



# Last HEU Removed From Romania Days Before Presidents Meet in Russia

Less than one week before Presidents Barack Obama and Dmitry Medvedev signed a joint statement expanding cooperation on nuclear security, NNSA officials completed the final shipment of highly enriched uranium (HEU) from Romania to a secure facility in Russia. The shipment was the first to be made by air, unlocking the ability to conduct future shipments more efficiently and making Romania the first country to complete the repatriation of its HEU since President Obama announced his intention to secure all vulnerable nuclear material within four years.

"This represents a major step forward in NNSA's ongoing efforts to implement President Obama's unprecedented nuclear security agenda by securing vulnerable nuclear materials worldwide and reducing the threat of nuclear terrorism," said NNSA Administrator Thomas D'Agostino. "Not only do these shipments clean out the last of the HEU in Romania, but the successful use of an airplane to return spent fuel to Russia opens new opportunities to accelerate our schedule of spent fuel

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**ROLE PLAY:** During Media Day at the Empire 09 exercise, an Albany, N.Y. television reporter tapes a segment explaining how Federal Radiological Monitoring and Assessment Center responders remove anti-contamination protective clothing. See pages 4 and 5 for more on EMPIRE 09.

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# D'Agostino Testifies on Global Threat Reduction

At a recent hearing of the House Armed Services Committee, NNSA Administrator Thomas D'Agostino discussed NNSA's role in implementing the Obama Administration's landmark global nuclear security agenda. NNSA manages the largest nuclear non-proliferation program in the world. Many of those efforts will be crucial to meeting the President's goals.

On President Obama's leadership on nuclear security D'Agostino said, "The President made clear, in his April speech in Prague, in Joint Statements with our Russian partners, and elsewhere, that nuclear weapons remain a fundamental issue facing the international community in the

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## ***Last HEU Removed From Romania Days Before Presidents Meet in Russia***

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shipments.

Reducing international access to dangerous nuclear material is a major part of President Obama's unprecedented commitment to a new era of nuclear security. NNSA's role in the President's agenda includes:

### ***Securing vulnerable nuclear and radiological material***

- The Material Protection Control and Accounting Program has secured 93 percent of Russian nuclear material and warhead sites.
- The Global Threat Reduction Initiative (GTRI) has shutdown or converted 63 reactors in 32 countries from HEU to low enriched uranium.
- GTRI has returned 862 kilograms of Russian-origin HEU fuel and more than 1,200 kg of U.S.-origin HEU.

### ***Cooperating on effective export controls***

- The International Nonproliferation Export Control Program has trained more than 8,300 domestic and 11,600 international export control officials on Weapons of Mass Destruction identification and reviewed more than 7,300 export licenses/requests.

### ***Disposing of plutonium designated as no longer required for defense purposes***

- The Elimination of Weapons-Grade Plutonium Production Program has ended weapons-grade plutonium production in Seversk by shutting down two reactors.
- NNSA's Office of Fissile Materials Disposition has agreed to dispose of 68 metric tons of U.S. and Russian weapons-grade plutonium by converting to mixed-oxide fuel.

### ***Expanding capabilities to combat illicit trafficking of nuclear and radioactive materials***

- The Second Line of Defense (SLD) Program has equipped 160 border crossings in Russia with radiation detection equipment and provided radiation detection systems at 60 sites outside of Russia.
- SLD has installed radiation detection equipment at 23 ports and initiated work at more than 20 additional ports in Asia, Latin America and the Caribbean, Europe, the Middle East, and Africa.

### ***Strengthening the overall effectiveness and efficiency of the international safeguards system***

- NNSA launched the Next Generation Safeguards Initiative to develop the policies, concepts, technologies, expertise, and infrastructure necessary to sustain the international safeguards system.

*For video and photos of the Romanian shipment and more information about NNSA's involvement in the President's agenda, log on to [nnsa.energy.gov](http://nnsa.energy.gov).*

## ***D'Agostino Testifies on Global Threat Reduction***

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21st Century. He has stated that the most immediate and extreme threat to global security is the potential acquisition of nuclear weapons by terrorists. To address this threat, the President has outlined an ambitious strategy to deal with nuclear arsenals, halt the proliferation of [nuclear] weapons to additional states, and prevent terrorists from acquiring [nuclear] weapons or the materials needed to build them."

Concerning the scientific and technical leadership across the nuclear security enterprise, D'Agostino said, "While I am speaking today about a separate major component of the NNSA, the nonproliferation component of our national security mission relies upon similar scientific and technical expertise. It is that scientific and technical nuclear expertise, combined with our proven track record of implementing a number of successful programs, both domestic and international, that makes the NNSA's Defense Nuclear Nonproliferation Program a leader in nonproliferation activities throughout the world. The NNSA nuclear security programs provide an important means to achieve a number of President Obama's objectives."

The complete text of D'Agostino's testimony to the committee is available at <http://www.nnsa.energy.gov/news/2441.htm>.

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# Kansas City Plant Helps Keep B-2 in the Air

The Air Force's B-2 Bomber carries weapons that include components made at the NNSA's Kansas City Plant (KCP). Now it's not just the payload, but the aircraft itself that contains parts made at KCP. When the original supplier's facility shut down last July, the Air Force had to scramble to find another facility to produce a proprietary design high-voltage power supply for Cathode Ray Tubes (CRT) in the cockpit of the B-2. Unable to find a commercial supplier capable of performing the work, they turned to KCP, which is known for high-quality, low-volume work.

These units power eight CRT's in the cockpit of each B-2 aircraft. The plane's mission is typically more than 30 hours, which puts a lot of stress on the high-voltage components. As a result, the Air Force needs about four new units per month to keep 20 B-2's flying.

After KCP received the work in August 2008, it was able to set up the operation, work through material issues, and ship the first qualification part the following January. B-2's now remain in the air with the help of KCP.

KCP's level of technical expertise makes it one of the few entities in the world that is capable of successfully manufacturing the B-2 High Voltage Power Supply. The rigor and results being demonstrated have resulted in a second order for an additional 48 High Voltage Power Supplies.



## Sandia National Laboratories Robot Rodeo Competition

A robot rodeo, held recently at Sandia National Laboratories, New Mexico provided 10 scenarios to familiarize bomb squad members with five kinds of robots needed to operate on short notice.

Competing to show the most effective techniques on key steps in each scenario were teams from the Albuquerque Police Department, Santa Fe Police Department, New Mexico State Police, Kirtland Air Force Base, and Los Alamos National Laboratory.



**BODY RESCUE** - A robot pulls a dummy of a fallen bomb technician to safety.

# EMPIRE 09 Emergency Res

The prospect of not one, but two dirty bombs detonating in a major city within the United States is daunting. Yet that exact scenario is what more than 650 city, county, state, and federal responders faced during the recently completed EMPIRE 09 exercise held in Albany, New York.

The "attack" was focused on two major streets adjacent to the New York State Capitol building and a landmark cathedral. Responders had to deal with issues ranging from mandatory and voluntary evacuations to a radioactive plume, stretching over a wide range of downtown Albany across the Hudson River and into adjacent counties.

EMPIRE 09 started in late April with a table-top exercise involving approximately 75 key city, county, state, and federal responders dealing with the issues surrounding the immediate detonations and the actions they would take to protect human health and safety.

Phase two of the exercise was held the first week of June with responders actually converging on the city to play out their roles.

Those responders came into the exercise as though it was day three of the event. The final phase of the exercise wrapped up with another table-top event transitioning from a crisis to long-term recovery efforts.

For Joseph Krol, associate administrator for NNSA's Emergency Operations Programs, while the exercise itself is important, the lessons learned are critical. "When the real thing happens we will be really prepared," said Krol.



**EMPIRE 09 JIC:** Representatives of federal, state and local agencies work on communication products in the New York State Emergency Management Office Joint Information Center (JIC) in Albany, N.Y.

***“Learning how we can have stronger and better procedures, and understanding how to better the interfaces from the local level all the way to the federal level, is the true value we get out of these exercises.”***

**Joseph Krol  
NNSA Associate Administrator for  
Emergency Operations Programs**

# ponse Exercise



**MEDIA INTERVIEW:** Darwin Morgan, NNSA Nevada Site Office public affairs manager, talks to Albany, N.Y., reporters during a local media tour at the EMPIRE 09 exercise.

## Thank You From Vermont Health Commissioner Wendy Davis, MD

*"I just wanted to take a few minutes to let you all know how much I appreciate the work and professional dedication you ALL have put into this very important exercise."*

*"I know 'This is an exercise. This is NOT a real event.' I also know the key words that have been used to describe the scenario you have been exercising are 'frightening' and 'challenging' – I have used them myself when talking about our role here in Vermont during these past few days."*

*"Even though, in the scenario, Vermont has had it far easier than New York, the exercise events have felt real, even watching from the sidelines. That's a good thing. This kind of exercise gives clarity to our shared mission and gives us empathy with the needs of the people we serve."*

*"By all accounts, this has been an EXCEPTIONAL exercise and, I know, a valuable learning opportunity for all of us to test together our plans, equipment, personnel, our messages, and our coordination."*



**ANALYSIS TENT:** Members of the Federal Radiological Management and Assessment Center team log and review results of radiological samples gathered by field teams during the EMPIRE 09 exercise in Albany, N.Y.

# The Science of Nuclear Security

## NNSA Science Improves Seismology Tools to Detect and Locate Low-Yield Nuclear Explosions

NNSA's Lawrence Livermore National Laboratory is leading a joint project with Los Alamos and Sandia national laboratories, as well as the Air Force Technical Applications Center (AFTAC) and Quantum Technology Sciences, Inc., to improve the accuracy of regional seismic travel time (RSTT) predictions to detect and locate low-yield nuclear explosions.

While seismic research is most often associated with earthquakes, seismic technology is also the primary means to detect, locate and identify underground nuclear explosions.

Underground nuclear testing plays a pivotal role in the persistent and well-documented efforts by states to develop and improve explosive nuclear devices.

Nuclear tests are no longer frequent. However, there are 30-40 earthquakes of magnitude 4 and greater every day - about 10,000 per year. A magnitude 4 earthquake releases energy on the order of a one-kiloton nuclear explosion. Identification and location of the rare, and possibly covert nuclear test, within the cacophony of natural and man-made background seismic activity, is a major national security scientific challenge that NNSA and its labs are in a unique position to meet.

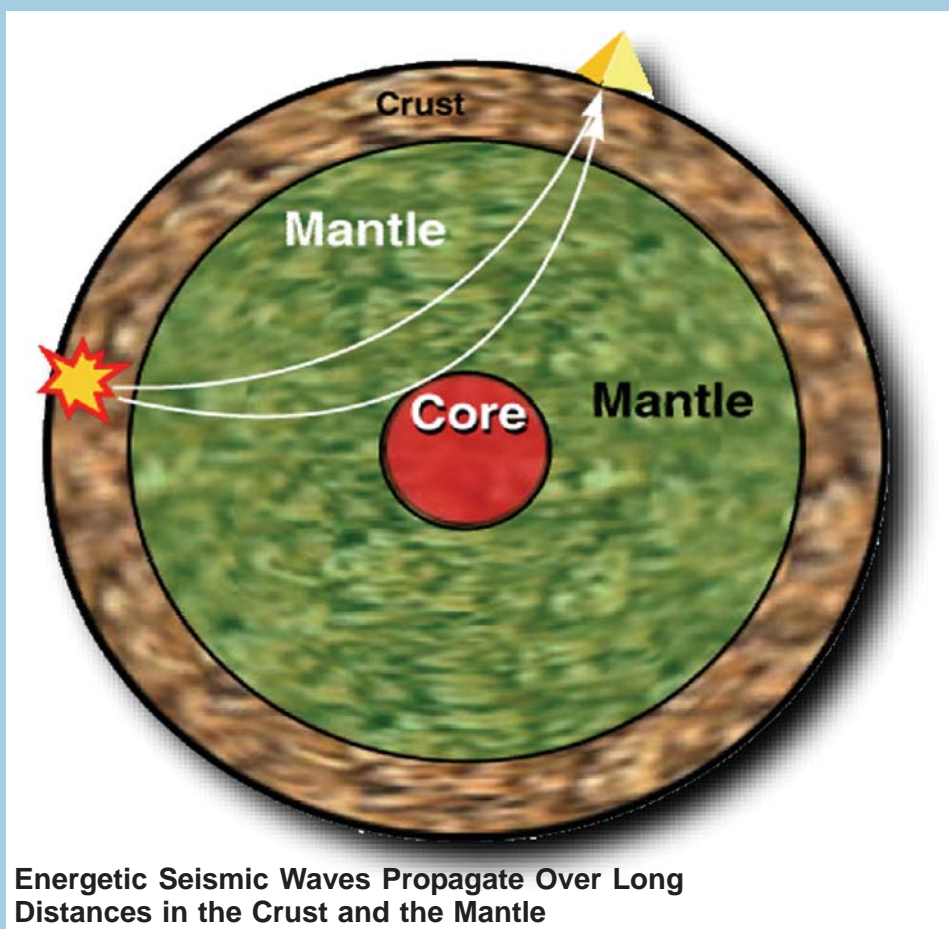
Scientists study the seismic traces (waveform records of the surface ground motion as a function of time, acquired by digital equipment) from networks of seismometers all over the world.

The long-term effort to improve

seismic event location accuracy significantly increases the accuracy of RSTT predictions. The newly developed RSTT model embodies three-dimensional variations in seismic wave

location accuracy by 46 percent (from 17.3 km using a standard one-dimensional model to 9.3 km using the RSTT model).

NNSA efforts have reduced regional location error for small yield events to a level that, until



speed in the earth's crust as well as lateral variability in seismic-wave speed in the earth's upper mantle. The RSTT model increases the location accuracy of small events, previously undetectable at great distance. Tests across Eurasia show that the RSTT model improves median

recently, was only achieved for large, globally recorded events. This NNSA-funded effort has resulted in a significant improvement in regional seismic event location accuracy and further improvement can be expected as complementary research projects mature, thus improving our ability to detect lower yield events.

**PRESIDENTIAL EARLY CAREER AWARD FOR SCIENTISTS AND ENGINEERS:**

The White House announced this month Los Alamos National Laboratory physicist Ivan Vitev has received a prestigious Presidential Early Career Award for Scientists and



Ivan Vitev

Engineers (PECASE). The honor is the highest bestowed by the U.S. government to outstanding scientists early in their careers. Vitev joined the laboratory in 2004 as a J. Robert Oppenheimer Postdoctoral Fellow, the most distinguished postdoctoral appointment at the laboratory. Vitev is widely recognized for his expertise in quantum chromodynamics, the theory of strong interactions, and in energy loss of high-energy particles in hot, dense matter. His scientific work has been used to determine properties of the quark-gluon plasma, a new state of matter discovered in 2000 that is similar to what many scientists believe conditions of the universe were like immediately after the Big Bang. Vitev's research was funded by NNSA and DOE's Office of Science. As a PECASE recipient, he will receive up to five years' funding from the Office of Science to advance his research.

Kennedy Reed



**PRESIDENTIAL AWARD FOR EXCELLENCE IN SCIENCE AND ENGINEERING:**

President Obama has named Lawrence Livermore National Laboratory physicist Kennedy Reed as a recipient of the prestigious Presidential Award

for Excellence in Science and Engineering Mentoring.

Reed is a theoretical physicist at the laboratory, conducting research on atomic collisions in high temperature plasmas.

Reed has been a leader in national efforts to increase opportunities for minority students and professionals in the sciences, and has been instrumental in the development of programs that have had national impact.

He initiated and directed the laboratory's Research Collaborations Program for Historically Black Colleges and Universities and Minority Institutions -- an innovative program that links laboratory scientists with professors and students in forefront research that benefits the laboratory and the universities.

## Reach Out and Tweet Someone

Want to read the latest NNSA news, flip through photos, watch original video footage or find out where we're making headlines? Join us on Facebook, Twitter, YouTube, and Flickr.

In keeping with President Obama's commitment to more open, accessible government, NNSA now has a presence on today's hottest social networking sites.

Several NNSA sites already successfully employ social networking to promote the NNSA message and communicate both internally and externally.

We hope you'll share these links with your friends and contacts who might be interested in the collaborative work we do every day to secure our nuclear stockpile, advance international nonproliferation efforts and develop cutting-edge science and technology.

We also hope that you'll share your photos, video and updates with us so we can make sure everyone with an interest in NNSA knows about the good work we accomplish on a daily basis. Please send content to [jennifer.wagner@nnsa.doe.gov](mailto:jennifer.wagner@nnsa.doe.gov).

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# Nuclear Security 101: Students Participate in NNSA Programs

From coast to coast, NNSA is hard at work this summer educating the next generation of nuclear security experts through a number of outreach programs that offer students hands-on experience within its labs and at NNSA headquarters.

**The Institute for Global and Regional Security Studies** - Pacific Northwest National Laboratory's (PNNL) Center for Global Security and the Henry M. Jackson School of International Studies at the University of Washington have partnered to establish the Institute for Global and Regional Security Studies, which provides students with a unique educational experience combining the expertise of PNNL's scientific and technical staff and resources with the Jackson School's scholarly resources.

Undergraduate and graduate students engage in an international security and nonproliferation curriculum that prepares them to become key personnel for governments, non-governmental organizations, universities, national laboratories and international agencies.

technologies of international nuclear safeguards and detection of nuclear and other radioactive materials. It also presented them with critical assessments of current nonproliferation regimes and arrangements, while bringing together a diverse group of students from different fields of study.

**NNSA Summer Internship Program** - In May and June, NNSA welcomed 42 students to headquarters as part of its Summer Student Internship Program, a 10-week program that provides an opportunity for students to gain experience in a professional environment by participating in the day-to-day activities, utilizing and expanding their academic/professional skills, and to meet and interact with other students from diverse backgrounds from across the country.

NNSA is committed to providing both a learning experience and an expanded opportunity for professional growth. Students work on topics in the business, engineering and general categories, and later deliver a presentation at the closing ceremony scheduled for August.

As part of the summer experience, NNSA also has created the NNSA Learning Academy, which provides students with workshops that will enhance their work experience and improve them as professionals.



**Nonproliferation Graduate Fellow Program  
Class of 2009/2010**

Many Institute for Global and Regional Security Studies alumni are also graduates of the NNSA's Nonproliferation Graduate Fellows Program (NGP) managed by PNNL. NGP fellows are selected to work in NNSA offices for a year to participate first hand in nonproliferation technology and policy programs in the making.

**BNL Nuclear Nonproliferation Course** - In late June, 24 graduate and undergraduate students completed NNSA's inaugural course in nuclear nonproliferation at Brookhaven National Laboratory (BNL) in New York.

The three-week summer program focuses on nuclear nonproliferation and international safeguards and security in an effort to support and encourage students to pursue careers in these fields. The work is vitally important given the emergence of new proliferating states and the need to prevent nuclear material from falling into the hands of terrorists.

The exercises and demonstrations introduced the students to the