



# U.S. Nonproliferation Efforts Continue as Nuclear Material is Removed From Bulgaria

Seventeen kilograms of Russian-origin highly enriched uranium (HEU) have been returned from Bulgaria to the Russian Federation, U.S. Secretary of Energy Spencer Abraham announced. It was one of a string of successful efforts by the DOE-funded Russian Research Reactor Fuel Return Initiative. The fresh HEU was airlifted from Gorna Oryahovista airport in Bulgaria to Dmitrovgrad, Russia, where it will be down-blended.

“The Bush Administration has taken the lead on nonproliferation efforts to help make our world safer,” Secretary Abraham said. “With U.S. leadership and through cooperation and determination with other nations, a more secure world



**HEU RETURNED FROM BULGARIA:** HEU fuel canisters are loaded onto a Russian aircraft.

is eventually attainable. Proliferation of nuclear material is a worldwide problem and requires a worldwide solution. We

must not allow terrorists and others with bad intentions to

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# NNSA Dismantles Last Nuclear Artillery Shell

NNSA has dismantled the last nuclear artillery shell in the U.S. nuclear stockpile, eliminating the vestige of a type of battlefield nuclear weapons that comprised a key element of America’s Cold War arsenal.

A ceremony in Amarillo, Texas, marked the achievement by employees at NNSA’s Pantex Plant who dismantled the last W-79 warhead.

“This administration is committed to reducing the threat of nuclear weapons worldwide,” said Energy Secretary Spencer Abraham. “We have completed dismantlement of another class of nuclear weapons - weapons that were a very important deterrent during the Cold War.”

“Eliminating the last nuclear artillery warhead marks the end of an era in U.S. defense policy that included ground-launched battlefield nuclear

weapons,” said NNSA Administrator Linton Brooks. “This completes an historic step begun by the United States in 1991. I congratulate our employees at Pantex who were involved in this piece of history.”

The United States introduced artillery-fired atomic weapons in its defense arsenal in 1957. Six types were deployed over the

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## Nuclear Nonproliferation

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acquire deadly material and the Department of Energy will continue doing its part.”

The highly enriched nuclear fuel assemblies were originally supplied to Bulgaria by the former Soviet Union for the Russian-designed two megawatt research reactor, located in Sofia. The reactor was shut down in 1989 and is going to be reconstructed. The nuclear fuel was loaded into four fresh fuel transportation canisters provided by the Russian Federation. International Atomic Energy Agency (IAEA) safeguards inspectors and DOE technical experts monitored the process of loading the fuel in the

canisters. An AN-12 Russian cargo plane was used to complete the air shipment of the HEU fuel from Bulgaria.

The shipment of the research reactor fuel from Bulgaria to Russia was part of a U.S.-led cooperative international effort to reduce, and if possible eliminate, the use and storage of high enriched uranium in civilian nuclear activities.

“The Bulgarians have shown leadership as they have cooperated with the U.S., Russia, and the IAEA in seeking ways to reduce the threat of nuclear proliferation, including the return of HEU from Bulgaria to Russia,” NNSA Administrator Linton Brooks said. “Along with the decision to return fresh HEU to

Russia, the Bulgarian government also has made a decision to reconstruct the existing research reactor in Sofia to low enriched uranium fuel. These are important steps in our overall nonproliferation efforts worldwide.”

The shipment of HEU from Bulgaria is the second shipment conducted under a tripartite initiative (the United States, the Russian Federation, and the IAEA) to return Russian-supplied HEU research reactor fuel for long-term management and disposition. The first shipment of fresh Russian-origin HEU fuel from Romania to the Russian Federation was carried out on September 21, 2003.

## NNSA Dismantles Last Nuclear Artillery Shell

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years. The W-79 was designed to be fired from an 8-inch artillery piece. These weapons strengthened deterrence by improving the capability of NATO battlefield commanders to stop a Warsaw Pact armored thrust into Western Europe.

In 1991, President George H.W. Bush announced his decision to retire artillery-fired atomic weapons in the U.S. stockpile. The President made his decision unilaterally, apart from any arms control agreement with the former Soviet Union. The weapons, including all W-79s, were returned to NNSA for dismantlement at the Pantex Plant.

The Pantex Plant plays a critical role in the surveillance of the U.S. nuclear deterrent. Each year approximately 100 weapons from the active stockpile are sent to Pantex where they undergo a

comprehensive diagnostic exam. While most of the weapons are reassembled and returned to the military services, the remaining weapons are subject to destructive evaluation, providing additional insights into the health of the

stockpile. Pantex also refurbishes nuclear weapons in the current stockpile as part of the Stockpile Life Extension Program. The dismantlement of the W79 and other weapons took place over the years as scheduling permitted.



**W-79 DISMANTLED:** Pantex Site Office Manager Dan Glenn (left) examines a mock-up of a W-79 warhead with Brig. Gen. Ronald Haeckel, NA-10 (center), and BWXT Pantex President and General Manager Mike Malloy.

# Kansas City Plant's PIRATE Ready to Set Sail

Monitor, analyze and communicate real-time threat situations.

That's what the Better Environment to Stop Terror (BEST) Portable Image Recognition & Analysis Transducer Equipment (PIRATE) accomplishes.

This unique system of hazard analysis and communication was developed by associates at the NNSA's Kansas City Plant.

The PIRATE is a compact, secure wireless communications platform and hazard analysis system. The system provides a standard personal-computer interface that allows first-responders to conduct threat investigations using global positioning sensors and image recognition software in a self-contained, remote-powered unit.

The system can be deployed in a stand-alone configuration where hazards can be diagnosed on the spot, or placed in remote locations requiring the collected data to be transmitted to regional or national command centers for analysis.

PIRATE collects data through an image recording and analysis method and transmits directly to the control unit. The control unit collects and analyzes the data and communicates the information - via an encrypted, wireless network - to the open architecture transmission and supervision unit for local analysis.



**PORTABLE IMAGE RECOGNITION:** The Kansas City Police Department's robot carries the PIRATE device during a demonstration at the Kansas City Plant. A scenario was created for the demonstration in which an individual was handcuffed to the steering wheel of a car and a suspicious package with a substance seeping out of it was present under the vehicle.

Local site personnel may then determine an appropriate course of action or may transmit the collected data via cellular or satellite telephone to a networked location, anywhere in the world, for further analysis.

This enhanced system is more accurate, user friendly, and delivers real-time data to first responders, military, scientists/laboratories, law enforcement and government agencies.

The demand for smaller and user-friendly technologies for the nation's first responders became top priority following the events of September 11, 2001.

PIRATE meets the demand through the flexibility of the system architecture which enables customization and miniaturization and reduces the at-risk factors for first responders.

As a national security asset, the Kansas City Plant is committed to using cutting edge technologies and scientific expertise to make America safer. PIRATE is the beginning of the facility's quest to leverage its existing resources into technological tools that help protect our homeland.

First responders, the private sector and the federal laboratories will be important partners in this endeavor.

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# Y-12 Develops Mobile Medical Shelter System

A significant new technology for the future treatment of wounded soldiers has been unveiled at the Y-12 National Security Complex.

The Future Medical Shelter System (FMSS) is a highly mobile two-table operating room that can be set up virtually anywhere and perform trauma surgery in a matter of minutes. Duane Bias is the project manager and Lee Bzorgi is the lead engineer.

“The FMSS can literally go from the back of a truck to ‘ready to receive patients’ in about 30 minutes,” Bias said.

“Two key features make rapid set up possible. First, the surgical suite unfolds in a single uniform movement using a unique system that resulted in two patents for Bzorgi, a mechanical engineer. This allows the unit to transform

from an ISO (International Standards Organization) container that is 8 feet high by 8 feet wide by 20 feet long into a surgical suite that is approximately 20 feet by 20 feet in two minutes.

“Second, the unit carries all surgical equipment, tables, lights and supplies onboard in movable cabinets that may be positioned as required,” Bias said.

Another key feature is mobility. “FMSS can be moved easily by truck, rail, ship, cargo aircraft or helicopter. Additional features include some protection against small arms fire and protection against nuclear, biological or chemical contamination. It also can be attached to other existing shelter units in the Army’s inventory to provide facilities that may be sized to meet any mission requirements,” Bzorgi said.

Congressman Zach Wamp, who represents Tennessee’s third district, said, “This technology will save American lives. If we ask our

activities is huge,” Bias said.

FMSS is a project for the U.S. Army Medical Research and Materiel Command at Fort Detrick, Md. It is a \$10 million project with



**MOBILE MEDICAL SHELTER:** A Y-12 electrician works on the Future Medical Shelter System.

soldiers to go and fight, and they get wounded, we don’t want them to wait for treatment. The FMSS will help them get life-saving treatment as soon as possible.” Congressman Wamp has been a long-time champion of this innovative battlefield technology.

While currently designed as a surgical suite, FMSS has potential for other uses. “The reality is that we could turn the surgical suite into anything from a command and control center to a logistics or operations center with few modifications,” Bias said. “So, utility to all facets of the services, or to Guard and Reserve units is significant, and the potential use for homeland defense response

approximately \$7 million for Y-12’s portion of the project.”

The prototype FMSS was designed and built through Y-12’s National Security Programs. This program performs work for government agencies other than the Department of Energy.

BWXT Y-12 is the designer and fabricator of the FMSS. Mobile Medical International Corporation of Saint Johnsbury, Vt.; Duval Designs of Rockland, Maine; Interstate Mechanical of Knoxville, Tenn.; and the U.S. Army’s Soldier Biological and Chemical Command, of Natick Mass., were contracted to support the project.

# NNSA Biologist Works With Law Enforcement, Other Agencies On Anti-Terrorism Task Force

Ultimately, domestic security is a local issue that needs national resources and plenty of local, state and federal coordination. That's the working hypothesis behind the efforts of John-Olav Johnsen of the NNSA Service Center in Albuquerque. John-Olav is serving as the science coordinator and technical advisor to the U.S. Attorney for the District of New Mexico's Anti-terrorism Advisory Council Science Panel and as a volunteer NNSA science advisor and liaison to the Albuquerque Office of the Mayor.

A medical-forensic entomologist, John-Olav is the Service Center's Senior Technical Advisor for Biological Science and its Homeland Security Coordinator and Liaison. He recently received a commendation from New Mexico U.S. Attorney David Iglesias for his leadership in support of law enforcement in the community.

"Through the U.S. Attorney's



**ANTI-TERRORISM NETWORKING:** John-Olav Johnsen (center) of the NNSA Service Center talks to Assistant United States Attorney Sasha Siemel (left) and City of Albuquerque Emergency Manager Jim Hunter.

advisory panel, we're trying to get some synergy between the local scientific community that can help develop new technologies and law enforcement practitioners who need new technologies," John-Olav said.

"We're listening to their ideas and issues and trying to translate that into technical solutions."

In addition to John-Olav, the

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## FEDERAL AGENT

**GRADUATION:** Dr. Everet Beckner, Deputy Administrator for Defense Programs, administers an oath to twenty-three graduates of the Office of Secure Transportation (OST) Agent Candidate Training program. Armed federal agents accompany all shipments of NNSA nuclear materials. They drive the OST tractor-trailers and escort vehicles and operate the communications and other convoy equipment. Federal agents are authorized by the Atomic Energy Act to make arrests and carry firearms in the performance of their duties.

# Infrastructure Update: Roof Management Contract in Place

A five-year, \$50 million contract to provide management of roof repair and replacement at sites in the nation's nuclear weapons complex has been issued by the U.S. Department of Energy's National Nuclear Security Administration (DOE/NNSA) to Detroit-based Building Technology Associates.

The contract, which was issued through Honeywell Federal Manufacturing & Technologies, a prime contractor to NNSA, will enable NNSA to operate under a single management contract for multiple facilities to enhance and extend preservation of its assets by eliminating or reducing roofing defects and thus extending the useful life of facility roofs.

The Roof Asset Management Program was developed by a team of NNSA contractor representatives from Honeywell FM&T, located in Kansas City, Mo.; BWXT Pantex, located in Amarillo, Texas; and

BWXT Y-12, located in Oak Ridge, Tenn. The program also includes partnerships with Bechtel Nevada, which operates facilities at the Nevada Test Site in Las Vegas, Nev., and with the University of California, which operates facilities at the Los Alamos National Laboratory in Los Alamos, N.M. and Lawrence Livermore National Laboratory in Livermore, Calif.

The program uses commercial best management practices and standard industry techniques to repair, replace and maintain roof infrastructure assets.

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## NNSA Biologist

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advisory panel is made up of about 50 scientists from Sandia National Laboratories, Los Alamos National Laboratory, the NNSA Accident Response Group, the Air Force Phillips Lab, universities and the private sector. So far they have held meetings in Albuquerque and in southern New Mexico to promote the science-law enforcement dialogue. Some promising match-ups have already developed in areas such as identification technologies and detection technologies for chemical agents and substances.

John-Olav's career in science has been multi-faceted. Prior to joining the Department of Energy in 1990 as a physical scientist, he worked as a senior entomologist for the U.S. Army Environmental Hygiene Agency in Atlanta, Ga., and prior to that for the New Mexico Department of Agriculture in the Forestry Division.

As a federal scientist employed as a civilian with the Army, he conducted

forensic entomological investigations for the Army Criminal Investigative Division, provided forensic assistance to state and municipal law enforcement agencies and conducted disease vector biology work.

In the New Mexico Forestry Division he directed forest insect and disease surveys, evaluated impacts of forest insect outbreaks, and worked on large-scale aerial spray projects.

The forensic skills, it turns out, are very useful in the post 9/11 security planning environment. In his role as advisor to the Mayor's office, for example, John-Olav has become familiar with the City of Albuquerque's Animal Sentinel program that tracks animal diseases.

"In the event of a terrorist biological attack," he said, "the early symptoms of some possible disease agents of concern would typically also show up in animals. The City's Animal Sentinel program is a key group. The federal side of the community was not aware of this resource, so I was able to bring it to

the attention of the Anti-terrorism Advisory Council and the New Mexico Homeland Security Department and they're working together now."

A licensed pilot and aircraft owner, John-Olav's familiarity with aviation and with aerial spray technology has been of particular value in addressing concerns of possible terrorist use of aircraft and "crop dusting" equipment to disperse biological agents.

Although John-Olav's work is focused on Albuquerque and New Mexico, he says the knowledge, experience and networking created through municipal, state, tribal and federal cooperation rolls up to the Department of Justice and all anti-terrorism advisory councils coordinated by U.S. Attorneys throughout the nation.

"I'm proud that NNSA resources can be shared with the community and with other government agencies as we all work together to protect the nation," he said.

# Los Alamos Program Recovers Orphaned Radioactive Sources

NNSA is on the frontline of U.S. efforts to prevent terrorists from acquiring the materials to make a dirty bomb through its Offsite Source Recovery Program.

The radioactive neutron sources recovered from a small college in New York City recently arrived at an NNSA secure storage and staging area with help from Los Alamos National Laboratory. Over the next year, about 25 more shipments of approximately 200 sources from colleges, universities and research institutions nationwide, all containing small amounts of weapons-grade plutonium, will pass through the new storage facility on their way to Los Alamos and ultimately, the Waste Isolation Pilot Plant at Carlsbad, N.M.

The goal of the Los Alamos-based recovery program is to recover and safely dispose of more than 18,000 excess radioactive sources containing plutonium-239, americium-241 or plutonium-238 by 2010. Sources are used to calibrate instruments, run quality checks on experiments, analyze geological conditions in oil and gas boreholes and for multiple other purposes.

“These sources from Manhattan College have been a high priority since 9/11, and we’ve worked closely with NNSA, with officials at the college and with members of the New York State congressional delegation to make this happen,” said Lee Leonard, who heads the OSRP.

Los Alamos is the only site in the DOE complex with a certified

program for shipping sealed sources to WIPP. Since August 2003, OSR Program field teams have visited institutions throughout the United States to package the plutonium-239 sources, which were among sources issued by the former Atomic Energy Commission under loan/lease agreements dating back to the 1950s.

The OSRP found a new home recently within NNSA’s Nuclear and Radiological Threat Reduction Task Force (NA-20.2), directed by Ed McGinnis (see sidebar story). Since it was set up in 1999, under DOE’s Office of Environmental Management, OSRP has recovered more than 7,700 radioactive sources. During the 1990s, Los Alamos had recovered and disposed of about 1,100 additional sources. The OSRP hopes to recover a total of 2,000 more sources during the 2004 fiscal year, and 18,000 by decade’s end.

“One bright spot is that the average size and thus the amount of radioactive material contained in each source we recover is getting smaller, which means we probably already have recovered most of the sources that could present the highest risk,” Leonard said. “The goal of the OSRP is not to recover every source, just all sources that are excess, unwanted or improperly secured, and thus achieve significant risk reduction.”

## Nuclear Radiological Threat Reduction Task Force

The Nuclear Radiological Threat Reduction Task Force, under which the Offsite Source Recovery Program now operates, was formed last year to control radiological materials by identifying and securing high risk materials both in the U.S. and overseas. It is also charged with identifying vulnerable research reactors worldwide that need additional assistance in securing fresh and spent nuclear fuel.

NNSA Administrator Linton Brooks said the effort “shows Secretary Abraham’s commitment to meeting the proposed threat by nuclear and radiological terrorism on a global basis.” Ed McGinnis, who heads the task force, says the new effort consolidates DOE’s programs in the U.S. and abroad and will address the full spectrum of threat reduction. He says the task force will work closely with the International Atomic Energy Agency and the State Department.

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# BWXT Y-12 And Tennessee State University Strengthen Mentoring-Protégé Agreement

As part of a strong mentor-protégé agreement, BWXT Y-12 is providing a loaned executive to Tennessee State University to lead the cooperative efforts between the company and the university.

BWXT Y-12 has signed an agreement with TSU President James Hefner allowing Benjamin Thomas, a project manager with BWXT Y-12 Technical Computing, to provide a technology/management bridge between the two institutions. Thomas may serve in the loaned executive capacity for up to five years.

Dennis Ruddy, BWXT Y-12’s president and general manager, said that the loaned executive initiative “will significantly contribute to Y-12’s achieving its objectives of promoting technological growth and business development opportunities within TSU. It will further serve as a means for ensuring that a higher percentage of minority students are aptly prepared with the engineering and

science skills that are so critically needed in support of Y-12 national security missions.”

Under the agreement, Thomas will be co-located between Nashville and Oak Ridge working with TSU on the program. BWXT Y-12 and TSU established their mentor-protégé agreement in December 2001. TSU, located in Nashville, is a participant in the Historically Black College and Universities program.

The TSU-BWXT Y-12 mentor-protégé agreement also supports TSU’s participation in the Tennessee Louis Stokes Alliance for Minority Participation, a program that has a goal of doubling the number of minority students in science, technology, engineering and mathematics during the next five years.

Part of Thomas’ role will be to coordinate TSU’s participation in the Louis Stokes program with the other participating institutions—the



**Y-12 LOANED EXECUTIVE:** BWXT Y-12 project manager Benjamin Thomas.

University of Tennessee, Vanderbilt, Middle Tennessee State University, LeMoyne Owens College and the University of Memphis.

The BWXT Y-12/ TSU mentor-protégé agreement is the first of its kind across the DOE Complex.

# NNSA Portal Receives Administrator’s Gold Medal

The NNSA’s Kansas City Plant, Lawrence Livermore National Laboratory, Sandia National Laboratories, BWXT Pantex and the NA-63 Office of Procurement and Assistance Management placed themselves on the leading edge of communications and system/process integration with the development of the award-winning NNSA NA-63 portal.

These organizations were recognized with the prestigious NNSA Administrator’s Gold Medal of Excellence for Distinguished Service at the annual NNSA Procurement and Property Seminar in Santa Fe, N.M.

The award was presented to the Kansas City Plant’s project leader Susie Ross Ackley, technical lead Lynette Kidd, Marcus Gatewood, and other design team members from

LLNL, SNL, and BWXT Pantex. LANL, NTS, Y-12 and the Albuquerque Service Center were also recognized for contributing funds to support the project.

The OPAM portal effectively links the procurement and property organizations throughout the NNSA Nuclear Weapons Complex. The portal grants access to approximately 200 users who commonly share and maintain data.