



NNSA, Y-12 Complete Transfer of Highly Enriched Uranium

NNSA and Y-12 National Security Complex have completed all five phases of the transfer of highly enriched uranium (HEU) into the nation's Highly Enriched Uranium Materials Facility (HEUMF) more than one month ahead of an already accelerated schedule.

HEUMF operations were authorized and loading began in January 2010. After a focused effort completed the first phase of loading from the former warehouse in 73 days, additional HEU located in four processing

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OLD GLORY AT SANDIA : The flag was raised to half-staff in front of Bldg. 800 at Sandia National Laboratories in Albuquerque, N.M., on the first day after employees returned to work following the 9/11 terrorist attacks ten years ago. Silhouetted is then-Security Police Officer Buster Dial. The Sandia Lab News first ran this photo in the Sept. 21, 2001, issue.

NNSA Ships Additional Special Nuclear Material From LLNL

Lawrence Livermore National Laboratory (LLNL) has removed 90 percent of the inventory of nuclear material requiring the highest level of security protection.

The move is part of NNSA's efforts to consolidate Category I and II special nuclear material, which require the highest level of security, at five sites by the end of 2012. This initiative will further improve security and reduce costs as part of NNSA's overall effort to transform the Cold War era nuclear weapons complex

into a 21st century nuclear security enterprise.

"The men and women at Livermore continue to make big strides in reaching NNSA's goal of removing Category I and II special nuclear material from Livermore by the end of 2012, and they are doing this while continuing to perform vital national security work," said Don Cook, NNSA's deputy administrator for Defense Programs. "The removal of the material meets NNSA's goal of transforming a Cold War nuclear weapons complex into

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areas at Y-12 was moved to HEUMF to provide more efficient and secure storage and to free valuable space for materials needed in manufacturing operations.

"I applaud the work done by the men and women at Y-12 and their commitment to implementing President Obama's nuclear security agenda," said Don Cook, NNSA deputy administrator for Defense Programs. "Investments in facilities like HEUMF and our ability to consolidate highly enriched uranium are critical steps in our transition to a 21st century nuclear security enterprise."

Approximately 68 percent of Y-12's HEU is now stored at HEUMF. This consolidation is a significant step toward shrinking the security footprint at the site. The Uranium Processing Facility, now in design, will be constructed next to HEUMF, and the two facilities will work together to accomplish all HEU storage and processing operations in a centralized area. The remaining 32 percent of the HEU inventory requires processing that will be accomplished over the next decade to support the reduced security footprint.

HEUMF is a large concrete structure with adjoining equipment and administrative areas. It provides storage capacity for 12,000 drums and 12,000 cans of material in specially designed storage racks.

Administrator's Corner

In the days following September 11, 2001, the Nation came together to cope with the attacks on New York, Washington, and Shanksville. As we dealt with the fear and uncertainty that beset the nation, we grew stronger, and proved that our shared values are more resilient than anything that may come our way.

As I looked back on the ten years since the attacks, I was reminded how admirably the dedicated men and women across our nuclear security enterprise continue to meet the new challenges, priorities, and opportunities that came out of that tragedy. NNSA has been instrumental in shaping policies and creating technologies to make the world a safer place.

We continue to be on the front lines of the fight to prevent nuclear proliferation. Our scientists and engineers continue to push the frontiers of discovery. We have helped thousands of first responders receive one-of-a-kind training in nuclear and radiological response, making them better prepared in the event of another disastrous attack. Additionally, our efforts help the intelligence community better understand and prepare for the realities of a post-9/11 world on a daily basis.

As we reflect on the lives lost on 9/11, we also look forward to years of continued progress and the implementation of an unprecedented nuclear security agenda that keeps the American people safer than the day before. The importance of NNSA's work will only grow in the years ahead and I am confident that our enterprise is up to the task



Tom D'Agostino

NNSA Ships Additional Special Nuclear Material from LLNL

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a more robust nuclear security enterprise that is smaller, safer and more efficient."

All shipments have been completed in full compliance with safety and environmental laws and procedures. All federal and receiver site requirements were met for these shipments. The deinventory project was initiated in October 2006.

NNSA had originally planned to remove high-security material from LLNL by 2014. However, NNSA has developed an accelerated timeline to remove the material safely and securely by 2012.

NNSA Announces Return of U.S.-Origin Highly Enriched Uranium Spent Fuel From South Africa

In partnership with the South African Nuclear Energy Corporation (Necsa), NNSA has returned 6.3 kilograms (13.8 pounds) of U.S.-origin highly enriched uranium (HEU) spent fuel from a nuclear research facility in South Africa.

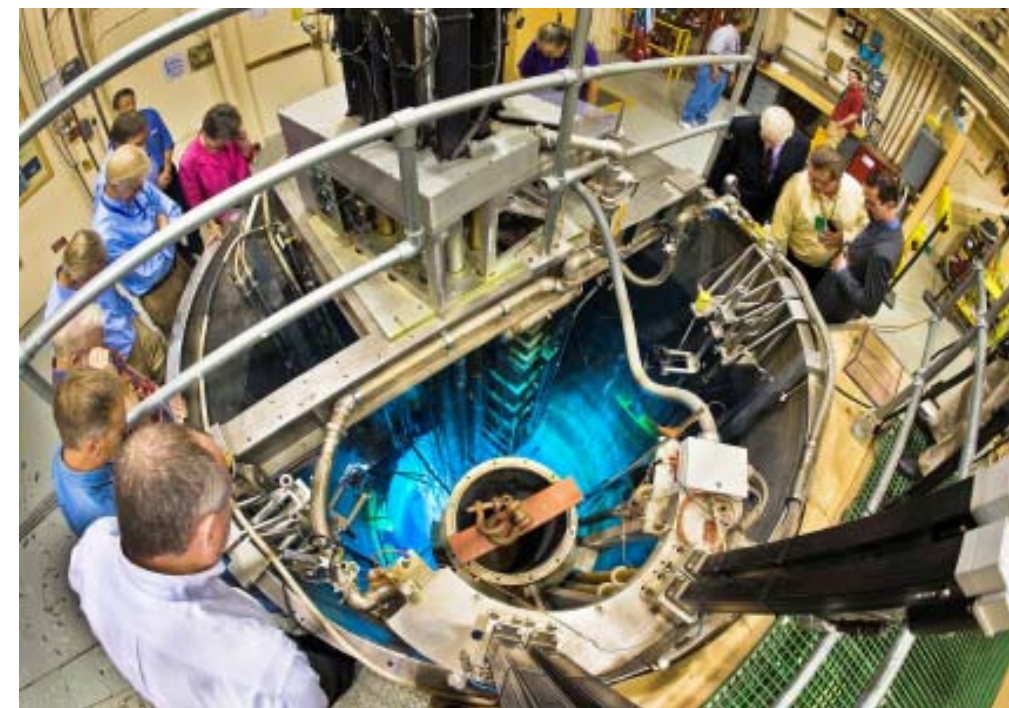
"With this return, we have taken another important step in the global effort to minimize the use of HEU around the world, a vital part of implementing President Obama's nuclear security agenda," said NNSA Deputy Administrator for Defense Nuclear Nonproliferation Anne Harrington. "The completion of this project is another example of the close partnership between NNSA and the South African Nuclear Energy Corporation, and the significant technical expertise and professionalism of Necsa were key factors in the success of the operation."

At the Washington Nuclear Security Summit hosted by President Obama in 2010, leaders from 47 countries committed to minimizing the use of HEU in civilian application, where technically and economically feasible, and to the timely removal and disposition of nuclear materials from facilities no longer using them. NNSA has worked with international partners to remove, or assist with the disposition of 3,091 kilograms of HEU and plutonium. This includes the removal of 1,249 kilograms of U.S.-origin HEU from sites around the world.

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**Anne Harrington
NNSA Deputy Administrator for Defense Nuclear Nonproliferation**

The shipment of U.S.-origin HEU spent fuel from South Africa arrived in the United States on Aug. 16, and will be held in secure storage pending disposition. This effort is the most recent in a long history between the U.S and South Africa to minimize the use of HEU.



10,000th Reactor Pulse Operations: On Sept. 8, 2011, the Annular Core Research Reactor (ACRR) at Sandia National Laboratories, successfully completed its 10,000th reactor pulse operation. The ACRR has been supporting weapons surety for more than 30 years. The first pulse was conducted in April 1979. The ACRR provides unique support to the NNSA and is the only reactor of its kind in the world with its special ceramic fuel rods. Since the shutdown of the Sandia Pulsed Reactor, ACRR has been a key component for qualification alternatives. The environmental testing performed at ACRR enables the NNSA to be able to certify weapons systems with confidence each year without underground testing.

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DOE, NNSA More Than Doubles Feds Feed Families Campaign Goal

This year, DOE and NNSA surpassed the DOE Feds Feed Families campaign goal of 132,000 pounds by donating 330,776 pounds of non-perishable items.

This equals approximately two and a half times the set goal. DOE and NNSA collectively succeeded in raising awareness about how hunger has an impact in each community.



EMPLOYEE GENEROSITY: NNSA Savannah River Site Office employees gather for a group photo at the close of the Feds Feed Families campaign.

NNSA's Pantex, Y-12 Site Offices Collect 49,342 Pounds of Food Combined

This year, NNSA's Pantex and Y-12 site offices entered into a friendly competition to support the Department of Energy's annual Feds Feed Families campaign. The campaign is designed to help local food banks replenish their supplies during the summer months.

For the challenge, both sides agreed that the losing site would fly the flag of the winning site for one day. Federal employees at the two sites collectively donated a total of 49,342 pounds of food over a two-month period. Pantex collected 25,084 pounds of food and Y-12 collected 24,258 pounds. This represents an average of approximately 300 pounds of food per person.

Donations made at the Pantex Plant helped stock the shelves of the High Plains Food Bank. Every month, the food bank helps approximately 68,000 people in the Texas Panhandle, including elderly, handicapped individuals and children. During the



HUNGER RELIEF: Y-12 employees collected food for two months for the annual Feds Feed Families campaign. Federal employees from Y-12 and Pantex together collected a total of 49,342 pounds of food.

summer, this number swells to include school children who usually eat free breakfasts and lunches. The shelves empty quickly during the summer because many food bank supporters take vacations or simply don't think about giving.

In addition to site office employee donations, B&W Pantex employees jumped on the bandwagon and donated an additional 36,861 pounds. "Pantexans are known for their patriotism, generosity, and compassion," said Steve Erhart, Pantex Site Office manager. "Our original goal was to donate 15,000 pounds, but the competition with Y-12, coupled with the excitement of joining the other NNSA sites in this effort, inspired us to work even harder to fight hunger in our community."

Y-12 Site Office's food donations support the work of Second Harvest of East Tennessee which serves as a distribution center offering donated and purchased food items to more than 500 non-profit organizations in an 18 county service area. This hunger relief network provides food to more than 165,000 hungry east Tennesseans with food from Second Harvest.

"I am incredibly impressed by the generosity of both YSO and B&W Y-12 employees," said Ted Sherry, Y-12 Site Office manager. "For YSO, this campaign has been the biggest team building and morale boosting initiative for our office in years. Our folks really came together on this campaign. They spent hours after work together, competed between divisions, had great fun, and saw the impact of their contributions by meeting the inspirational leader of the Second Harvest Food Bank. B&W Y-12, also donated an additional 30,000 pounds to Second Harvest."



COMMUNITY SUPPORT: Pantex Plant employees donated 25,084 pounds of food to help stock the shelves of the High Plains Food Bank.



OVERWHELMING RESPONSE: A DOE Feds Feed Families campaign sculpture contest was held and resulted in 2,160 pounds of food donated and 130 pounds in pledges.



FEEDING FAMILIES: Sandia Site Office Feds Feed Families campaign coordinator Joe Estrada.

The Science of Nuclear Security

Los Alamos Achieves World-record Pulsed Magnetic Field

Researchers at the NNSA National High Magnetic Field Laboratory's Pulsed Field Facility at Los Alamos National Laboratory (LANL) in New Mexico have set a new world record for the strongest magnetic field produced by a nondestructive magnet.

In August the scientists achieved a field of 92.5 tesla, a unit named in honor of inventor, physicist, and electrical engineer

Nikola Tesla, taking back a record that had been held by a team of German scientists. The following day, the LANL researchers surpassed their achievement with a whopping 97.4-tesla field. For perspective, Earth's magnetic field is 0.0004 tesla, while a junk-yard magnet is 1 tesla and a medical MRI scan has a magnetic field of 3 tesla.

The ability to create pulses of extremely high magnetic fields nondestructively (high-power magnets routinely rip themselves to pieces due to the large forces involved) provides researchers with an unprecedented tool for studying fundamental properties of materials, from metals and superconductors to semiconductors and insulators.



The interaction of high magnetic fields with electrons within these materials provides valuable clues for scientists about the properties of materials. With the recent record-breaking achievement, the Pulsed Field Facility at LANL, a national user facility, will routinely provide scientists with magnetic pulses of 95 tesla, enticing the worldwide user community to Los Alamos for a chance to use this one-of-a-kind capability.

The record puts the Los Alamos team within reach of delivering a magnet capable of achieving 100 tesla, a goal long sought by researchers around the world.

Such a powerful nondestructive magnet could have a profound

NEW WORLD RECORD: Yates Coulter (left) and Mike Gordon of Los Alamos National Laboratory make final preparations before successfully achieving a world-record for the strongest magnetic field produced by a nondestructive magnet.

impact on a wide range of scientific investigations, from how to design and control material functionality to research into the microscopic behavior of phase transitions. This type of magnet allows researchers to carefully tune material parameters while perfectly reproducing the non-invasive magnetic field. Such high magnetic fields confine electrons to nanometer scale orbits, thereby helping to reveal the fundamental quantum nature of a material.

Pantex Presses Forward With High Explosives Pressing Facility

A key piece of the Pantex Plant's future began to take shape when ground was broken on the new High Explosives Pressing Facility (HEPF) in August.

Officials from NNSA and Pantex joined local dignitaries to mark the beginning of construction on the new facility at Pantex. The new \$65 million facility will replace buildings constructed during World War II.

"The future of Pantex continues to take shape as construction of the new High Explosives Pressing Facility begins," said Don Cook, NNSA's deputy administrator for Defense Programs. "The new facility at Pantex is part of NNSA's commitment in moving from a Cold War era nuclear weapons complex into a more efficient national security enterprise and is an important investment in our future."

The new 45,000-square-foot HEPF will combine operations currently conducted in six different buildings – two of which date back to World War II – into one state-of-the-art facility. The current facilities suffer from aging infrastructure and

equipment that is more than 20 years old, making them unreliable and difficult to repair.

Construction of the HEPF will be managed by the U.S. Army Corps of Engineers and is expected to take about two and a half years.

site over the years, but to us, it's something much more. This facility represents the future of Pantex. It is



NEW FACILITY GROUNDBREAKING: NNSA and Pantex officials joined local dignitaries to mark the beginning of construction on the new 45,000-square-foot High Explosives Pressing Facility at the Pantex Plant.

"High explosives production and expertise have been a hallmark of Pantex since the first day the plant was in operation," said John Woolery, general manager of B&W Pantex. "This new facility will ensure that Pantex can continue to fulfill its critical role in maintaining the nation's nuclear deterrent. To many, this may look like just another of the many buildings that have been constructed on the plant

years to come."

In addition to providing more modern, reliable production, the HEPF will consolidate activities currently conducted in several different areas of the plant, greatly reducing the movement of high explosives at Pantex. Reduced movement benefits safety and also aids in production, as high explosives moves can restrict other plant operations.

NNSA Conducts Training in Mexico in Preparation for Pan American Games

NNSA's Office of Emergency Operations has provided training in nuclear/radiological search and detection to representatives of the Mexican government in preparation for the Pan American Games to be held in Guadalajara, Mexico, in October. In addition, NNSA has provided medical training to Mexican representatives.

"NNSA continues to provide Mexican authorities with training in preparation of the Pan American Games as part of our ongoing cooperation," said NNSA Associate

Administrator for Emergency Operations Joseph Krol. "Our strong working relationship is critical to ensuring the safety of the fans, athletes, and dignitaries who will be attending the games this fall."

To assist with the Pan American Games, NNSA will loan various nuclear/radiation detection equipment to the Mexican government, ensuring capabilities exist that will enable detection and response to incidents involving nuclear/radiological material. NNSA will also

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Cielo Begins 3-D Weapon Simulations

NNSA has begun production runs focusing on high resolution 3-D weapon simulations on NNSA's largest supercomputer platform, Cielo.

The simulations will be used to ensure the safety, security, and effectiveness of the nuclear stockpile while maintaining the moratorium on underground nuclear explosive testing. Users from NNSA's laboratories – Los Alamos, Lawrence Livermore and Sandia national laboratories – are using Cielo for NNSA's Capability Computing Campaign 2 (CCC2).

"The body of work done on Cielo is one of the largest and most demanding workloads involving modeling and simulation within NNSA. Cielo is primarily utilized to perform milestone weapons calculations," said Don Cook, NNSA's deputy administrator for Defense Programs. "The research we're able to do in computer science, physics, and engineering because of Cielo is a vital part of NNSA's efforts to implement President Obama's nuclear security agenda."

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**Don Cook,
Deputy Administrator for Defense Programs**

Cielo, a petascale resource for conducting NNSA weapons simulations in the 2011-2015 timeframe, can achieve more than one quadrillion floating point operations per second. During May 2011, the Cielo system was upgraded from 1.03 petaFLOPS (72 cabinets) to 1.37 petaFLOPS (96 cabinets). After the hardware upgrade, the Cielo operating system was also upgraded.

Cielo, located at Los Alamos National Laboratory (LANL), provides a production, classified computational resource. It is operated by the New Mexico Alliance for Computing at Extreme Scale (ACES), a collaboration between LANL and Sandia.

U.S., Spain Commence Operations to Prevent Nuclear Smuggling at Port of Barcelona

Radiation detection equipment at the Port of Barcelona, Spain has been successfully installed and its operation initiated as part of a cost-sharing agreement between NNSA's Megaports Initiative and the Spanish Government. The specialized equipment will help detect and deter the illicit smuggling or shipments of nuclear and other radiological materials.

"With the completion of the project in Spain, we now have 38 operational Megaports worldwide and are also one step closer to fully implementing President Obama's nuclear security agenda," said NNSA Deputy Administrator for Defense Nuclear Nonproliferation Anne Harrington.

The Port of Barcelona is the third port in Spain where NNSA has

installed equipment. NNSA's cooperation with Spain began in 2006 with a Megaports installation at the Port of Algeciras. With the start of operations in Barcelona, Spanish Customs is now scanning nearly all of the containerized truck traffic for imports and exports at the three ports, and responding to radiation alarms. NNSA's goal is to equip 100 Megaports by 2018.

The Megaports Initiative's work at the Port of Barcelona is part of NNSA's Second Line of Defense Program, which works collaboratively with foreign governments at border crossings, airports, seaports, and other points of entry to install specialized radiation detection equipment and associated communications equipment.

NNSA Conducts Training in Mexico in Preparation for Pan American Games

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provide support staff and reachback capabilities to ensure operability of nuclear/radiological detection equipment and evaluation of incidents.

Other NNSA upcoming activities associated with preparations for the Pan American Games include a radiation medical emergency training course to be conducted in Guadalajara the week of Oct. 3 and refresher search and detection training and equipment familiarization scheduled for the week of Oct. 10. The Pan American Games will open on Friday, Oct. 14 and close on Monday, Oct. 31.