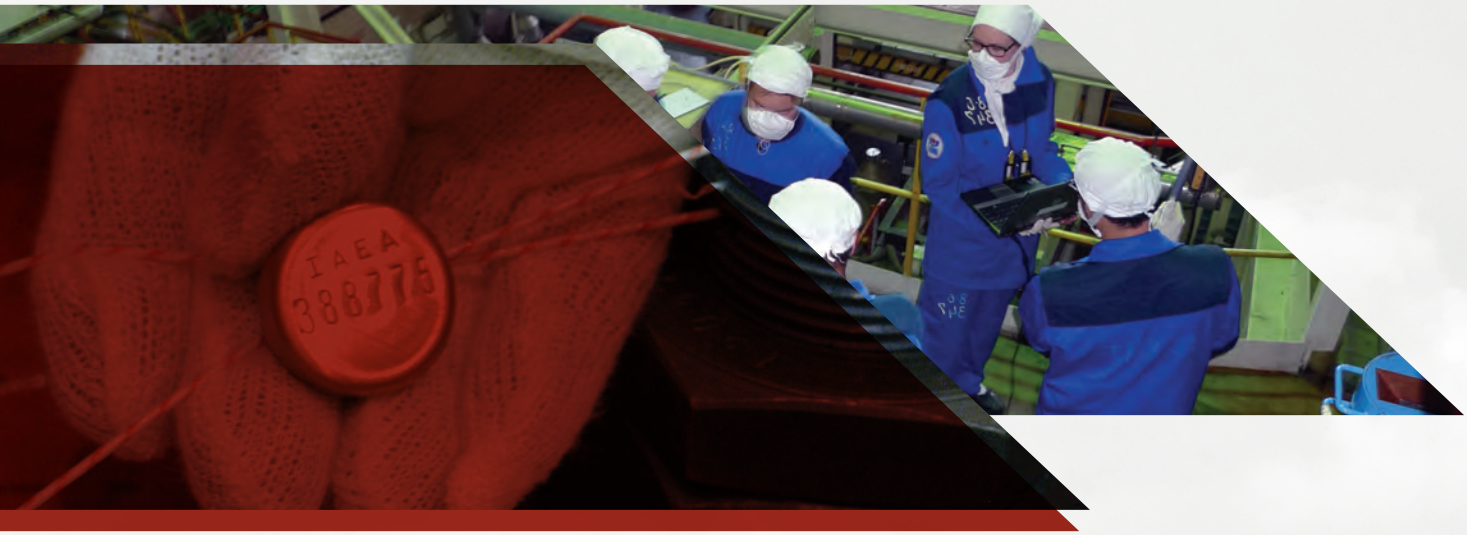
National Nuclear Security Administration

Office of
Nonproliferation
and International
Security (NIS)



2014

INTERNATIONAL NUCLEAR SAFEGUARDS ENGAGEMENT PROGRAM

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INTERNATIONAL NUCLEAR SAFEGUARDS ENGAGEMENT PROGRAM

The International Nuclear Safeguards Engagement Program (INSEP) at the U.S. Department of Energy's National Nuclear Security Administration (DOE/NNSA) is an integral part of DOE/NNSA's Next Generation Safeguards Initiative (NGSI), a multiyear program launched in 2008 to develop the policies, concepts, technologies, expertise, and safeguards infrastructure necessary to strengthen and sustain the international safeguards system as it evolves to meet new challenges. As NGSI's international engagement component, INSEP's mission is to work with international partners to support and enhance nuclear safeguards implementation at all stages of civil nuclear development. These collaborations aim to improve the effectiveness and the efficiency of safeguards throughout the nuclear fuel cycle and support the nonproliferation regime by helping partners develop nuclear infrastructure that emphasizes safeguards. INSEP collaborates with partners around the world to:

- Prepare the safeguards infrastructure necessary to support the safe, secure, and peaceful use of nuclear energy;
- Enhance the implementation of International Atomic Energy Agency (IAEA) safeguards, thereby reducing the likelihood of theft or diversion of nuclear material for non-peaceful purposes; and
- Test and deploy new safeguards technologies to meet current and future safeguards challenges.

The IAEA expects approximately 30 new countries to initiate nuclear power programs in the coming years, increasing the burden on an already strained safeguards system. These "newcomer" countries will require capable safeguards infrastructure and the related expertise to manage nuclear material and technology associated with the development of a nuclear power program. The international safeguards system is challenged by evolving proliferation threats, expanding IAEA responsibilities, the diffusion of sensitive technology via illicit networks, and a retiring safeguards workforce. Innovative solutions, including the development and implementation of new safeguards technologies, must keep pace with these changes to ease the burden on the IAEA and ensure that countries generate nuclear power while meeting international nonproliferation obligations.

INSEP'S PARTNERS

To facilitate the safe, secure, and peaceful global expansion of nuclear energy, INSEP cooperates with more than 25 bilateral and regional partners on more than 100 technical projects to strengthen the international safeguards system. A number of countries require legislative and technical support to prepare the infrastructure and procedures necessary to provide timely, correct, and complete declarations pursuant to the Additional Protocol (AP), and INSEP cooperates with nearly a dozen partner countries to strengthen their AP implementation. In total, INSEP trains more than 500 foreign practitioners each year on international and domestic safeguards.

With its ability to draw on the technical expertise of the DOE/NNSA National Laboratories, INSEP has concluded more than 240 projects with international partners and has deployed more than 30 new or customized safeguards technologies in partner countries in an effort to address specific safeguards issues or enhance the implementation of safeguards. In some cases, these technologies have been adopted by the IAEA and incorporated as part of the safeguards approach for certain facilities.

ABOUT SAFEGUARDS

What are International Nuclear Safeguards?

International nuclear safeguards provide assurances to the international community that civilian nuclear material is not being used for the illicit manufacture of nuclear weapons. They consist of a set of technical measures used to verify that a State's nuclear material is accounted for and not diverted to nuclear weapons or other nuclear explosive devices and provide credible assurance of the absence of undeclared nuclear material and activities, in accordance with the terms of the State's safeguards agreement with the IAEA.

Comprehensive Safeguards Agreements and Additional Protocols

INFCIRC/153 (corrected) and INFCIRC/540 (corrected) are two IAEA documents that serve as the basis for safeguards agreements negotiated between States and the IAEA. These documents are of particular relevance to INSEP's efforts to strengthen the implementation of international safeguards, as concluding a Comprehensive Safeguards Agreement (CSA) based on INFCIRC/153 (corrected) along with an AP based on INFCIRC/540 (corrected) constitutes the new standard for effective safeguards verification under the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). For States with both a CSA and an AP in force, the IAEA is able to provide credible assurances to the international community that all nuclear material remains in peaceful nuclear activities. INSEP's engagement with partner countries is shaped by the safeguards requirements outlined in these documents.

SAFEGUARDS INFRASTRUCTURE DEVELOPMENT

INSEP helps countries develop the safeguards infrastructure necessary for effective nuclear material stewardship. Projects cover a range of activities designed to build the capacity and expertise fundamental to the development of a safe, secure, and peaceful nuclear power program that is fully compliant with international nonproliferation norms. INSEP closely coordinates its infrastructure development program with the IAEA Milestones Process, which provides guidance on developing the necessary infrastructure for countries considering nuclear power. By aligning its program with key elements of the Milestones Process, INSEP provides partner countries with comprehensive training in accordance with international standards and best practices.

INSEP hosts a training course for AP implementation in Jakarta, Indonesia.

Participants in a Train-the-Trainer Workshop in the Republic of Korea practice identifying nuclear material using the HM-5, a standard handheld gamma-ray detector.

Facility operators at Ulba Metallurgical Plant perform holdup measurements together with INSEP staff, the IAEA, Kazatomprom, and the Kazakhstan Atomic Energy Committee.

INSEP worked with the Brazilian National Nuclear Energy Commission to upgrade its Uranium Neutron Coincidence Collar, which is used to measure uranium content in fresh fuel bundles.

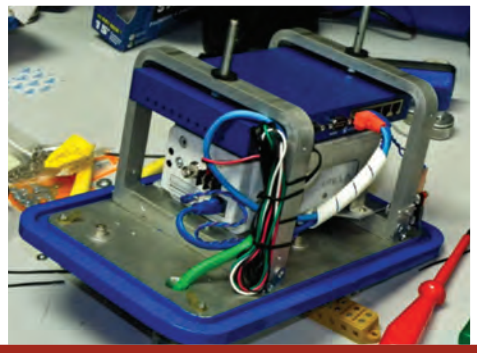
ENHANCING SAFEGUARDS IMPLEMENTATION

INSEP helps increase the effectiveness and efficiency of safeguards implementation in partner countries. INSEP's projects directly support the development and improvement of State systems of accounting for and control of nuclear material and build the capacity of State or regional authorities responsible for safeguards implementation (SRAs). SRAs are a critical link for strengthening the international safeguards system. INSEP's outreach activities directly enable States to provide correct and complete facility and State-level declarations to the IAEA per their obligations under their Comprehensive Safeguards Agreements and Additional Protocols. Capacity building, regulatory development, and technology transfers help ensure that States develop the necessary accounting and reporting systems to detect and deter the diversion of nuclear material and enable the IAEA to verify the peaceful intent of countries' nuclear programs.

ADVANCED SAFEGUARDS TESTING

INSEP modifies, demonstrates, and evaluates next generation safeguards technologies to meet the specific needs of partner countries and enable more correct and complete reporting to the IAEA. These technological advancements are intended to reduce the requirement for on-site inspector presence at particular facilities and increase the consistency of international safeguards reporting to help alleviate the growing burden on an already strained safeguards system.

INSEP is working with partners in Europe to test a prototype of the Hybrid Enrichment Verification Assay, a technology designed to nondestructively characterize the contents of uranium hexafluoride cylinders.



INSEP provided a new surveillance capability to the Brazilian-Argentine Agency for Accounting and Control of Nuclear Material (ABACC), employing commercial off-the-shelf technology with an integrated back-up system to better meet inspectorate requirements.

ENGAGEMENT TOOLS

INSEP engages with partners on a wide range of topics through a diverse set of activities that can be tailored to meet the needs of government officials, policy-makers, and facility and regulatory staff in partner countries, as well as the IAEA.

Example Engagement Topics

- Nonproliferation and Safeguards Regime Overview
- Fuel Cycle Fundamentals
- National and International Legal Instruments
- Additional Protocol Implementation
- State Systems of Accounting for and Control of Nuclear Material
- Safeguards Regulations
- Inspections and Enforcement
- Operator-Regulator Interactions
- Physical Inventory Taking
- Design Information Questionnaire/Design Information Verification
- Material Accounting and Control Measurement and Reporting
- Non-Destructive and Destructive Assay
- Holdup Measurements
- Quality Assurance & Quality Control
- Containment and Surveillance
- Remote Monitoring and Process Monitoring Systems
- Environmental Sampling Analysis
- Advanced Safeguards Technologies for Bulk Handling Facilities
- Information Management Systems and Processes

Example Engagement Methods

- Seminars for policy-makers
- Safeguards legislation/regulation review and preparation
- Technical training for regulatory staff and inspectors
- Technical training for operator staff
- Train-the-trainer workshops
- Laboratory/facility tours and fellowships
- Safeguards and nonproliferation curriculum development
- Application of facility-specific safeguards systems
- Development and testing of advanced safeguards technologies

COORDINATION WITH THE IAEA

INSEP cooperates with regional organizations, including the Asia Pacific Safeguards Network (APSN), the Arab Atomic Energy Agency (AAEA), the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC), and the European Atomic Energy Community (Euratom). The objective of this collaboration is to assist the organizations in achieving their own safeguards-strengthening objectives and supporting the mission of the IAEA. INSEP has supported regional workshops on nuclear regulation and legislation, radiation protection, nuclear power project management and leadership, and nuclear safeguards and security.

The IAEA and the international community increasingly recognize the need for improved coordination among the various countries providing safeguards training and outreach around the world. Together with partner organizations in the Republic of Korea, Japan, Europe, and elsewhere, INSEP continues to coordinate these activities in an attempt to leverage combined resources and expertise. Such efforts will become more important as additional countries consider developing civilian nuclear power for the first time and/or make new commitments to develop “Centers of Excellence” related to nuclear security and nonproliferation training.

INSEP coordinates and co-sponsors multilateral events with the IAEA Department of Safeguards such as technical trainings, workshops, conferences, and seminars. In consultation with the IAEA, INSEP has provided sustained infrastructure development support to a number of countries, including Serbia, Morocco, Kuwait, the United Arab Emirates, Vietnam, Thailand, Malaysia, Indonesia, the Philippines, Iraq, Jordan, and Myanmar, to enable effective implementation of the Additional Protocol. INSEP works closely with the IAEA to understand the IAEA's priorities, respond to IAEA requests, and maintain consistency with IAEA safeguards requirements and guidance.

COORDINATION WITH REGIONAL ORGANIZATIONS AND OUTREACH PROVIDERS

Office of Nonproliferation and International Security (NIS)

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