April 2009

NNSA Monthly News

NNSA Completes Construction of Largest Laser

Earlier this month, NNSA certified completion of the historic effort to build the world's largest laser. Housed at the agency's Lawrence Livermore National Laboratory, the National Ignition Facility (NIF) is expected to allow scientists to achieve fusion ignition in the laboratory, obtaining more energy from the target than is provided by the laser. The completion of NIF opens the door to scientific advancement and discovery that promises to enhance our national security, could help break America's dependence on foreign oil, and will lead to new breakthroughs in the worlds of astrophysics, materials science and many other scientific disciplines.

"Completion of the National Ignition Facility is a true milestone that will make America safer and

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In This Issue

NEW MEXICO LABS VISIT: Energy Secretary Steven Chu (center) listens to a briefing at the Microsystems and Engineering Sciences Applications Microelectronics Laboratory at Sandia National Laboratories/New Mexico (SNL). To his right is SNL Director Tom Hunter. On the Secretary's left are U.S. Senator Jeff Bingaman (D-NM) and Albuquerque, N.M. Mayor Martin Chavez. Chu's first stop in New Mexico was Los Alamos National Laboratory where he received a classified tour focused on the lab's nuclear weapons program. At SNL he gave a talk to lab employees that outlined the critical role the three NNSA laboratories will play in advancing the nuclear security agenda outlined by President Obama as well as the important contributions they make in addressing broad national challenges like energy security, climate change and economic development.

NNSA Non-proliferation Work Supports Goals of U.S.-Russian Joint Statement

On April 1, President Barack Obama and Russian President Dmitriy Medvedev of the Russian Federation issued a Joint Statement on strategic arms reductions in which the two countries pledged to fulfill obligations of the two nations under Article VI of the Treaty on Non-Proliferation of Nuclear Weapons and demonstrate leadership in reducing the number of nuclear weapons in the world.

"We committed our two countries to achieving a nuclear free world, while recognizing that this long-term goal will require a new emphasis on arms control and conflict resolution measures, and their full implementation by all concerned nations," the statement said. "We

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NNSA Non-proliferation Work Supports Goals of U.S.-Russian Joint Statement

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agreed to pursue new and verifiable reductions in our strategic offensive arsenals in a step-by-step process, beginning by replacing the Strategic Arms Reduction Treaty with a new, legally-binding treaty. We are instructing our negotiators to start talks immediately on this new treaty and to report on results achieved in working out the new agreement by July."

The joint statement also addressed a variety of nuclear nonproliferation and global threat reduction initiatives, including many that intersect with NNSA programs. The following are excerpts from the joint statement along with links to fact sheets about NNSA's ongoing Defense Nuclear Nonproliferation work, the Global Threat Reduction Initiative, the Next Generation Safeguards Initiative, and the agency's efforts to prevent nuclear terrorism:

EXCERPTS FROM JOINT STATEMENT:

"Together, we seek to secure nuclear weapons and materials, while promoting the safe use of nuclear energy for peaceful purposes."
See NNSA Defense Nuclear Nonproliferation Work: http://www.nnsa. energy. gov/nuclear_nonproliferation/print/index.htm

"We support the activities of the International Atomic Energy Agency and stress the importance of the IAEA Safeguards system. We seek universal adherence to IAEA comprehensive safeguards, as provided for in Article III of the NPT, and to the Additional Protocol and urge the ratification and implementation of these agreements."
See NNSA Next Generation Safeguards Initiative: http://www.nnsa. energy.gov/news/2119.htm

"We will deepen cooperation to combat nuclear terrorism. We will seek to further promote the Global Initiative to Combat Nuclear Terrorism, which now unites 75 countries. We also support international negotiations for a verifiable treaty to end the production of fissile materials for nuclear weapons."
See NNSA Preventing Nuclear Terrorism: http:// www.nnsa. energy.gov/news/982.htm

NNSA Completes Construction of Largest Laser

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more energy independent by opening new avenues of scientific advancement and discovery," said NNSA Administrator Thomas D'Agostino. "NIF will be a cornerstone of a critical national security mission, ensuring the continuing reliability of the U.S. nuclear stockpile without underground nuclear testing, while also providing a path to explore the frontiers of basic science, and potential technologies for energy independence."
NIF is a critical part of NNSA's mission of

"NIF has the ability to deliver large amounts of energy with extreme precision in billionths of

maintaining the safety and reliability of our nuclear deterrent without conducting nuclear testing. The United States has not deployed a new nuclear weapon in over 20 years, nor conducted an underground nuclear test since 1992. Instead, scientists at the NNSA maintain the warheads in the stockpile well beyond their original life by using sophisticated supercomputers and facilities that test the safety, security and reliability of U.S. weapons in NNSA laboratories.

With NIF, scientists will be able to evaluate key scientific assumptions in current computer models, obtain previously unavailable data on how materials behave at temperatures and pressures like those in the center of a star, and help validate NNSA's supercomputer simulations by comparing computer code predictions against observations from laboratory experiments.

Because of its groundbreaking advance in technology, NIF also has the potential to produce breakthroughs in fields beyond national security. It may also help advance fusion energy technology, which could be an element of making the United States energy independent.

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NNSA, U. of Pennsylvania and Philadelphia Police Raise the Bar for Radiological Security

The NNSA recognized the University of Pennsylvania and the city of Philadelphia for their national security leadership during a nuclear security forum held in March. The day before the forum, NNSA and the Federal Bureau of Investigation hosted a tabletop exercise with federal, state and local officials at the University of Pennsylvania to exercise security alarm response and crisis/consequence management skills in response to a terrorist event.

NATIONAL SECURITY LEADERSHIP: NNSA Administrator Thomas D'Agostino recognizes the Philadelphia Police Department for their leadership and training in responding to radiological incidents. Pictured are Chief Inspector Counter Terrorism Joe Sullivan (left) and Lieutenant Edward Baldini (right).

"The University of Pennsylvania and its affiliated institutions are world leaders in education, research and medicine, and we are pleased to be recognizing them today as a world leader in national security," said NNSA Administrator Thomas D'Agostino. "NNSA's cooperation with the university and the city of Philadelphia is an example for hundreds of other sites and communities across the U.S. and the world that users of radiological materials can successfully balance the need for security without adversely impacting the benefits of their use."

The tabletop exercise and similar events are held routinely at both NNSA and Department of Energy sites and are an important tool in evaluating security and emergency response. NNSA has expanded the exercises to include civilian sites like the University of Pennsylvania to engage city and state officials who comprise the first responders in a national security event.

NNSA also recognized the University of Pennsylvania for completing all of the voluntary radiological security upgrades offered by NNSA's Global Threat Reduction Initiative and NNSA's federal partners. In partnership with the Nuclear Regulatory Commission (NRC) and the Department of Homeland Security, NNSA continues to install voluntary security upgrades at civilian sites in the United States to reduce the potential for theft or misuse of radiological materials that could be used in a dirty bomb. These voluntary upgrades are in addition to security enhancements required by the NRC and state governments since 2006.

"Penn is proud to be a national leader in medical care and ground-breaking research," said Craig Carnaroli, Penn executive vice president. "By partnering with the NNSA, we are securing our research labs in new ways while supporting our award-winning campus safety programs."

"Since taking office more than two years ago, I have focused on the grave threat posed by nuclear terrorism," said Pennsylvania U.S. Senator Robert Casey. "But we must also remain on guard against so-called dirty bombs -- attacks employing radiological materials to spread fear and panic, even if they may not kill many people. That's why I am so proud that the University of Pennsylvania, in cooperation with the city of Philadelphia, is the first in our country to complete voluntary security upgrades to ensure that radiological material is safe and secure. The people of Philadelphia are safer today, thanks to their foresight and will to action."

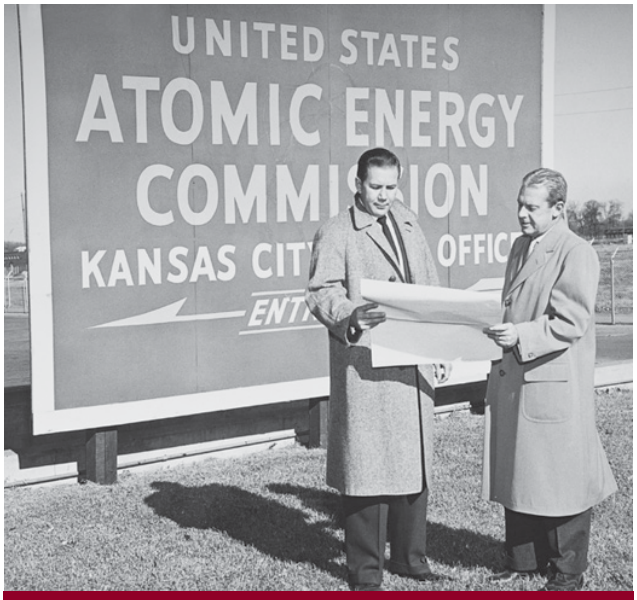
NNSA's Y-12 National Security Complex provided radiological security alarm response training to University of Pennsylvania and Philadelphia Police. Pacific Northwest National Laboratory worked with the university to implement the security enhancements, and Sandia National Laboratories installed retrofit plates on the irradiators which greatly increase the time to remove the cesium sources.

Kansas City Plant Serves 60 Years as National Security Asset

This year the NNSA's Kansas City Plant (KCP) celebrates 60 years of service to the national defense mission. While much has changed in the world in the past six decades, KCP's mission to deliver safe, high-quality products is still the same.

Quiet Start to Production

The Kansas City Plant became a reality in February 1949 when the Bendix Corporation quietly announced it had been selected by the Atomic Energy Commission to perform "certain operations, the exact details of which are classified." The employees guarded the nature of the mission so well that, for many years, the community assumed the plant made washing machines.



BIG PLANS FOR NATIONAL SECURITY: In 1949 the Atomic Energy Commission selected Kansas City as the location to begin the Kansas City Plant's mission to support the nuclear weapons stockpile.

The first employees were hired in March and were faced with the task of getting the former Navy aircraft engine plant ready for its new role. First on the checklist was the removal of tons of sugar and tires being stored at the facility by a former tenant. By April 19, three machines had been wired and were ready for operation.

Three short days later, on April 21, the plant's first part - an ordinary machined bushing - was produced. That simple part was the forerunner to the highly sophisticated and complicated components built in the years that followed.

From Semi-conductors to Semi-trailers

With each passing decade, the parts built at the plant became increasingly complex and critical to the safety, security and reliability of the stockpile. The first weapon components look low-tech compared to today's technological advances. The original parts relied heavily on aircraft technology vacuum tubes, large transformers, and bulky cables.

Today, the "factory" is now one the nation's most diverse low-volume, high-reliability production facilities. With product capabilities ranging from

AN UNUSUAL SOLUTION: In the early days, the facility experienced a shortage of steam to produce plant heating. Two locomotives were driven onsite and hooked up to plant steam lines.

semi-conductors to semi-trailers, the plant serves as the premier secure applied engineering and manufacturing center, producing more than 80 percent of NNSA's nonnuclear components.

HELP WANTED: KCP actively recruited engineers and highly skilled workers around the region to keep up with the growing business. By the end of 1949, employment stood at 1,240.

Commitments Made, Commitments Kept

The plant has never been a facility with normal or routine challenges. Out of necessity, the Kansas City Plant has become an innovator in continuous improvement, and with every challenge has adapted to consistently provide 99.9 percent on-time delivery performance with the highest levels of quality. Over 60,000 person-years of employee expertise in over 80 process technologies and over 30 product families provide the basis to support nearly any future stockpile scenario.

Its mission now includes providing other government agencies with national security products to help fight the war on terror. That pioneer spirit continues as the plant looks forward this year to breaking ground on a new modern facility that will allow them to serve the national security mission for many years to come.

Turning Science Into Reality

Taking a design, breathing life into it, and turning it into reality is what the Kansas City Plant is all about.

The plant is a multi-disciplinary scientific and engineering organization providing engineering solutions to complex problems such as ruggedized telemetry.

The plant's telemetry systems gather and transmit sensor-measured data during flight testing of missiles, bombs and artillery shells. Some of these units have been shot from cannons; others have been dropped from aircraft onto concrete. Given the nature of this work, the telemetry units are extremely rugged and can withstand high shock environments up to 20,000 g's and temperatures ranging from -20°F to over 200° F.

In addition to being rugged, a distinctive feature of the plants telemetry units is that they are capable of not only making routine measurements of such things as temperature, pressure and acceleration, but also capturing data at the end of the flight when things are crashing all around.

The end-event data is captured in milliseconds and then transmitted out to ground station receivers at data rates up to 100 megabits/second before the telemetry unit is crushed or splashes into the ocean. This industry-leading ability to perform test measurements and transmit data under extremely short time conditions has applications not only for military hardware, but potentially for the automotive and aircraft industries.

The Science of Nuclear Security

NNSA Radiation Detection System Used to Resolve Argentine Theft Case

EDITOR'S NOTE: This is the first in a new series of articles we will publish about applied science activities at NNSA's labs and plants.

Early in the morning on February 19, two armed men broke into a well logging facility in Neuquén City, Argentina, and stole a commercial radioactive source. The victimized company uses cesium to help make detailed records, or well logs, of geological formations underground.

Within hours, Argentina's Nuclear Regulatory Authority (ARN) had initiated a search for the stolen cesium, which could potentially be used in a dirty bomb. Using Spectral Advanced Radiological Computer System (SPARCS), ARN was able to locate the cesium the next day, and two people were arrested for the theft.

Since 2002 NNSA has been working with ARN (the agency charged with responding to nuclear or radiological emergencies in Argentina) on plume modeling, emergency operations center improvements, and assistance in procedures for radiological monitoring. In addition, ARN specialists have visited NNSA's Lawrence Livermore National Laboratory in California, the Remote Sensing Laboratory in Nevada, and Radiation Emergency Assistance Center/Training Site in Tennessee.

This cooperation paid off on those two days in February.

The piece of equipment that ARN used was provided by NNSA. SPARCS is a versatile multi-platform radiation detection system that has been designed and built on a foundation of ground and aerial detection experience that spans four decades. It can be used for aerial, ground and boat operations.

During missions, SPARCS consists of a commercial laptop attached to a specialized radiation detection system that records geo-referenced spectra and radiation levels. It can detect low levels of both neutron and gamma radiation.

HIGH TECH DETECTION SYSTEM: Spectral Advanced Radiological Computer System (SPARCS) is a versatile multi-platform radiation detection system. SPARCS has been designed and built on a foundation of ground and aerial detection experience that spans four decades.

Using specialized software, an operator can simultaneously see a current map location with latitude and longitude information, current radiation levels, real-time isotopic identification, gamma source direction, and increases in radiation levels. Spectral information is recorded and can be retrieved later for expert analysis. Data can be telemetered and viewed real-time from a secure internet site.

The incident in Argentina demonstrated the importance not only of NNSA's shared expertise in radiological searches, but of the science behind that talent as well.

Krol Addresses Meeting of Arctic Nation Reps

Admiral Joseph J. Krol, associate administrator for NNSA's Office of Emergency Operations, recently hosted thirty-two representatives of the eight Arctic nations (Canada, Denmark/ Greenland, Finland, Iceland, Norway, Russia, Sweden and the U.S.) at a Las Vegas, Nev., meeting to collaborate and exchange information on best practices for prevention, preparedness and response to environmental emergencies in the Arctic.

Krol told the group that while his organization's mission deals primarily with nuclear and radiological issues, it gets involved in all types of emergency response. He cited emergency communications assistance provided during Hurricane Katrina through the NNSA emergency communications network and support to the Department of Homeland Security and the Federal Emergency Management Agency as part of the national response framework.

The NNSA response provided to Canada during Operation Morning Light, which involved the recovery and cleanup of the Soviet satellite that re-entered near Yellowknife, Canada, was briefed to the group. Lessons learned from the response prompted changes in NNSA methods for working internationally and in harsh conditions.

General Harencak Now DP Assistant Deputy

Brigadier General Garrett Harencak is the new principal assistant deputy administrator for military application in NNSA's Office of Defense Programs. Prior to joining NNSA, Harencak was the commander of the 509th Bomb Wing at Whiteman AFB, Miss. His other Air Force assignments have included a tour in weapon systems requirements and as director of the Headquarters U.S. Air Force Executive Secretariat.

Recent NNSA Awards

B&W Pantex Wins Three Pollution Prevention Awards - B&W Pantex received three Pollution Prevention Awards from the NNSA's Pollution Prevention Awards Program. Honored activities included recycling initiatives, Environmental Management System Program and incorporation of digital X-ray equipment to replace the chemical and photographic film X-ray processor. B&W Pantex was recognized in three areas: Recycling, Environmental Management System and Waste Minimization/Pollution Prevention.

Livermore's Moody Wins Glenn T. Seaborg Award for Nuclear Chemistry - For chemists who work in heavy-element synthesis, discovering a new element can be the highlight of a scientific career. Kenton J. Moody, a staff chemist at NNSA's Lawrence Livermore National Laboratory enjoys the distinction of having discovered not one, but five new elements. As a founding member of the collaboration between the heavy-element research groups at Livermore and the Flerov Laboratory of Nuclear Reactions, in Dubna, Russia, Moody served as a senior member of the teams that discovered elements 113, 114, 115, 116, and 118. Those seminal investigations also led to the first observations of more than 30 isotopes of various heavy elements. Because of his active involvement in the discovery of those elements, Moody has been named the recipient of the American Chemical Society's Glenn T. Seaborg Award for Nuclear Chemistry. Moody was a graduate student with the late chemistry Nobel Laureate Seaborg and, like his mentor, Moody dedicated his career to nuclear chemistry.

NNSA Recognized for Project Management Excellence - The Department of Energy has recognized NNSA for project management excellence for three initiatives this year. NNSA's National Ignition Facility, Microsystems and Engineering Sciences Applications project, and B-3 Building projects were each singled out by the Secretary of Energy as examples of successful management of taxpayer dollars and national security needs. "I am extremely proud of what our teams accomplish every day and these three projects definitely stand out as prime examples of project management excellence," said NNSA Administrator Thomas D'Agostino. "As we move the nuclear security enterprise into the 21st century, Congress and the public need to know that NNSA is spending taxpayer dollars wisely, and meeting its national security mission. One of my priorities as administrator is to promote project management best practices throughout NNSA."

U.S.-RUSSIAN COOPERATION: In March, NNSA's Second Line of Defense (SLD) Program hosted a high-level delegation from the Federal Customs Service (FCS) of Russia. The four-member delegation was lead by Mr. Vladimir Malinin, First Deputy Director of FCS. While in Washington, the delegation met with Administrator Thomas D'Agostino, Principal Assistant Deputy Administrator Ken Baker and Assistant Deputy Administrator David Huizenga.

The meetings focused on the strong collaborative working relationship between NNSA and FCS. The SLD Program strengthens the capability of foreign governments to deter, detect and interdict illicit trafficking in nuclear and other radioactive materials across international borders. In Russia, where SLD began working in 1998, the NNSA and the FCS share both the work and the cost of installing nuclear detection equipment. Both sides are strongly committed to long-term sustainability through their joint maintenance and training programs.

Pictured left to right are: Alexey Avdonin, Head FCS Financial Directorate; Vladimir Rybachenkov, Counselor Russian Embassy; Administrator Thomas D'Agostino; Vladimir Malinin, First Deputy Head FCS; Ken Baker, Principal Assistant Deputy Administrator; Nikolay Kravchenko, Deputy Head Information and Technology Directorate; Alexey Dyshlyuk, Deputy Head Administration of Customs Cooperation.

Stimulus Act Funds Will Enhance NNSA Cleanup

Energy Secretary Steven Chu has announced $6 billion in new funding under the American Recovery and Reinvestment Act (ARRA) to accelerate environmental cleanup work and create thousands of jobs across 12 states, including a major investment in legacy cleanup projects at sites where NNSA has facilities. Projects identified for funding will focus on accelerating cleanup of soil and groundwater, transportation and disposal of waste, and cleaning and demolishing former weapons complex facilities.

"These investments will put Americans to work while cleaning up contamination from the Cold War era," said Secretary Chu. "It reflects our commitment to future generations as well as to help local economies get moving again."

These projects and the new funding are managed by DOE's Office of Environmental Management, which is responsible for the risk reduction and cleanup of the environmental legacy from the nation's nuclear weapons program, one of the largest, most diverse and technically complex environmental programs in the world.

The NNSA sites included in the funding are:

- Los Alamos National Laboratory ($212 million) - Demolish 35 buildings and structures across the site, reducing the footprint by more than 260,000 square feet.
- Nevada Test Site ($44 million) - Identify waste characteristics within the soil at three corrective action sites and install groundwater monitoring wells to provide additional data on groundwater contamination to support future cleanup work. Demolish three major facilities and two smaller structures, removing contaminated materials.
- Oak Ridge: Y-12, East Tennessee Technology Park, and Oak Ridge National Lab sites ($755 million) - Accelerate demolition and disposal of remaining uranium enrichment plant buildings, surplus Manhattan Project era buildings, and highly contaminated uranium processing buildings, and perform soil remediation to protect area groundwater. ARRA funding will render the highest risk facility at the Y-12 National Security Complex (Alpha-5) ready for decontamination and decommissioning by removing all legacy material; remediate the most significant source of mercury contamination to surface water at Y-12; and demolish five dilapidated, contaminated buildings.
- Savannah River Site ($1.615 billion) - Accelerate decommissioning of nuclear facilities and contaminated areas throughout the site, including in-place decommissioning of two nuclear materials production reactors. Recovery Act work includes shipping more than 4,500 cubic meters of waste out of South Carolina and will reduce the site's industrial area by 40 percent, or 79,000 acres, by September 2011.