

**“Prevention of Smuggling at United States Ports”**  
**Before the House Transportation & Infrastructure, Coast Guard and Maritime**  
**Transportation Subcommittee & the House Homeland Security Committee, Border and**  
**Maritime Security Subcommittee**

**Introduction**

Good morning Chairman Hunter, Chairwoman McSally, Ranking Member Garamendi, Ranking Member Vela, and distinguished Members of the Subcommittees. Thank you for the opportunity to testify with my colleagues from the Department of Homeland Security (DHS) and the Department of Energy (DOE) and for your interest in the Domestic Nuclear Detection Office’s (DNDO) efforts to prevent the smuggling of nuclear or other radioactive materials via our Nation’s maritime ports.

In his opening remarks at the Nuclear Security Summit this past April, President Obama stated that “the danger of a terrorist group obtaining and using a nuclear weapon is one of the greatest threats to global security.” We know that terrorist organizations have long sought nuclear materials, and if given the means, would likely exploit the opportunity to use them for nefarious purposes. While the likelihood of a nuclear attack is presumed to be low, we cannot dismiss the threat itself. An attack on U.S. territory with a nuclear device – or even a radiological dispersal device – would have profound and catastrophic consequences.

The nuclear security enterprise encompasses a spectrum that spans non-proliferation of materials, physical protection of nuclear and other radioactive materials, detection of such materials out of regulatory control, rendering devices safe, response and recovery to incidents, and forensics and attribution of materials and devices. DNDO has specific, focused responsibilities for two elements in this spectrum: nuclear detection and technical nuclear forensics.

To fulfill this mission, DNDO relies upon our partnerships with federal, state, local, tribal, territorial, and international partners as well as those in the private sector, academia, and the national laboratories.

My testimony today focuses on efforts to strengthen the maritime portion of the global nuclear detection architecture, by promoting national nuclear detection architectures abroad, supporting operational readiness domestically, and improving the technical nuclear forensics capabilities of the U.S. government (USG).

**Developing the Global Nuclear Detection Architecture**

DNDO is responsible for the coordination of federal efforts to detect and protect against attempts to import, possess, store, develop, or transport nuclear or other radioactive materials out of regulatory control that may be used as weapons against the Nation.

To that end, DNDO, with its interagency partners from the Departments of Defense (DoD), Energy, State (DoS), Justice (DOJ), and the Office of the Director of National Intelligence (ODNI), coordinates the development and enhancement of the global nuclear detection

architecture, which is a framework for detecting, analyzing, and reporting on nuclear and other radioactive materials that are out of regulatory control. The architecture presents a layered, multi-faceted, defense-in-depth approach to ensure prospective terrorists face multiple obstacles. It serves as the groundwork for continuously improving the Nation's capabilities to detect nuclear or radiological threats internationally and domestically. Further, DNDO is responsible for implementing the domestic portion of the global nuclear detection architecture.

## **International Efforts**

Consistent with our layered approach to detection, DNDO's efforts to secure the homeland from the threat of nuclear terrorism begin overseas. A *global* nuclear detection architecture The exterior layer relies largely on the decisions of sovereign foreign partners to develop and enhance their own national and regional detection architectures. To that end, DNDO promotes the development of national nuclear detection architectures, in close cooperation with the Department of State and other interagency partners and multilateral organizations like the International Atomic Energy Agency (IAEA), the Global Initiative to Combat Nuclear Terrorism (GICNT), and INTERPOL.

Close interagency cooperation is exemplified by DNDO's work with Department of Energy's Office of Nuclear Smuggling Detection and Deterrence (NSDD) for capacity building in the international layer of the global nuclear detection architecture. In addition to NSDD deployments of radiation detection, DNDO-NSDD coordination extends through many enhancement activities, including technical analyses, training, exercises, and other performance evaluations. Both organizations continue to share their collective operational best practices with partner countries to strengthen the global nuclear detection architecture.

Through these same international organizations, DNDO assists partner nations in their endeavors to develop national and regional detection architectures, by promoting guidance, sharing best practices, and offering training courses. These efforts focus on helping nations form the foundational elements of any viable architecture, to include capability in planning, risk assessment, strategy development, legal and regulatory frameworks, and the integration of intelligence networks and law enforcement. To date, DNDO's international outreach and coordination efforts have supported the planning of national-level detection architectures in 84 IAEA Member States.

DNDO also supports broader national outreach efforts designed to support the global nuclear detection architecture. One mechanism of particular benefit has been the Nuclear Security Summits, launched by President Obama in 2010. This series has served as an invaluable international forum for improving global nuclear security within a number of commercial pathways, to include the maritime supply chain. In November 2015, DHS, DOE, and other USG representatives participated in the Nuclear Security Summit Maritime Security Workshop co-sponsored by the United States and the United Kingdom to promote radiation detection in the maritime environment. In total, 15 countries, nine international organizations, three terminal operators, and several academic institutions came together to share best practices and enhance measures to remove materials out of regulatory control. This effort directly supported the

Department's Congressionally-mandated endeavor to scan 100% of U.S.-bound maritime cargo containers overseas.

At the 2016 Nuclear Security Summit, 14 nations endorsed the results and best practices from the workshop. Moreover, 23 countries, along with INTERPOL, recorded their support for a "gift basket"<sup>1</sup> on National Nuclear Detection Architectures, thereby affirming their commitment to strengthening detection capabilities overseas.

In sum, international cooperation and the work accomplished through the Nuclear Security Summit process have provided meaningful contributions to building a multi-faceted, multi-layered approach for detection so nuclear and other radioactive material out of regulatory control can be interdicted before being transported to the United States.

## **U.S. Borders**

The layered approach to countering nuclear terrorism continues at our borders. To fulfill DNDO's responsibility to implement the domestic portion of the global nuclear detection architecture, we work with DHS operational components to develop and deploy detection technologies. DNDO procures large-scale fixed radiation detection systems and small mobile devices for employment at our ports of entry, along our land and maritime borders, and in the interior of the United States. As such, we collaborate with the U.S. Coast Guard (USCG), U.S. Customs & Border Protection (CBP), and the Transportation Security Administration (TSA).

To bolster detection capabilities at our maritime borders, DNDO has procured portable radiation detectors for CBP Air and Marine Operations (AMO) as well as USCG so that all boarding teams are equipped with mobile devices to scan for the presence of radiation. To augment USCG's ability to identify a radionuclide that has been detected, DNDO recently procured a new technology, called Human Portable Tripwire. These small, wearable devices enable faster detection, identification, and adjudication of nuclear and other radioactive sources.

DNDO has also acquired Small Vessel Standoff Detection portable nuclear detection equipment for use by USCG and CBP AMO to increase the probability of detecting threats on-board small vessels when encountering such vessels. To facilitate the scanning of inbound cargo containers, DNDO, in collaboration with CBP, has also procured and deployed radiation portal monitors and radioisotope identification devices for use at the ports of entry. As a result, today, nearly 100% of all incoming maritime containerized cargo is scanned for radiological and nuclear threats at our seaports.

## **Domestic Efforts**

Our layered approach persists within our borders and shores. Building operational detection capacity through training, exercises, and cross-jurisdictional protocols is integral to securing the maritime domain. Therefore, DNDO works with federal, state, local, tribal, and territorial agencies to build flexible, multi-layered capabilities.

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<sup>1</sup> Gift baskets are nuclear security commitments made jointly by multiple international partners.

To further our domestic capabilities to detect and interdict nuclear and other radioactive material out of regulatory control, DNDO is currently engaged with all 50 states and 36 of the USCG's Area Maritime Security Committees. Since intelligence and information sharing is integral for our collective success, DNDO efforts are focused on bringing together federal, state, local, tribal, and territorial partners at the outset. DNDO and DHS's Office of Intelligence & Analysis, along with our federal interagency partners at the Federal Bureau of Investigation (FBI) and the National Counterterrorism Center (NCTC), ensure that state and local partners have the information and tools necessary to address evolving threats. State and major urban area fusion centers, State Emergency Control Centers, and the FBI Joint Terrorism Task Forces (JTTFs) provide the necessary information exchange pathways. In the event of an emergency, this connected system provides federal, state, local, tribal, and territorial personnel with the ability to exchange sensitive information in a timely and secure manner.

To enhance situational awareness of radiological and nuclear threats and provide technical support to operational partners, DNDO's Joint Analysis Center provides information products and technical expertise. DNDO's Joint Analysis Center Collaborative Information System provides nuclear alarm adjudication support to operational partners, including state, local, tribal, and territorial partners in the maritime environment. This system is connected to the Triage system, maintained by the DOE's National Nuclear Security Administration, which enables seamless transition when national-level adjudication assistance is required.

DNDO provides program assistance to aid maritime partners in developing radiological and nuclear detection programs based on lessons learned in the West Coast Maritime Pilot, a collaborative effort with partners from Puget Sound, WA, and the Port of San Diego, CA. For example, DNDO has recently been working with the USCG Sector Hampton Roads, a region that includes the entire coast of Virginia, the Chesapeake Bay, and the James River up to the Port of Richmond. DNDO has worked with the region to develop a detection program consisting of a regional concept of operations, standard operating procedures, and multi-year training and exercise plan. Since the establishment of this program, DNDO has assisted the region with several related maritime exercises to ensure operational proficiency and agencies within the region assisted in piloting a newly developed Maritime Radiological and Nuclear Boat Operations course.

To ensure operational partners, including those in the maritime environment, are prepared to respond to a threat, DNDO dispatches a unique "red team" to challenge fielded capabilities using specialized nuclear and other radioactive sources and scenarios. DNDO supports maritime partners by conducting overt and covert assessments of operations by intentionally introducing radioactive sources and mock devices against deployed defenses to evaluate the performance of fielded technology, training, and protocols. Engagements are conducted through the Area Maritime Security Committees or directly with the federal, state, or local maritime agency. Recent engagements included partners from Hampton Roads, VA; San Diego, CA; and Philadelphia, PA.

## **Improving Technology**

In parallel with efforts to deploy technologies to the field, we continue to explore ways to enhance our fielded capabilities. To improve the performance of radiation portal monitors and gain efficiency at land and maritime ports of entry, CBP and DNDO worked closely on implementing an approach to reduce the number of nuisance alarms. Radiation portal monitors routinely detect benign radioactive materials in the stream of commerce, resulting in a significant operational burden for CBP field officers who must resolve these alarms. CBP and DNDO worked closely to evaluate and implement revised radiation portal monitor parameter settings, reducing nuisance alarms (by 78% on average) without sacrificing detector performance against threat materials. We are also collaborating with CBP's Laboratories and Scientific Services to use machine learning to further reduce the number of nuisance alarms in radiation portal monitors deployed to ports. This algorithm is undergoing an assessment this June-August during which it will be installed and run in the real operational environment on incoming and test cargo as well as a variety of threat and benign sources.

To advance technology to detect threats in the maritime domain, DNDO performs accelerated development, characterization, and demonstration of leading-edge technologies. Two examples of this research and development work include:

- The *Advanced Technology Demonstration Program*, which seeks to bring together advanced detector hardware and smart algorithms for demonstration and characterization. One project is characterizing the Airborne Radiological Enhanced-sensor System, a prototype radiation detection system mounted on a helicopter for aerial searches. This effort seeks to provide a capability via an aircraft-borne detection system during intelligence-driven operations to detect and intercept nuclear and other radioactive threats at distances far removed from major population centers and critical infrastructure, and with faster response times than interdictions made via boats and cutters.
- The *Nuclear and Radiological Imaging Platform Program*, where DNDO is developing and evaluating emerging technologies to detect shielded materials while clearing benign conveyances at land and maritime ports. One such effort is a project with the Massachusetts Port Authority, DHS Science and Technology's Border and Maritime Security Division, and the United Kingdom Home Office to develop and evaluate the next generation non-intrusive inspection imaging equipment. The technology will be evaluated in the Port of Boston next year and, if successful, will demonstrate a next generation integrated system capable of detecting both nuclear material and contraband.

## **Advancing Technical Nuclear Forensics**

An act of nuclear terrorism or the interdiction of a nuclear or radiological threat at a U.S. port would necessitate rapid, accurate attribution based on sound scientific evidence. Technical nuclear forensics, when coupled with intelligence and law enforcement information, supports leadership in determining the origin of materials and, thereby, facilitators of terrorist activities. DNDO's National Technical Nuclear Forensics Center helps to ensure the readiness of the overarching USG nuclear forensic capabilities, advances our technical capabilities to perform

forensic analyses on nuclear and other radioactive materials seized prior to detonation, and maintains an expertise pipeline for nuclear forensic scientists. As with its detection mission, DNDO must closely collaborate with interagency partners, particularly those in the FBI, DOE, DoD, DoS, and the intelligence community.

The readiness of U.S. nuclear forensics capabilities to respond to events has improved markedly in recent years. This improvement has been demonstrated by the successful execution of increasingly realistic and complex interagency exercises of nuclear forensics operations involving interdicted materials and devices, and post-nuclear detonation scenarios. For example, this past fall, DNDO served as the Lead Planner in a successful land-based and maritime exercise of the National Technical Nuclear Forensics Ground Collections Task Force, whose mission is to collect vital forensic evidence in the immediate aftermath of a nuclear detonation to assist in determining the responsible entity. The task force, comprised of members from the DoD, DOE, and the FBI, collects debris samples near the site of the detonation for analysis at designated laboratories. Exercise Prominent Hunt 15-2, which took place in Southern California, simulated a nuclear detonation near the ocean. This was the first time the task force had to coordinate the collection of simulated forensic evidence at sea.

## **Closing**

Maritime and port security is vital to the flow of global trade and commerce. An act of nuclear terrorism via our Nation's maritime environment would have potentially catastrophic effects on the global supply chain, both directly and indirectly. To prevent nuclear terrorism, DNDO works collectively with international, federal, state, local, tribal, and territorial partners to enhance capabilities to ensure adversaries encounter multiple obstacles should they seek to attack us using nuclear or other radioactive material. Efforts to develop national and regional detection architectures abroad, research and development to advance technologies for detection, and deployment of systems at and within our borders are imperative to minimize the risk of an attack in the United States. Likewise, our work to continue advancing our national nuclear forensics capabilities is important in ensuring those responsible are held accountable for their actions. We will continue to work with our partners to bolster defenses against the threat of nuclear terrorism, and we sincerely appreciate the attention and support from your subcommittees in preventing such an event from occurring.

Thank you again for this opportunity, and I am happy to answer any questions.