farrakhan organizes the Million Man March.

• 46,000 protesters rally in Columbia, S.C., to protest the Confederate battle flag flying atop the statehouse dome.

• President-elect George Bush announces the appointments of several African-Americans to his cabinet: Colin Powell, Condoleezza Rice and Roderick Page.

• Grutter v. Bollinger, an important affirmative action decision, rules that race can be one of the factors considered by colleges.

• Former Louisiana Gov. Edwin Edwards wins a landslide victory in his bid to return to office, defeating then-state Rep. David Duke, a former Ku Klux Klan leader.

• Samuel Bowers, a 73-year-old KKK leader, is convicted in Hattiesburg, Miss., of ordering a 1966 firebombing that killed a civil rights activist.

• 20,000 protesters travel to Jena, La., to demonstrate against what is considered harsh, inconsistent treatment of six black students.

In 1968, Democratic presidential candidate Robert F. Kennedy predicted an African-American could become president in 2008. "Things are moving so fast in race relations, a Negro could be president in 40 years. There is no question about it. In the next 40 years, a Negro can achieve the same position that my brother has; … prejudice exists and probably will continue to, … but we have tried to make progress, and we are making progress. We are not going to accept the status quo," Kennedy said May 27, 1968, about one week before he was assassinated.

Hail & Farewell

NASA bids farewell to the following:

Jean Ellis	IPA Project Directorate
Craig Peterson	IPA Project Directorate

@ Stennis

Do you think the space shuttle missions should be extended beyond their scheduled 2010 retirement date?

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

"Yes, obviously for economic reasons. The shuttle program is a vital part of the economy."

Barbara Ambrose, National Oceanic and Atmospheric Administration

"If there is funding available and it's beneficial to us on Earth, then, yes, extend them. But if funding is not available, no."

Mary Cutts, NASA

"In a word – yes. Basically, that would help us fill a gap in space travel and save us from having to look elsewhere for flights."

Joseph Grant, NASA

"I think they should be extended, if for no other reason than to continue the exploration. Space exploration is very important."

Robert Koller
Science Applications International Corp.

FIRST Robotics kicks off 2009 season

Twenty-seven teams from Mississippi, Louisiana and Florida high schools traveled to NASA's John C. Stennis Space Center on Jan. 3 for a rousing kickoff of the 2009 FIRST (For Inspiration and Recognition of Science and Technology) Robotics season.

During the event, team members, mentors and coaches watched a live broadcast from FIRST headquarters in Manchester, N.H., to learn their 2009 competition challenge. They also received parts kits to use in building robots to meet the challenge.

The FIRST Robotics Competition is designed to inspire students to pursue careers in engineering, science and technology. Each year, teams across the nation are given identical parts kits and just six weeks to build robots. The teams then use the robots to compete in regional events and a season-ending national tournament.

This year's "Lunacy" challenge commemorates the 40th anniversary of the 1969 moon landing. The competition will feature a playing field that simulates the low lunar gravity. Teams will score points by placing "moon rocks" in trailers pulled behind robots of opposing teams.

NASA and Stennis support FIRST Robotics Competition through mentors, volunteers and financial contributions. Last year, Stennis provided 25 mentors for local teams. This year, interested mentors should call Katie Wallace at 228-688-7744 or e-mail katie.v.wallace@nasa.gov.

The 2009 Bayou Regional FIRST Robotics Competition is scheduled at Lakefront Arena on the University of New Orleans campus March 19-21.

(Right photo) FIRST Robotics engineering mentors discuss design specifications for this year's robots.

(Bottom) Mentor Redmond Malone (second from left) and student Joseph McLaurin of Provine High School in Jackson, Miss., pick up a robotics parts kit from Stennis personnel.

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