July/August 2011

NNSA

National Nuclear Security Administration Monthly News

NEW MEXICO WILDFIRE: NNSA Administrator Tom D'Agostino (left) and Los Alamos National Laboratory (LANL) Director Charles McMillan (right) receive an update during the Las Conchas fire in Los Alamos, N.M. – the largest wildfire in the state’s history. The lab reopened July 6, 2011, after being closed for over a week. As of the end of July, the fire is nearly 100 percent contained and no essential LANL buildings were threatened.

In This Issue

www.facebook.com/NNSANews
www.twitter.com/NNSANews
www.youtube.com/NNSANews
www.flickr.com/NNSANews

Brad Peterson Brings Extensive Safety, Security Experience to OST

When Brad Peterson was asked to join NNSA's Office of Secure Transportation (OST), NNSA Administrator Tom D'Agostino knew Peterson’s extensive safety and security experience would benefit the organization that is responsible for the safe and secure transport of special nuclear materials.

Peterson, who served as NNSA's security chief for the past three years, is now the principal deputy assistant deputy administrator for OST. In this position, he joins Jeff Harrell, assistant deputy administrator for Secure Transportation, in directing OST's agent operations at Eastern Command, Central Command, and Western Command, training and logistics at Fort Chaffee, and staff operations in Albuquerque and Washington, D.C.

"One of my first goals is to learn the operations of OST," said Peterson. "OST is a complex organization with nearly 650 employees – of which 370 are federal agents – working across the country. I am able to bring what I have learned from the various sites and previous positions and apply it to OST."

In a memo to all employees, D'Agostino praised Peterson's commitment to NNSA and praised his achievements for his direction and management of NNSA's security programs throughout the enterprise.

"Brad has been the driving force in our efforts to reengineer the nuclear security program within NNSA," said D'Agostino. "We thank him for his visionary leadership and exceptional service and appreciate his willingness to take on this new and challenging assignment within NNSA."

D'Agostino said Peterson's focus on identifying and implementing fundamental

(continued on page 2)

Administrator's Corner

With the heat breaking, kids going back to school, and summer coming to an end, I hope you've had an opportunity to take a break and spend some time with your friends and family. As proud as I am of how hard everyone at NNSA works, it's important that we all find the time to step back, relax, and recharge.

Last month, I traveled to France and the United Kingdom to talk with others about the future of nuclear security across the globe. It was a valuable and rewarding experience – there are smart people working to solve many of the same problems we work to solve every day, and it's always interesting to see how others approach them. Our technical collaboration efforts have led to significant breakthroughs in science and engineering in the past, and I was encouraged by what future efforts will yield.

I also recently had the opportunity to talk with the next generation of nuclear security experts in our Future Leaders Program. One of the most important things we're doing is investing in the future of our nuclear security enterprise, and it will be up to them to build on the work we're doing today. They're an immensely talented group of people, and I'm confident that their ideas and ambition will help keep NNSA the amazing organization it is for years to come. It was inspiring answering their questions and listening to stories.

As we head toward fall, please know how much I appreciate what you do. The dedication and commitment I see across NNSA are a constant source of pride for me, and all of you have my sincere thanks.

Tom D'Agostino

NNSA AT THE BALLPARK: NNSA Principal Deputy Administrator Neile Miller, NNSA Administrator Tom D'Agostino, and Principal Deputy Assistant Secretary for Environmental Management Tracy Mustin joined more than 100 NNSA employees recently at the 3rd annual "NNSA Day at the Ballpark."

Brad Peterson Brings Extensive Safety, Security Experience to OST

(continued from page 1)

security reforms resulted in the development of new peer review approaches and the implementation of deliberate and defendable processes to assess the threat, evaluate plausible scenarios, and create strategies to ensure the security of the nation's most sensitive nuclear assets.

These efforts, led by Peterson, resulted in new corporate security processes that provide for cost effective protection of nuclear weapons, special nuclear materials, sensitive and classified information, facilities, and employees. As a result, NNSA has reduced its physical security budget by 10 percent per year since fiscal year 2008 ($80 million/year), while maintaining a robust security posture against the full spectrum of current threats.

Additionally, other NNSA programs are also realizing millions of dollars in efficiencies resulting from these security reforms.

In addition, Peterson's move is consistent with NNSA's organizational philosophy of rotating senior executives among organizations and geographic locations where possible to promote better integration within NNSA.

Prior to his tenure at NNSA, Peterson served as the director of the office of independent oversight within the Office of Health, Safety, and Security. He also served as the director of the Office of Cyber Security Evaluations within the Office of Independent Oversight. He is a United States Naval Academy graduate and was on active duty in the United States Navy for nine years.

U.S., Russia Reaffirm Commitment to Dispose of Surplus Weapons-grade Plutonium

After an exchange of diplomatic notes on July 13 by Secretary of State Hillary Clinton and Russian Foreign Minister Sergey Lavrov at the State Department, the amended Plutonium Management and Disposition Agreement (PMDA) formally entered into force. The United States and Russia reaffirmed their commitment to dispose of no less than 34 metric tons each of their surplus weapons-grade plutonium by irradiating the plutonium as mixed oxide (MOX) fuel in nuclear power reactors. The material to be disposed under the Agreement is enough for approximately 17,000 nuclear weapons.

Over the last year, the amended PMDA has been provisionally applied by the U.S. and Russian governments and has now been ratified by action of the Russian Duma and by Russian President Dmitri Medvedev's approval on June 3, 2011. By exchanging diplomatic notes, the two countries brought the Agreement into full effect.

To implement U.S. plutonium disposition, NNSA is overseeing the construction of three major facilities at the Savannah River Site: the MOX Fuel Fabrication Facility; the Waste Solidification Building; and a pit disassembly and conversion capability. At the same time, Russia is making significant investments in its MOX fuel fabrication capabilities and construction of the BN-800 fast reactor (both currently scheduled to become operational in 2014). Under the amended PMDA, both countries will begin disposition in 2018.

REAFFIRMING COMMITMENT: Secretary of State Hillary Clinton and Russian Foreign Minister Sergey Lavrov at the State Department exchange diplomatic notes during the formal entry into force of the amended Plutonium Management and Disposition Agreement.

FEDS FEED FAMILIES: Employees across the enterprise have been participating in the annual Feds Feed Families. As part of the Feds Feed Families campaign, DOE's goal is to collect 132,000 pounds of non-perishable items by Aug. 31.

DOE Associate Deputy Secretary Admiral Melvin G. Williams personally pledged one ton of food during the kick off to the third Fed's Feed Families campaign.

NNSA News is published monthly by the Office of External Affairs.
EDITORS: *Josh McConaha, Robert Middaugh, Michael Padilla, Al Stotts.*
ASSISTANT EDITOR AND DESIGN: *Barbara L. Courtney* **CONTRIBUTORS:** *Lisa M. Frerichs*

NNSA Conference Highlights Work Critical to Stewardship Science

Stewardship Science Graduate Fellowship Program Welcomes Sixth Class

Students involved in the Department of Energy NNSA Stewardship Science Graduate Fellowship (SSGF) program recently showcased their work at the annual fellows' conference in Arlington, Va. The students take part in advancing the understanding of areas important to stewardship science including high energy density physics, nuclear science, and materials under extreme conditions and hydrodynamics.

The conference welcomed the sixth class of new fellows. Participants had the opportunity to listen to talks by Ph.D. candidates and view posters on current research by first- through third-year fellows.

"Investing in the complex science and engineering disciplines that are critical to stewardship science is a top priority for NNSA," said Don Cook, NNSA's deputy administrator for Defense Programs. "The Stewardship Science Graduate Fellowship program is important as we continue to engage outstanding graduate students to ensure that NNSA is recruiting the next generation of nuclear security professionals."

Funded by NNSA and founded in 2006, the SSGF program is administered by the Krell Institute. The SSGF recognizes an ever-increasing demand for scientists highly-trained in areas of interest in fields of complex science and engineering that are critical to stewardship science.

Students selected for this fellowship possess a strong academic background in a scientific or engineering discipline. The program provides them up to four years of support while pursuing a doctoral degree in one of three major areas: materials under extreme conditions and hydrodynamics, high-energy density physics, or nuclear science. Each student performs a research assignment (minimum of 12 weeks) at a DOE laboratory. These fellowships and the laboratory experience have led to a large percentage of program alumni joining a DOE laboratory as research staff members.

SHOWCASING STEWARDSHIP SCIENCE: DOE NNSA Stewardship Science Graduate fellow, Joshua Renner, presents his poster to judge Charlotte Elster of Ohio University.

> *"The Stewardship Science Graduate Fellowship program is important as we continue to engage outstanding graduate students to ensure that NNSA is recruiting the next generation of nuclear security professionals."*
>
> Don Cook
> NNSA Deputy Administrator
> for Defense Programs

DOE NNSA Stewardship Science Graduate Fellowship awardees for the 2011-2012 academic year are:

Adam Cahill, plasma physics Ph.D. candidate at Cornell University

John Gibbs, materials science Ph.D. candidate at Northwestern University

Geoffrey Main, computational mathematics and engineering Ph.D. candidate at Stanford University

Walter Pettus, experimental nuclear and particle physics Ph.D. candidate at University of Wisconsin-Madison

Jennifer Shusterman, nuclear chemistry Ph.D. candidate at University of California, Berkeley

Christopher Young, plasma physics/ thermosciences Ph.D. candidate at Stanford University

NEXT GENERATION LEADERS: NNSA Defense Programs Program Manager Keith LeChien (above left) spoke about the importance of the DOE NNSA Stewardship Science Graduate Fellowship Program at the annual conference.

DOE NNSA Stewardship Science Graduate Fellowship Program Goals

- **Ensure a continuous supply of highly trained scientists and engineers in areas of study related to high energy density physics, nuclear science and materials under extreme conditions and hydrodynamics**
- **Provide opportunities for DOE NNSA SSGF fellows to do research at DOE defense laboratories**
- **Bring together a national meeting of fellows, university faculty and laboratory scientists to share research advancements**
- **Create opportunities for fellows to work with some of the nation's most sophisticated and powerful experimental and computational facilities**
- **Make graduating fellows aware of employment opportunities within the Department of Energy and its system of laboratories**
- **Build the next generation of leaders with expertise in stewardship science in support of national defense**

CREATING OPPORTUNITIES: Paul Miller and Cynthia Nitta of Lawrence Livermore National Laboratory discuss practicum and employment opportunities with a group of DOE NNSA SSGF fellows.

The Science of Nuclear Security

NNSA System Installed on International Space Station Shows Promising Future for Space-based Nonproliferation Technology

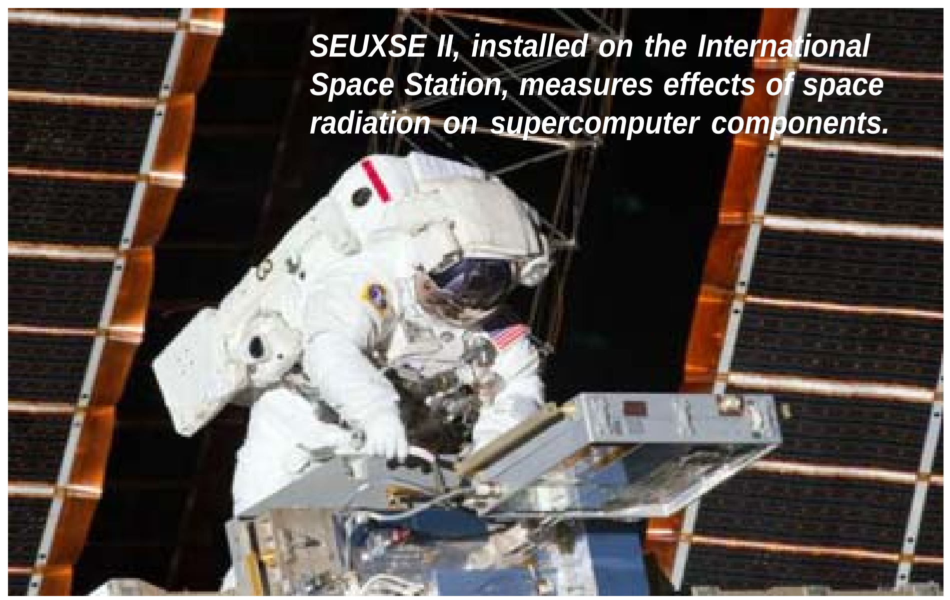
The test results we've seen from SEUXSE II are critical to developing the kind of technologies we need to prevent nuclear proliferation.

Anne Harrington
NNSA Deputy Administrator for Defense Nuclear Nonproliferation

NNSA recently announced that test results show its second Single Event Upset Xilinx-Sandia Experiment (SEUXSE II - pronounced "Suzie Two") package is resistant to a severe space radiation environment, providing a revolutionary level of performance, reduced costs, and greater flexibility for NNSA's treaty monitoring mission.

SEUXSE II is a second generation experiment that has enabled NNSA's Office of Nuclear Nonproliferation and Verification Research and Development, through the use of expertise at NNSA's Sandia National Laboratories, to investigate the effects of space radiation on commercial-off-the-shelf (COTS) supercomputer components for possible use in space-based treaty monitoring technology.

"The test results we've seen from SEUXSE II are critical to developing the kind of technologies we need to prevent nuclear proliferation," said NNSA Deputy Administrator for Defense Nuclear Nonproliferation Anne Harrington. "This research is a vital investment in our ability to detect, localize, and analyze the global proliferation of weapons of mass destruction and ensure treaty compliance in the future."



SEUXSE II, installed on the International Space Station, measures effects of space radiation on supercomputer components.

Materials International Space Station Experiment-8 (MISSE-8), which includes SEUXSE II, was launched on NASA's space shuttle Endeavour on May 16, 2011. NASA astronauts installed MISSE-8 on the outside of the International Space Station (ISS) on May 20, 2011, and SEUXSE II became operational one week later.

The new SEUXSE II experiment replaced the SEUXSE I, which operated successfully for one and a half years on the ISS to detect and characterize single event upsets caused by cosmic rays in the radiation tolerant Virtex-4 Field Programmable Gate Array (FPGA). The experiment is the first space flight of industrial partner Xilinx's latest radiation-hardened, on-orbit reconfigurable FPGA, the Virtex-5.

Using the unique facilities and scientific skills of NNSA and Department of Energy national laboratories, and in partnership with industry and academia, NNSA's Office of Nuclear Nonproliferation and Verification Research and Development efforts provide the technical base for national and homeland security agencies to meet their nonproliferation, counterproliferation, and counterterrorism responsibilities.

NNSA Rolls Out Mobile Radiation Detection System for INTERPOL Members

In May, representatives from more than 60 countries got an up-close-and-personal view of NNSA's high-tech van for detecting nuclear and radiological threats. The participants were attending a conference in Lyon, France, on preventing global radiological and nuclear terrorism, hosted by INTERPOL, the International Criminal Police Organization.

INTERPOL's invitation for NNSA's Office of Second Line of Defense (SLD) to display its mobile detection system (MDS) was timed to coincide with the launch of INTERPOL's Radiological and Nuclear Terrorism Prevention Unit. The invitation also served as recognition that NNSA-deployed radiation detection technology, such as the MDS, strengthens the capacity of the worldwide law enforcement community to prevent the malicious use of radiological and nuclear materials, a principal objective of INTERPOL Unit.

Eight countries now use the NNSA mobile detection equipment to complement fixed systems such as vehicle, pedestrian and rail portals at border crossings, seaports and airports.

"The mobile detection system is among the tools that NNSA makes available to partner countries to detect, deter, and interdict illicit trafficking of nuclear and other radioactive materials," said John Gerrard, assistant deputy administrator for International Material Protection and Cooperation. In addition to the vans, SLD provides other portable radiation detection equipment, including backpacks and handheld devices, along with the associated training and maintenance support necessary for sustained operations. Significant support for this mobile detection work has been provided by PNNL.

Eight countries now use the NNSA mobile detection equipment to complement fixed systems such as vehicle, pedestrian and rail portals at border crossings, seaports and airports. "With the mobile systems, officials can operate between official points of entry or move quickly to a site of interest in response to specific information alerts, said Erik

(continued on page 8)

NNSA's BlueGene/Q Ranked as Most Energy-efficient Supercomputer

NNSA's BlueGene/Q, which will be deployed at Lawrence Livermore National Laboratory (LLNL) in 2012 as Sequoia, has been listed on the bi-annual Green500 list as the world's most efficient supercomputer. In addition, two supercomputers in the top 20 are housed at Los Alamos National Laboratory (LANL) and 16 other computer systems housed at LLNL, LANL and Sandia are also ranked in the most recent Green500 list.

"Energy efficiency is vital to NNSA as we continue to build a modern infrastructure that is smaller, safer, more cost effective and more programmatically effective," said Don Cook, NNSA's deputy administrator for Defense Programs. "I am proud of the work done by the men and women who work in NNSA's Advanced Simulation and Computing Program, and I applaud their commitment to promoting energy awareness while being effective stewards of taxpayer dollars."

As part of NNSA's mission to ensure the safety, security and reliability of the nation's nuclear deterrent, the Advanced Simulation and Computing (ASC) Program provides NNSA with leading-edge, high-end simulation capabilities through supercomputing.

NNSA's ability to model the extraordinary complexity of nuclear weapons systems is central to U.S. national security and essential to establish confidence in the performance of our aging stockpile without additional testing.

The Green500 has been compiled since 2005 by computer scientists and engineers at Virginia Tech to emphasize energy efficiency as an important component of supercomputing performance, in addition to speed as measured in floating point operations per second.

NNSA Monitors Major League Baseball's All-Star Game

While people were watching the recent Major League Baseball (MLB) All-Star game, a team of experts from the NNSA were supporting the overall conduct of preventative radiological/nuclear detection (PRND) at Chase Field in Phoenix, Ariz.

Over a six-day period, NNSA provided personnel and equipment resources to enhance security measures at the game.

"NNSA is well equipped to help enhance radiological/nuclear security at major events like the All-Star game," said Joseph J. Krol, associate administrator for the Office of Emergency Operations. "Monitoring the game is part of NNSA's mission to protect the public, environment, and emergency responders from both terrorist and non-terrorist events. NNSA is fortunate to have an efficient and effective radiological emergency response team to keep the public safe, especially at large gatherings."

The PRND operations include support personnel from NNSA's Radiological Assistance Program, the FBI Hazardous Materials Response Team, Maricopa County Sheriff's Office, and the Phoenix Fire and Police Departments.

NNSA teams are deployed more than 100 times a year, mainly within the U.S., and most are radiological search deployments. The deployments are based on intelligence, support of law enforcement, or planned events such as the MLB's All-Star game, presidential inaugurations or political conventions.

NNSA Rolls Out Mobile Radiation Detection System

(continued from page 7)

Deschler, SLD's project manager for the systems. "You can set up temporary and self-contained radiation detection stations beside roadways, at large public venues, and other locations where fixed equipment is not practical. For some applications the mobile detection system can be used to search parking lots, entry points for buildings, and vehicles in a variety of locations, quickly detecting nuclear and radiological material that could indicate a threat."

"This event gave us a global stage to share the mobile detection system utility with law enforcement decision-makers worldwide, including cabinet-level officials responsible for security, counter-terrorism, and forensics," Deschler said. "We were especially pleased that, as a result of this conference, representatives from 17 countries expressed interest in attending a prospective users' workshop this fall, paving the way for deployment in more countries."

NNSA Conducts Several Successful JTA Flight Tests

NNSA, working with the U.S. Air Force, recently conducted two successful W80 Joint Test Assembly (JTA) flight tests and one W78 JTA flight test. The joint flight testing program helps ensure the safety, security and effectiveness of the U.S. nuclear weapon stockpile.

During the two separate W80 JTA flight tests missions at the Utah Test and Training Range outside of Salt Lake City, Utah, the Air Force successfully launched an Air Launched Cruise Missile (ALCM) carrying a JTA. A B52-H originating from Minot Air Force Base, N.D., launched both of the ALCMs.

As for the W78 JTA, the Minuteman payload consisted of a single instrumented JTA launched from Vandenberg Air Force Base. It was the first flight test incorporating a new command destruct system, Command Receiver Decoder, developed for the Minuteman program.

"JTA flight tests are essential in ensuring that all weapon systems perform as designed," said Brig. Gen. Sandra Finan, NNSA principal assistant deputy administrator for Military Application. "The working relationship between NNSA and the Department of Defense is vital as we continue our strong partnership in support of our national security."

NNSA produces JTAs in support of the Joint Surveillance Flight Test Program between the Department of Defense and the NNSA. A JTA contains a set of sensors and hardware used during flight tests to ensure that weapons perform as intended. JTAs are built to simulate actual weapon configurations utilizing as much war reserve hardware as feasible. JTAs are not capable of nuclear yield, as they contain no special nuclear materials.