The Marshall Star

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Marshall Director Scheuermann Presents Update to Area Leaders on Center's Economic Impact to Community and New Facilities

By Kenneth Kesner

NASA's Marshall Space Flight Center Director Patrick Scheuermann told community and business leaders, elected officials and other guests at the April 17 "Marshall 2014 Update" that everyone likes to talk about their work at the center. "It's exciting," Scheuermann said, to tell about programs and projects like the Space Launch System (SLS) that will make possible missions to capture and study an asteroid and, eventually, carry explorers to Mars.

He and other Marshall leaders spoke about the year of progress on SLS, which passed the important Preliminary Design Review; about the upgraded Payload Operations Integration Center at Marshall, and

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Live to Train and Train to Live: Active Shooter Exercise Prepares Marshall Center Employees For Emergency Actions

By Jena Rowe

"Exercise, Exercise, Exercise," was the message that rang through the Emergency Warning System's loud speakers on the morning of April 17 at NASA's Marshall Space Flight Center. The Marshall Protective Services Office of Emergency Management conducted a full-scale active shooter emergency exercise that tested the center's emergency response and preparedness actions.

*See **Active Shooter Exercise** on page 4*

Marshall Center Director Patrick Scheuermann, center, and emergency response team members discuss actions taken during the full-scale active shooter emergency exercise April 17. (NASA/MSFC/Fred Deaton)

NASA Completes LADEE Mission

NASA's Lunar Atmosphere and Dust Environment Explorer (LADEE) impacted the surface of the moon, as planned, April 17. NASA's Ames Research Center was responsible for managing the overall LADEE mission, including spacecraft design, development, testing and mission operations. NASA's Marshall Space Flight Center managed LADEE within the Lunar Quest Program Office.

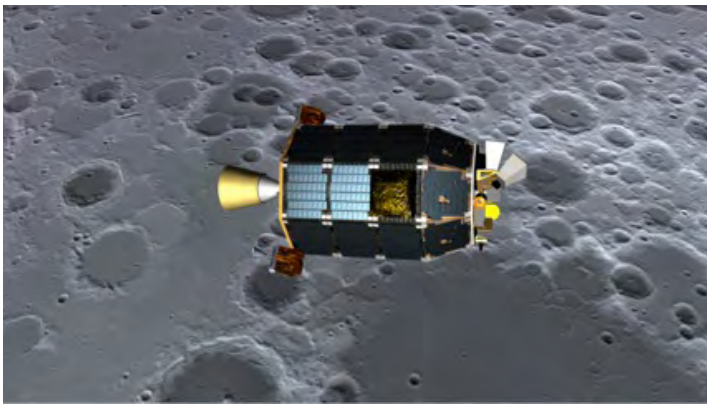
LADEE, launched in September 2013 from NASA's Wallops Flight Facility, began orbiting the moon Oct. 6., and gathering science data Nov. 10. The spacecraft entered its science orbit around the moon's equator Nov. 20, and in March 2014, LADEE extended its mission operations following a highly successful, 100-day primary science phase.

LADEE lacked fuel to maintain a long-term lunar orbit or continue science operations and was intentionally sent into the lunar surface. The spacecraft's orbit naturally decayed following the mission's final low-altitude science phase.

During impact, engineers believe the LADEE spacecraft, the size of a vending machine, broke apart, with most of the spacecraft's material heating up several hundred degrees -- or even vaporizing -- at the surface. Any material that remained is likely buried in shallow craters.

"At the time of impact, LADEE was traveling at a speed of 3,600 miles per hour -- about three times the speed of a high-powered rifle bullet," said Rick Elphic, LADEE project scientist at Ames. "There's nothing gentle about impact at these speeds -- it's just a question of whether LADEE made a localized craterlet on a hillside or scattered debris across a flat area. It will be interesting to see what kind of feature LADEE has created."
In addition to gathering detailed scientific information about the moon's atmosphere through several scientific instruments located on the spacecraft, LADEE also hosted a technology demonstration mission, the Lunar Laser Communication Demonstration.

The Lunar Laser Communication Demonstration was NASA's first dedicated system for two-way communication using laser instead of radio waves. It made history using a pulsed laser beam to transmit data over the 239,000 miles from the moon to Earth



An artist's concept of the LADEE spacecraft seen orbiting near the surface of the moon. (NASA Ames/Dana Berry)

at a record-breaking download rate of 622 megabits-per-second (Mbps). In addition, an error-free data upload rate of 20 Mbps was transmitted from the primary ground station in New Mexico to the Laser Communications Space Terminal aboard LADEE.

"These kinds of missions are not just important to developing new technologies we can use on future missions, they also for helping us understand more about our vast universe," said Joan Hannan, LADEE mission manager at the Marshall Center. "It's going to be very exciting to continue to see what we find out from LADEE as we continue to analyze the data over the coming months."

LADEE was a successful collaborative agency mission. In addition to Ames and Marshall, NASA's Science Mission Directorate funded the LADEE mission. NASA's Goddard Space Flight Center managed the science instruments, technology demonstration payload and science operations center, and provided mission support. NASA's Wallops Flight Facility was responsible for launch vehicle integration and launch services and operations.

For more information about the LADEE mission, visit here.

For more information about the Lunar Laser Communication Demonstration, visit here.

Marshall 2014 Update *Continued from page 1*

the growing amount of research managed aboard the International Space Station; about satellites, orbiting observatories and developing new technologies while expanding the frontiers of knowledge and advancing our understanding of Earth.

Scheuermann also presented an update about just where at Marshall that work is being done. Ground will soon be broken on two new test stands for the structural testing of hydrogen and oxygen tanks. And, in just a few weeks, a new facility -- Building 4220 -- will open on the Marshall campus. It will house SLS employees and other program and project offices. It is the seventh Leadership in Energy and Environmental Design or LEED-certified "green" building to be constructed at Marshall -- part of a nearly decade-long program to modernize aging center facilities and eliminate what is no longer needed.

When Building 4220 is occupied, the 50-year-old Building 4202 will be torn down and a modern, smaller building will take its place. Scheuermann said the "repair-by-replacement" strategy of moving into new, energy-efficient, environmentally friendly buildings will free up funding for programs while providing a healthier workplace.

"Our job is to be efficient on every front," Scheuermann said. "I want you to keep in mind that we are building the infrastructure to support space exploration for another 50 to 60 years."

Marshall Center Director Patrick Scheuermann and Dr. Lisa Watson-Morgan talk to news media at the April 17 Marshall 2014 Update. Watson-Morgan, the first woman to be named the center's chief engineer, answered questions about progress on the Space Launch System and other projects, and spoke about the importance of attracting young people to science, technology, engineering and mathematics education to maintain a "pipeline" of future engineers. (NASA/MSFC/Emmett Given)

The construction and improvements involve electricians, plumbers, heavy equipment operators and others not usually associated with rocket science and are another way in which Marshall contributes to the local economy.

The theme for this year's Marshall update, held at the U.S. Space & Rocket Center's Davidson Center for Space Exploration, was "Together We Make Bold Things Happen," and some numbers were presented

*See **Marshall 2014 Update** on page 8*

Sealed and Delivered

The adapter that will connect the Orion spacecraft to a Delta IV rocket for Orion's first flight test later this year is loaded onto a truck April 16 at NASA's Marshall Space Flight Center. The hardware -- designed and built at Marshall -- was delivered later that night to United Launch Alliance (ULA) in Decatur. From there, it will travel by ship to Cape Canaveral, Fla. ULA is constructing the Delta IV rocket for Orion's first flight. During the flight test, Orion will travel to an altitude of approximately 3,600 miles above Earth's surface before re-entering the atmosphere traveling approximately 20,000 mph at temperatures above 4,000 degrees Fahrenheit. The uncrewed flight will provide engineers with important data about Orion's heat shield and other elements, including the adapter's performance before it is flown in 2017 as part of the first SLS mission. (NASA/MSFC/ Brent Gaddes)

Active Shooter Exercise *Continued from page 1*

Although the shooting exercise was designed for training purposes, the scenario was very real. A designated gunman was recruited from the Army's Criminal Investigation Command Headquarters here on Redstone Arsenal to conduct the exercise by firing blank rounds from outside and inside Building 4494. Seven Marshall team members volunteered to be victims. Many participants reported the feeling of adrenaline racing when they heard the emergency messages and gunshots -- even though they had been notified prior to the training exercise.

"The exercise went extremely well," said Carole Valenti, emergency management director at Marshall. "We learned we have some things we need to work on -- which is the purpose of an exercise. We certainly want to find out those things during training before an event and not in a real situation."

The Marshall Uniformed Police were the first responders on scene, neutralizing the shooter and securing the incident scene. Redstone Arsenal Fire Department and the Huntsville Emergency Medical Services, Inc (HEMSI) also participated in the training, treating the staged victims, and ensuring continued safety as training operations continued.

"The shooter is really just a catalyst for us," said Valenti. "Our main objective was to see how well we would respond in this type of situation." After the exercise was completed and Marshall team members were given the "all clear," exercise participants held met to discuss lessons learned, challenges they faced, and if the training was helpful.

"The goal is to get everyone thinking about these types of situations because they involve more than just first responders," said Valenti. "It's about making sure people throughout the center know what to listen for and how to respond. Ultimately it's about taking care of each other."

So, how do you know what to do in an emergency situation such as an active shooter? The Emergency Operations Center (EOC) has resources that can help you answer that question. There's even an app for that!

Available electronically and in print, the Emergency Procedure Handbook is an easy-to-use employee desk guide with emergency information and contact numbers. Marshall team members can download the Emergency Procedures App for iOS and Android devices from https://apps.nasa.gov and a Web application is also available for desktop computers at https://em.msfc.nasa.gov/. Additional download instructions can be found here.

In the coming months, the EOC will implement an additional emergency notification service known as NIXLE. Using this service, Marshall team members will have the option to sign up for emergency messages to be sent directly to their mobile phones and email accounts from the EOC in real time.

"We believe everyone learned something from this exercise and everyone did what they were supposed to do," said Valenti. "I was very happy to see the participation by everyone at the center and that there is an overall understanding of the importance of this type of training."

In the coming weeks, the EOC will analyze actions that were taken during the active shooter exercise and plan for another more robust exercise in 2015. For more information about what to do in an emergency situation, visit the Emergency Management site on ExplorNet or call 544-3131.

Rowe, an ASRC Federal/Analytical Services employee and Marshall Star editor, supports the Office of Strategic Analysis & Communications.

Jay Onken Named Space Launch System Deputy Chief Engineer

Jay Onken has been named deputy chief engineer, Space Launch System (SLS). He has served as acting deputy since the reassignment of John Honeycutt to the position of deputy manager of the SLS program in November 2013.

In his new position, Onken plays a key role in leadership and execution of the program. Through delegation of the SLS chief engineer and the Marshall Space Flight Center chief engineer, he is responsible for leading overall engineering support to the SLS program. In a dual role, he serves as manager of the SLS Chief Engineer's Office with management oversight of SLS element chief engineers.

Onken has more than 24 years of extensive engineering and leadership/management experience in the design, development and operation of space transportation technologies and flight systems. After receiving a bachelor's degree in aeronautical and astronautical engineering from the University of Illinois in Champaign, he joined the Marshall Center in 1989 as an orbital analysis engineer conducting mission design analysis, producing flight products and supporting realtime operations for six Spacelab missions.

In September 1995, he was assigned to the Chandra X-ray Observatory program, where he led the planning and execution of the first end-to-end test between Chandra and the Mission Operations Laboratory-developed Operations Control Center in Cambridge, Mass. He then served as flight director for the observatory's activation and checkout period, including the on-orbit propulsive maneuvers performed by the observatory itself.

In July 1999, Onken was assigned as a Payload Operations Director for the International Space Station (ISS), where he directed ISS increments 3 and 4. He moved to Johnson Space Center in August 2001 to establish a resident office to facilitate daily coordination between Johnson's Mission Operations Directorate and the Marshall Mission Operations Laboratory. Returning to Marshall in September 2002, he assumed the position of deputy project manager for the ISS Payload Operations and Integration Function.

In October 2004, Onken was named deputy director of the Mission Operations Laboratory. He was appointed to the Senior Executive Service in 2008 as director of the Mission Operations Laboratory, where he served until his present assignment.

Jay Onken has been named deputy chief engineer, Space Launch System. (NASA/MSFC)

Onken has received numerous NASA awards and recognition throughout his career, including two NASA Medals for Exceptional Service, three NASA Certificates of Appreciation, a Johnson Center Flight Director's Award and numerous group achievement awards.

NASA Gears Up for Next Set of Engine Tests for Space Launch System

By Megan Davidson

The RS-25 engine that will power NASA's new rocket, the Space Launch System (SLS), off the launch pad and on journeys to an asteroid and Mars is getting ready for the test stand. And it is packing a big punch.

Engineers at NASA's Stennis Space Center are now focusing their attention on preparing the RS-25 engine after completing testing of the J-2X engine April 10. Four RS-25 engines, previously known as space shuttle main engines, will muscle the core stage of SLS for each of its missions. Towering more than 200 feet tall with a diameter of 27.6 feet, the core stage will store cryogenic liquid hydrogen and liquid oxygen that will feed the vehicle's RS-25s.

Modifications to the engines, like higher thrust levels, were needed on the proven workhorse to prepare them for the SLS. To accommodate a higher thrust level, the number of engines was increased from three, used during the shuttle era, to four. The power level also was increased for each engine.

Engines on the shuttle ran at 491,000 pounds vacuum thrust (104.5-percent of rated power level). After analyzing temperature and other factors on the engine, the power level was increased for SLS to 512,000 pounds vacuum thrust (109 percent of rated power level).

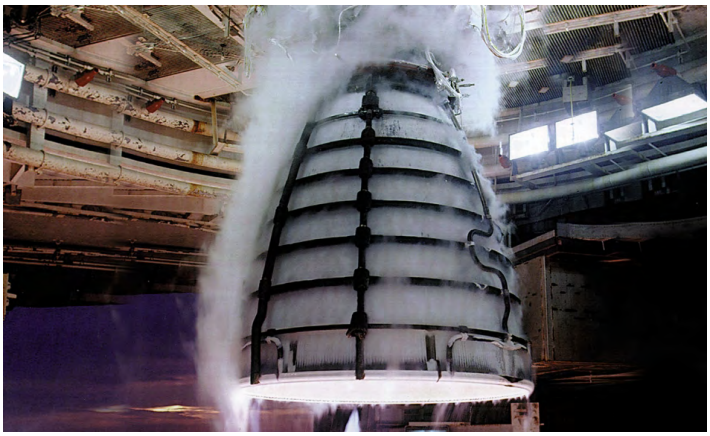
Modifications also have been made to the A-1 test stand at Stennis to prepare for the RS-25's first hot-fire test.

The completed J-2X test series provided many benefits as RS-25 enters the stand.

"From the start, testing of the J-2X engine progressed at an incredible pace and provided invaluable data," said Gary Benton, J-2X and RS-25 test project manager at Stennis. "We began J-2X powerpack testing for the engine in late 2007 and conducted a wide range of full-engine developmental tests since then. We have collected data on engine and test stand capabilities and performance that will benefit the nation's space program for years to come."

A number of J-2X test objectives offer benefits to the upcoming battery of RS-25 tests, including defining the performance, control and data characteristics of the test stand, and new processes used to record and interpret engine performance data.

Many of the modifications made on the A-1 test stand



Formerly known as the space shuttle main engine, the RS-25 accumulated more than 1 million seconds -- or almost 280 hours -- of hot fire experience during 135 missions and numerous related engine tests like the one pictured here. Four RS-25 engines will power the core stage of NASA's SLS and the engine will go back in the stand to begin testing this summer at the Stennis Space Center. (Aerojet Rocketdyne)

are based on improvements made throughout J-2X testing. For example, RS-25 thrust measurement, data collection, engine control system architecture and control of propellant conditions at the engine inlet all will be based on J-2X test experience.

Another strength the RS-25 test team will inherit is experience. The test crew and data review team have continually improved the efficiency of test operations leading up to RS-25 testing.

"We're gearing up for what we trust will be a successful and essential RS-25 test series -- technically as well as on cost and schedule -- and our J-2X experience directly contributes to this need," said Tom Byrd, deputy manager in the SLS Liquid Engines Office at NASA's Marshall Space Flight Center. The SLS Program is managed at the Marshall Center. "The manufacturing and testing we just completed will continue to be beneficial to the RS-25, the SLS Program and the agency's initiatives."

As future missions are defined for the 130-metric-ton vehicle -- the largest configuration planned -- NASA will consider various engine options that are the best value and design.

Watch the J-2X final test here. For more information on SLS, visit here.

Davidson, an ASRC Federal/Analytical Services employee, supports the Office of Strategic Analysis & Communications.

The Power to Conserve: Safety, Health and Environmental Day Activities Scheduled for April 30

By Bill Hubscher

Marshall Space Flight Center team members are invited to the annual Safety, Health and Environmental, or SHE, Day on April 30. The day's scheduled activities combine Marshall's Earth Day events with numerous SHE Day demonstrations and exhibits.

As a stand-down event, work will be suspended for non-essential services so Marshall team members can participate in SHE day events. Services such as fire fighters, security and cafeterias will continue as usual.

The day begins with a 1-mile fun walk at 8:30 a.m. on the Marshall walking trail behind the Wellness Center, Building 4315. A 5-kilometer run starts at 9 a.m. in front of the Wellness Center. The official ceremony to begin the day's activities also starts at 9 a.m. in front of Activities Building 4316 with a tree-planting ceremony.

Among the exhibitors and craft vendors, both inside and outside Building 4316, will be a variety of displays on energy conservation and safety. Team members are invited to visit SATERN to sign up for on-site training classes on cardiopulmonary resuscitation, or CPR.

SHE Day organizers also have created fun learning opportunities for attendees, using a game-show atmosphere featuring center leadership with "Marshall Squares" and "Marshall Family Feud" -- borrowing the format of "Hollywood Squares" and "Family Feud," respectively.

As in years past, free tree seedlings will be offered to attendees. Three special guests -- William McDonough, Brad Gardner and Steve Trash -- will speak on energy, safety and the environment. Lunch vendors will be on hand between 11 a.m. and 1 p.m.

Buses will be available to bring Marshall team members to the SHE Day activities. A complete schedule and details on the exhibits, speakers and classes can be found on the SHE Day ExplorNet site.

Hubscher, an ASRC Federal/Analytical Services employee, supports the Office of Strategic Analysis & Communications.

The Power to Conserve: Safety, Health and Environmental Day Activities Scheduled for April 30

NASA's first Human Exploration Rover Challenge -- a student design challenge that evolved from the annual Great Moonbuggy Race -- is featured in the latest edition of "This Week @NASA," a weekly video program broadcast nationwide on NASA-TV and posted online.

More than 70 high school and college teams from around the world raced on the half-mile course at the U.S. Space & Rocket Center. Prizes were awarded in numerous categories. The first-place winners were the Academy for Arts, Careers & Technology in Reno, Nev., in the high school division; and the University of Puerto Rico at Humacao in the collegiate division. For a complete list of awards, rules and replays of the entire event, organized by the Marshall Space Flight Center's Academic Affairs Office, visit the Rover Challenge

website. You can watch this and previous episodes of This Week @NASA at the NASA-TV YouTube channel.

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from a recent Marshall-commissioned economic impact study by the University of Illinois at Chicago that highlights the center's partnership with the region:

- One job at Marshall creates seven in Alabama.
- There are about 6,000 Marshall employees, including contractors and 2,700 government employees. The center is the third largest employer in the Huntsville metropolitan area.
- Marshall activity generates more than 14,000 jobs in Madison County and $1.1 billion in income; it generates 20,000 jobs across Alabama and 40,000 nationally.
- With $1.2 billion in contracts sourced within the Madison County, Marshall's total impact in the county is $2.5 billion annually.

In three of the last five years, the Marshall Center has won the NASA Administrator's Cup for the Best Small Business Program in all of NASA. Scheuermann said that's one symbol of how serious Marshall is about working with both small and large businesses, and how important they are to the center's success.

"When you succeed, we succeed," he said.

During the update, three companies were presented awards for their performance in fiscal year 2013:

- Teledyne Brown Engineering of Huntsville was named Large Business Prime Contractor of the Year.

During the Marshall 2014 Update, three companies were presented awards for their fiscal year 2013 performance. From left, Tim McKechnie, president of Plasma Processes, and his wife Cherie received the Marshall Center Small Business Subcontractor of the Year award; Ron Nyberg, program manager with Dynetics Technical Services, received the Small Business Prime Contractor of the Year award; and Dr. John Horack, vice president of Teledyne Brown Engineering, received the Large Business Prime Contractor of the Year award. (NASA/MSFC/ Emmett Given)

- Dynetics Technical Services of Huntsville was named Small Business Prime Contractor of the Year.
- Plasma Processes of Huntsville was named Small Business Subcontractor of the Year.

Kesner, an ASRC Federal/Analytical Services employee, supports the Office of Strategic Analysis & Communications.

Obituaries

William H. Tippins, 86, of Huntsville, died April 4. He retired from the Marshall Center in 1981 as a quality assurance specialist. He is survived by his wife, Doris Tippins.

Elbert Cecil Campbell, 88, of Trenton, died April 11. He retired from the Marshall Center in 1987 as an employee development specialist.

Suzanne "Susie" Elizabeth Perry, 60, of Huntsville, died April 11. She retired from the Marshall Center in 2014 as a budget analyst.

Joe William Sims, 73, of Hartselle, died April 19. He retired from the Marshall Center in 1997 as an aerospace engineer. He is survived by his wife, Susan Mary Puckett Sims.