



# Office of Nonproliferation and International Security (NIS)

National Nuclear Security Administration  
Defense Nuclear Nonproliferation

[www.nnsa.energy.gov/nonproliferation/nis](http://www.nnsa.energy.gov/nonproliferation/nis)

## Highlights



The Office of Nonproliferation and International Security applies program, technology and policy expertise to:



**Safeguard and Secure** nuclear material to prevent its diversion, theft and sabotage.



Negotiate, monitor and **verify** compliance with international nonproliferation and arms control treaties and agreements.



**Control** the spread of WMD-related material, equipment, technology and expertise.



Develop and implement DOE/NNSA nonproliferation and arms control **policy** to reduce the risk of weapons of mass destruction.

# NIS Conducts International Training Sessions to Strengthen Nonproliferation Expertise

Among the many important undertakings of the Office of Nonproliferation and International Security (NIS) is the training of international partners on how to

prevent the spread of weapons of mass destruction related materials, equipment, and technology and to verify compliance with international nonproliferation treaties

and agreements. Specific examples of some of these training activities are provided below.

## NNV Conducts Training Sessions for IAEA

Nuclear Verification 

In the first quarter of FY2012, the Nuclear Noncompliance Verification (NNV) Program conducted two hands-on noncompliance verification training sessions for the International Atomic Energy Agency (IAEA)—Advanced Experimental Fuel Counter (AEFC) and Hot Cell and Glovebox Sampling. Both of these training programs were unique, real-world experiences for IAEA inspectors.

In August 2011, NNV conducted initial training on the AEFC for the IAEA in Vienna, Austria, led by Howard Menlove of Los Alamos National Laboratory (LANL), the instrument designer. In October 2011, NNV followed-up this initial classroom training with an in-field training program for four IAEA inspectors at the Institute of Nuclear Physics in Tashkent, Uzbekistan. The in-field training allowed participants to measure highly enriched uranium (HEU) and low enriched uranium (LEU) spent fuel from a Russian IRT type fuel. Inspectors practiced setting up and operating the AEFC under field conditions and under the supervision of the LANL experts.

In addition to the AEFC training, NNV conducted the first Hot Cell and Glovebox Sampling training for the IAEA at the Andronikashvili Nuclear Center in Tbilisi, Georgia, October 31–November 2, 2011. This training program gave participants familiarity with and appreciation for the

hot cells, gloveboxes, and supporting equipment utilized in small-scale reprocessing facilities. Representatives from Pacific Northwest National Laboratory provided expert classroom lectures and facility information. The Georgians provided first-hand information about their facility.

The Andronikashvili Nuclear Center is an ideal setting for this training program as it houses a Soviet-era IRT reactor and reprocessing facility that currently have no radiation contamination—a facility structure that inspectors are likely to encounter in their verification

activities. The lack of contamination in the facility enabled every participant to tour the facility openly, use the hot cell and glovebox manipulators, and climb inside the hot cells and gloveboxes to identify optimal sampling locations. The Georgian operators were more than happy to interact with the participants and answered many detailed questions about the structure and operations of the facility.

Based on highly positive feedback, the IAEA requested another offering of the Hot Cell and Glovebox Sampling training, currently scheduled for June 2012. ■



IAEA inspectors and Los Alamos trainers inspect the AEFC prior to the start of training in Tashkent, Uzbekistan.

## CBM Program Initiates Nuclear Forensics Training with ASEAN Regional Forum

Nuclear Controls 

NIS' Confidence Building Measures Program (CBM) held a workshop December 7-9, 2011, in Bangkok, Thailand, on nonproliferation nuclear forensics for members of the Association of Southeast Asian Nations (ASEAN) Regional Forum (ARF). The workshop was a ground-breaking first step to building nuclear forensics capabilities in Southeast Asia and initiated activities to fulfill the mandates laid out by the Nuclear Security Summit, the Global Initiative to Combat Nuclear Terrorism (GICNT), the IAEA, and President Obama's call for more nonproliferation engagement with Southeast Asian countries.

CBM partnered with the European Commission's Joint Research Centre-Institute for Transuranium Elements (JRC-ITU) and the Kingdom of Thailand during the workshop to provide training for more than 80 participants from 18 countries and international organizations. Experts from LANL, JRC-ITU, the IAEA, NNSA, the State Department, and the

Thai Office of Atoms for Peace gave presentations on "Core Capabilities" in nuclear forensics, comparing nuclear forensics and traditional forensics; the need for National Response plans to deal with seized nuclear material; and the challenges of forensic analysis. They also urged States to draw upon existing nuclear infrastructure to perform forensic analyses. These in-depth expert technical presentations for ARF member states in Bangkok built upon a September 2011 multinational conference in Singapore that established nuclear forensics as a regional priority and encouraged States to focus on the need for national plans to deal with nuclear trafficking.

A highlight of the December workshop was a field visit to the Megaports installation at Laem Chabang, where Thai port, customs, police, and nuclear officials employed

a radiological source to demonstrate their integrated response to a seizure of nuclear materials. A table top exercise at the port demonstrated to participants the need for regional cooperation and forensic capabilities, including national nuclear libraries, when dealing with nuclear material of unknown origin. ■



## INECP-Rosatom Workshop on Export Controls for Regional Technical Experts

Nuclear Controls 

In late October 2011, NIS' International Nonproliferation Export Control Program (INECP) and the Russian Federation's State Atomic Energy Corporation (Rosatom) hosted a successful three-day regional training course in Moscow for export control licensing officials from several Former Soviet Union (FSU) countries. These officials are responsible for preventing transfers of weapons of mass destruction (WMD)-related items from their countries to destinations of concern. The course came as a result of the December 2007 Action Plan agreed to by the head of Rosatom, Sergey Kiriyenko, and the U.S. Department of Energy's (DOE) Deputy Secretary, Daniel Poneman, to jointly assist other countries in the development of export control implementation capacities.

Export controls are one of the 13 areas for collaboration identified by the Nuclear Energy and Nuclear Security Working Group of the U.S.-Russia Presidential Commission, established by President Obama and President Medvedev in July 2009. Participants at the October workshop were from eight FSU countries—Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Tajikistan, Ukraine, and Uzbekistan.

The workshop provided novice to mid-level export license reviewers with an opportunity to enhance their understanding of the challenges associated with reviewing WMD-related "dual-use" export license applications. Dual-use items and know-how have civilian applications while also being useful in the development, production,

testing, or delivery of WMD. U.S. and Russian specialists provided participants with greater clarity of some of the technical aspects associated with determining whether or not dual-use commodities are export-controlled, thus strengthening nonproliferation efforts in their home countries. ■



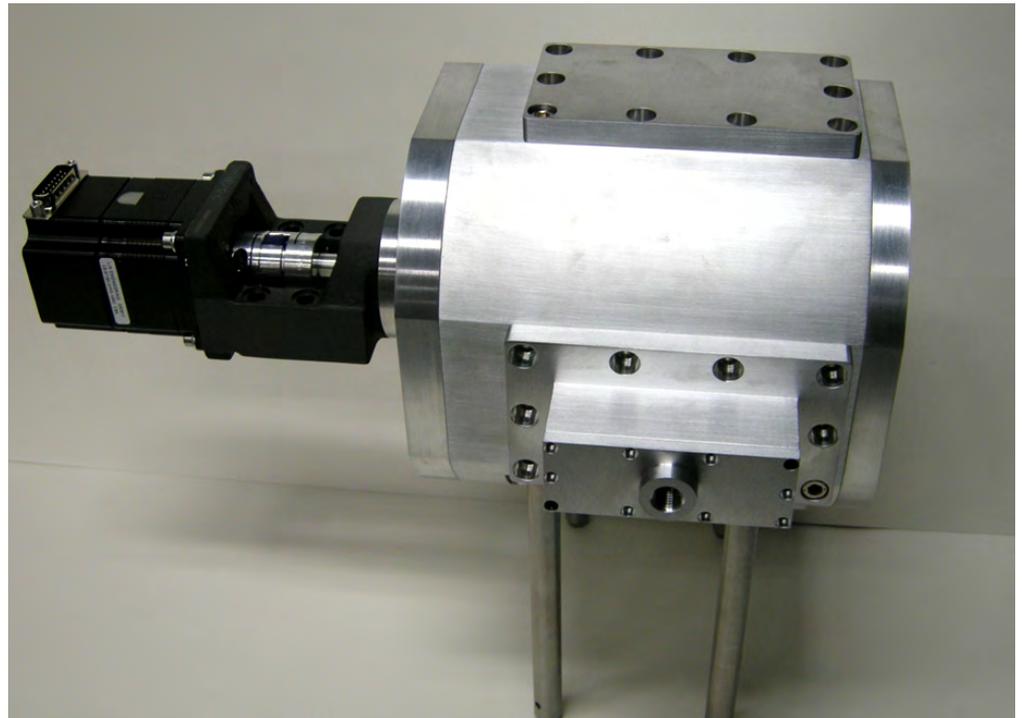
## Shared Investment by NIS and National Labs Develops Cutting-Edge Safeguards Technologies

Technologies such as Laser Ablation Absorbance Ratio Spectroscopy (LAARS) and other environmental sampling techniques are strengthening the international community's confidence that prohibited nuclear weapons-related activities are detected and deterred in a timely manner. In doing so, these innovative science and technology tools advance U.S. and global nonproliferation objectives.

NIS' Office of Nuclear Safeguards and Security is overseeing the development of LAARS and other new concepts to provide early warning of undeclared enrichment. These activities are implemented under the Next Generation Safeguards Initiative's (NGSI) Safeguards Technology Development program and involve several DOE National Labs. Pacific Northwest National Laboratory invested in basic science to develop and demonstrate a laser-based instrument to analyze airborne uranium particles. This up-front investment led to an NIS decision to fund prototype development for LAARS, which will have the capability to rapidly detect just a few enriched uranium particles within the millions of background dust particles found in industrial environments. If LAARS detects uranium enriched above the gas centrifuge enrichment plant's (GCEP) declaration, timely response measures can be started automatically.

To monitor compliance with State's safeguards agreements, the IAEA relies on a series of technical measures, data exchanges, and inspections to verify the peaceful use of nuclear material and technology.

GCEPs represent particularly formidable safeguards challenges, especially as their size and enrichment capacities expand. Currently, IAEA inspectors collect environmental swipe samples



*An integrated LAARS environmental aerosol sampling system collects and analyzes microscopic GCEP uranium particles.*

and ship them off-site to an analytical laboratory for assay. Environmental sampling can detect very minute quantities of nuclear material released to the environment during normal processing activities, and therefore serves as a deterrent to undeclared activities. However, these samples are collected infrequently and analysis turnaround time can be considerable. New technology is needed to address this changing landscape. Nuclear production facilities, such as uranium enrichment plants, pose special challenges that require cutting-edge technology solutions.

### **LAARS offers many advantages, including:**

1. Collects environmental samples continuously without the need for increased inspections or intrusive access.

2. Captures uranium process emissions quickly, before they are lost through ventilation or diffused through the facility, then can be time-stamped and later reconciled against the facility's declared activities. In contrast, hand-swipe sampling can collect environmental samples that were produced months or years earlier, making it difficult to correlate sample analysis with the current facility production record.
3. Detects minute quantities of enriched uranium, thus providing a powerful, sustained deterrent to facility misuse.

# NIS Provides Leadership in Policy Activity Aimed at Nonproliferation

In 2011, NIS took the lead in ushering changes through the Federal Register and approval process in order to amend the DOE regulation concerning unclassified assistance to foreign atomic energy activities. With the changes to nuclear commerce over the past twenty years, DOE saw it as imperative to update Title 10 of the Code of Federal Regulations (CFR), Part 810—Assistance to Foreign Atomic Energy Activities—to reflect the way U.S. nuclear companies conduct business today and to facilitate U.S. conformity to Nuclear Suppliers Group Guidelines. 10 CFR Part 810 “empowers the Secretary of Energy to authorize U.S. persons to engage directly or indirectly in the production of special nuclear material outside the United States.” In essence, “810 approvals” affirm that the recipient government pledges to use the acquired technology exclusively for peaceful purposes. The recipient government also ensures it will not re-transfer the acquired technology to another country without the consent of the supplier-country government.

The revisions to the regulation update and clarify several provisions, and identify information applicants are required to submit in support of applications for an

authorization under this Part. The revisions are intended to reduce uncertainties for industry users concerning which foreign nuclear-related activities by U.S. persons are “generally authorized” under the regulation and which activities require a “specific authorization” from the Secretary of Energy. Countries on the specific authorization list require approval by the Secretary of Energy before unclassified nuclear activities can be exported from the United States to that country.

In addition to changes to the country authorization lists, the revisions to the rulemaking clarify what types of technology transfers—which can include either technical data or technical assistance—fall within the scope of the regulation. The revision also updates definitions and points of contact information for the Department.

All revisions made to the Part 810 regulation are critical in enabling DOE to control the export of nuclear technologies and services while protecting the interest of, and advancing, U.S. nonproliferation and other national security objectives. To view the proposed rulemaking in its entirety, visit the Federal Register at [www.gpoaccess.gov/fr/](http://www.gpoaccess.gov/fr/). ■

## NIS Hosts Webinar on 10 CFR Part 810 Proposed Revisions

On November 2, 2011, NIS hosted a webinar to discuss the implications of the proposed amendment to 10 CFR Part 810. Over 85 nuclear industry representatives participated in the webinar, which provided them an opportunity to engage with NIS about the proposed changes.

Led by NIS’ Senior Policy Advisor, Rich Goorevich, the webinar walked participants through the proposed changes and how these changes will affect them. Afterward, participants were encouraged to take part in a Q&A session about the proposed changes. While this session did not constitute formal comments on the proposed rulemaking, it did allow participants to gain clarification on aspects of the proposed rulemaking before submitting their formal comments via the Federal Register. The commenting period ended December 7, 2011. NIS is reviewing all comments and preparing to address recommendations from industry, government, and academia via the Federal Register.

To view the webinar presentation and all comments, visit [www.regulations.gov](http://www.regulations.gov) and search for “DOE-HQ-2011-0035.”

## HEU Transparency Program Renews Human Connection

Nuclear Verification 

A U.S. delegation to the Siberian Chemical Enterprises (SChE) in Russia, sponsored by NIS' Office of Nuclear Verification, reconnected with a special acquaintance in November 2011 when team members met 13-year-old Sofia Ovchinnikova, a resident of the closed nuclear city of Seversk. The U.S. team, led by David Wall of the NNSA's Y-12 Site Office, was conducting a visit to monitor the conversion of Russian HEU into LEU under the 1993 U.S.-Russia HEU Purchase Agreement.

In November 1999, 13 month-old Sofia successfully underwent surgery at the Children's Hospital of the Westchester Medical Center in the United States to

repair a congenital heart defect. U.S. HEU Transparency Program staff, in partnership with a New York-based charity, had arranged financial and logistical support for Sofia and her mother, Olga Victorovna Ovchinnikova, to travel to the United States and receive the surgery at no cost. At the time, advanced pediatric heart surgery was not available in Russia.

Today, Sofia lives in Seversk, attends the seventh grade, and leads a normal, active life. SChE management arranged and attended the reunion between the Ovchinnikova family and HEU Transparency Program monitors. The group celebrated Sofia's continued good health with bowling and cake. The

Russian guests conveyed their enduring appreciation for the efforts of Ed Mastal, the former HEU Transparency Program Director, in making Sophia's surgery possible.

Current HEU Transparency Program Director Greg Dwyer said, "I am proud to lead a nuclear nonproliferation program that has not only established successful technical cooperation with our Russian colleagues, but has also strengthened those ties by demonstrating a commitment to our shared humanitarian values."

Rashit Giniyatulin, head of SChE's International Cooperation Department, said "Under this Program, not only are megatons turned into megawatts, but good fellowship is established between representatives of two states—fellowship that could not leave people's hearts untouched, in a figurative and literal sense."

The NNSA's HEU Transparency Program monitors HEU conversion at four facilities in Russia to ensure that all LEU delivered under the Agreement is derived from downblended HEU from dismantled Russian nuclear weapons. Russian weapons-derived LEU is shipped to the United States, fabricated into nuclear fuel, and used to generate nearly 10% of U.S. electricity. Nearly 440 metric tons (MT) of Russian HEU has been converted into LEU to date—the IAEA-defined equivalent of about 17,600 nuclear weapons. HEU downblending under the Agreement is on track for completion in 2013 with the cumulative elimination of 500 MT HEU, the equivalent of 20,000 nuclear weapons.



U.S. and Russian experts celebrate Sofia Ovchinnikova's successful surgery in February, 2000.



U.S. HEU Transparency Program monitors David Wall (left) and Carolyn Smith (second from right) celebrate with Sofia Ovchinnikova (second from left) and her mother, Olga Ovchinnikova (right) in November, 2011.



NIS

### For More Information

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