**Opening Statement**

**Of**

**Dr. Chuck Gallaway**

**Deputy Director**

**&**

**Mr. Mark Mullen**

**Assistant Director, Architecture Directorate**

**Domestic Nuclear Detection Office**

**Department of Homeland Security**

**Before the Senate Homeland Security and Governmental Affairs Committee**

***The Global Nuclear Detection Architecture:***

***Are We Building Domestic Defenses That Will Make the Nation Safer***

**July 16, 2008**

## Introduction

Good morning Chairman Lieberman, Ranking Member Collins, and distinguished members of the Committee. As Deputy Director for the Department of Homeland Security's (DHS) Domestic Nuclear Detection Office (DNDO) and Assistant Director for Architecture, we would like to thank the Committee for the opportunity to discuss the work we have done at DNDO to develop an enhanced global nuclear detection architecture.

## Overview of the Global Nuclear Detection Architecture

One of the earliest accomplishments of DNDO was the completion in November 2005 of what we call the baseline architecture analysis, which was our first look at the global nuclear detection architecture. The building blocks of the architecture are detection systems, along with the necessary supporting systems and capabilities. These detection systems and capabilities are structured into layers of detection and interdiction functions, deployed both domestically and overseas. When we speak about an enhanced global nuclear detection architecture, we mean a time-phased plan for strengthening nuclear detection systems worldwide. In 2005, when we performed the baseline architecture analysis, we analyzed the detection systems that existed worldwide at that time and identified options for strengthening them. That set the stage for a time-phased effort, which DNDO and our partners have been pursuing ever since, to strengthen the architecture by filling gaps, addressing vulnerabilities, improving technologies, building necessary infrastructure, and raising awareness about radiological and nuclear threats and the role of detection systems in mitigating them.

The architecture is developed with interagency and DHS partner input. While DNDO has been tasked to develop the enhanced architecture, the responsibility for actual "on the ground" implementation of the architecture resides with other agencies and partners. Federal partners include Customs and Border Protection (CBP), Department of Energy (DOE), Department of Defense (DoD), Federal Bureau of Investigations (FBI) and Department of State (DoS), pursuant to current implementation agreements. Important implementation roles are also played by State and local agencies, private industry, and foreign countries. Because of the importance of early engagement with potential users of detection systems, considerable effort has been made to involve DNDO's partners throughout the planning and development process for strengthening the architecture. This division of labor in the architecture development and implementation can be succinctly summarized as "centralized planning with decentralized execution." Through this management construct, the architecture builds squarely upon, and is aligned with, the existing roles, responsibilities, functions and statutory authorities of the partners.

International portions of the architecture require close coordination with DoD, DOE, and DOS, as well as components of DHS with international responsibilities and relationships. The border portions are closely coordinated both within DHS (e.g., with CBP and the United States Coast Guard (USCG)), as well as with other relevant agencies. The interior portions of the architecture are being closely coordinated with Department of Justice (DOJ), including the FBI, and other Federal, State, and local entities.

The time-phased aspect of the enhanced architecture is important because it allows for the gradual integration of current and near-term technologies and approaches, as well as longer-term options that may draw upon technologies that are currently in the R&D phase and that may not be available for implementation for several years. Ultimately, to successfully prevent nuclear and radiological terrorism, detection systems, broadly defined, must be able to (1) encounter the adversary; (2) successfully detect and identify encountered threats; and (3) successfully interdict those threats. A multi-layered approach is essential. It is predicated on the understanding that no single layer of defense can detect all attempts at nuclear and radiological smuggling with one hundred percent effectiveness, but that multiple layers working in concert, i.e., defense in depth, can compensate for and eventually overcome shortcomings in individual layers. For this reason, the architecture provides multiple detection and interdiction opportunities overseas, at U.S. borders, and within the U.S. to effectively increase the overall probability of system success. Over time, the architecture will be improved and expanded by such means as developing better RN detection technologies, improving concepts of operations (CONOPS), enabling real-time reporting of detection events, and providing effective responses to real threats.

**Development Process**

Beginning with its baseline architecture analysis in 2005, DNDO adopted a geographical/transport model of the global architecture, based on the flow of weapons or materials from point of origin, or source, through a series of detection “layers,” to targets, typically in the United States. The architecture analysis involves five steps that form the technical basis for planning. First, establish the baseline, i.e., identify and describe the existing, baseline architecture. Second, identify gaps, vulnerabilities, and areas that need improvement. Third, develop options for improvement, including technical advances, policy shifts, operational concepts, and enhanced coordination or integration approaches; the options should be time-phased, reflecting near-term, mid-term and long-term time horizons. Fourth, analyze the options in terms of risk reduction, direct and indirect costs, feasibility, and other qualitative and quantitative factors that could affect decisions. Lastly, provide recommendations (again time-phased) for further development of rad/nuc capabilities and for strengthening the layered approach to detection and interdiction. The overall aim is substantial risk reduction through a balanced, robust, adaptive/responsive, cost-effective, and layered strategy.

**Initial Progress and Ports of Entry (POE) Security**

The architecture, as it existed in 2005, consisted of a large number of individual programs focused on particular areas of the architecture. Although individual programs were successful on their own terms, they were not always well-integrated; the lack of integration was recognized as a gap in the baseline architecture. Improvements could be gained through better coordinating programs and by transmitting information across layers. In addition, there are requirements within each layer, for example, alarm adjudication, that achieve economies of scale by applying a single capability or approach across multiple programs and architecture layers. Furthermore, the entire architecture benefits from sharing proven concepts of operation and good practices across multiple programs and layers. Unifying these procedures allows additional economies by consolidating software development and requirements and reducing individual program maintenance and support costs. Development of new technologies typically has application in multiple architecture layers as well. Therefore, both the development of new capabilities and the test and evaluation of those capabilities with their associated concepts of operation, support the entire architecture in a crosscutting manner.

DNDO’s early work has been focused largely on container scanning at sea and land POEs. As deployments to these pathways approach completion, resources can increasingly be directed toward addressing other vulnerabilities. In December of 2007, DHS met the Congressionally-mandated goal of the SAFE Port Act of scanning with RPMs all incoming containerized cargo at our top 22 seaports, which represents 98% of all incoming containerized cargo. Three years ago, we were only scanning 22% of cargo at seaports. This is real and measurable progress. In addition, we are now scanning with RPMs 100% of truck cargo entering the United States from Mexico and 91% of truck cargo entering the United States from Canada, resulting in a composite total of 96% of all truck and sea-containerized cargo entering into the U.S. being scanned for radiological and nuclear threats. Furthermore, we have plans in place to reach 100 percent coverage across the Northern Border in 2009.

**Non-POE Analysis and Progress**

The architecture design is predicated upon a phased approach and seeks to address all threat pathways entering the United States, which include land, sea, and air; each of these in turn can be further subdivided into authorized pathways through POEs and unauthorized pathways that bypass POEs (non-POE). To be effective, the defensive countermeasures along each threat pathway will require a multi-layered approach utilizing a variety of technology and operational capability solutions. In addition to ongoing deployments at POEs, work has continued throughout 2008 to address vulnerabilities associated with non-POE border crossings.

Within the borders of the United States, i.e., the “domestic interior” part of the architecture, major efforts have been devoted to broader engagement with State, local, and tribal officials to expand domestic detection and interdiction functions, and timely information sharing and analysis. DNDO’s future plans are designed to directly address all of these concerns and the dynamic nature of the threat.

DNDO is also working closely with its intra-agency partners to address the aviation pathway. By December 30 2007, as a result of a DHS departmental initiative including CBP, TSA and DNDO, CBP was scanning all international general aviation aircraft arriving in the United States. Meanwhile, during 2008, DNDO, in partnership with CBP, began rigorously testing Commercial Off-the-Shelf and Government Off-the-Shelf (COTS/GOTS) equipment for effectiveness in the general aviation environment in conjunction with controlled laboratory tests using next generation human portable devices.  Focusing on international general aviation (IGA) applications, the testing was conducted at Andrews AFB in March-June 2008, with a final test report expected in August 2008.  Five test sessions were conducted at Andrews AFB to baseline the performance of currently-deployed systems for scanning of small, medium, and large IGA aircraft, to assess whether any CBP operational procedure changes could enhance performance, and to evaluate performance of other human-portable scanning equipment to support CBP operations.  Test results will be utilized in preparing a Joint Assessment for the Secretary of Homeland Security, and will feed subsequent research and development efforts, as appropriate.

Small maritime craft represent another pathway that could be exploited by terrorists who seek to smuggle illicit nuclear or radioactive material and weapons into the United States.  DNDO has collaborated with the USCG, CBP, and other agencies to develop the recently approved DHS Small Vessel Security Strategy (SVSS); DNDO's small maritime craft initiatives are well-aligned with the broader Small Vessel Security Strategy, which addresses much more that radiological and nuclear threats.  DNDO is partnering with Federal, State, and local agencies to create a layered, "defense-in-depth" maritime preventive radiological/nuclear detection (PRND) Program to address a portion of this vulnerability through Maritime Program Assistance (PA). As part of the Maritime PA, DNDO actively engages select high-risk ports and neighboring regions to increase awareness and assist Federal, State, and local agencies as they establish an effective maritime PRND Program.  Assistance is provided in the form of a series of facilitated discussions with the maritime stakeholders to develop a strategy and implementation plan.  We also work closely with the USCG to support and enhance their maritime radiation detection program.  Through joint acquisitions, every Coast Guard boarding team is now equipped with radiation detection equipment.  Coast Guard needs are being factored into the development of next-generation nuclear detection systems.

DNDO initiated the West Coast Maritime PRND Pilot in the fourth quarter of FY 2007.  This 3-year pilot is evaluating the effectiveness of regional maritime PRND programs in addressing the small vessel threat.  The activities of this pilot will allow DNDO to gather lessons learned to provide recommendations for future, wider-scale deployments by Federal, State, and local entities.  The pilot will be conducted in the Puget Sound, Washington, and San Diego, California regions and is further supported by the maritime component of the Securing the Cities (STC) initiative in New York City. The pilot will design, field, and evaluate a radiation detection architecture (specific to each selected region) that reduces the risk of rad/nuc threats that could be illicitly transported on recreational craft or small commercial vessels. The project aims to develop rad/nuc detection capabilities for public safety forces for use during routine public safety and enforcement operations.

To address the security of our Nation's many miles of land border between official POEs, DNDO and CBP have been cooperatively conducting studies and examining options for deploying enhanced radiation detection capability to the U.S. border enforcement community that is focused on those areas of the land border between the ports of entry (the non-POE land border). Currently, DNDO is working with CBP to conduct field evaluations of Personal Radiation Detectors (PRDs). Based on these field evaluations, DNDO and CBP will determine the feasibility and costs of equipping 21 Border Patrol sectors along the northern and southern borders. No decisions have yet been made, and recommendations for deployments (if any are found to be feasible) will be based on a step-by-step assessment of lessons learned from the field evaluations. Compatibility with Border Patrol operations will be a key criterion, since the operational environment presents unique challenges and is very different from that experienced at ports of entry.

DNDO continues to work with Federal, State, and local partners to develop PRND capabilities and enhance opportunities to detect illicit materials or devices before they are used by an adversary. To accomplish this, DNDO conducts targeted outreach to raise awareness of the rad/nuc threat and works with FEMA's National Preparedness Directorate (NPD) to include PRND-specific language in the annual DHS grant guidance. To supplement the equipment purchased using DHS grant funds, DNDO continues to develop programs and products to assist State and local communities in planning, organizing, equipping, training, and exercising PRND capabilities. To create these programs and products, DNDO draws on the vast experience of the over fifty stakeholders from twenty-five States that participate in the DNDO State and Local Stakeholder Working Group (SLSWG) meetings.

An example of these products is the PRND Program Assistance. DNDO actively engages select States to increase awareness and assist Federal, State, and local agencies as they establish an effective Statewide PRND Program. Assistance is provided in the form of a series of facilitated discussions with State and local stakeholders to develop a strategy and implementation plan. The first delivery of this effort recently concluded in Florida. Through this effort, Florida established a state working group under their Domestic Security Oversight Committee to support the State wide coordination of PRND activities. With Florida's activities well underway, the program assistance efforts are beginning in California.

Building on the relationship we have fostered with State and local agencies, we are implementing interior detection programs and we are learning many lessons from our pilot activities in the New York City (NYC) region through the Securing the Cities (STC) Initiative. Separate from cargo and port security, these lessons provide examples of how best to broadly integrate detection and interdiction capabilities within a major urban area. In FY 2009, DNDO will complete the development and documentation of deployments to the NYC region. Additional DNDO activities will focus on the completion and implementation of a capability for detection system supportability. By August of this year, DNDO will conduct an assessment of the STC business model to determine its applicability in other urban areas.

Similarly, under the FY 2006 Homeland Security Appropriations, DNDO began the Southeast Transportation Corridor Pilot to look at the feasibility of incorporating preventive detection activities into commercial vehicle inspection operations. This pilot program involves nine States and the District of Columbia, incorporating both detection operations at fixed weigh stations and mobile detection operations for use in road-side inspection activities. This pilot program is culminating in a full-scale exercise involving all the member states and will provide a basis for recommendations for a national deployment strategy for commercial vehicle inspection activities.

**<u>International Cooperation</u>**

Although most international cooperation on nuclear detection is within the purview of other agencies, especially the Departments of Defense, Energy, and State, DNDO has participated in selected international engagements. One example that has an obvious close linkage with the domestic detection mission is cooperation with Canada and Mexico. The Security and Prosperity Partnership (SPP) allows DNDO to work with Canada and Mexico to develop a robust regional "North America" rad/nuc detection architecture. Through the framework of international outreach efforts, DNDO, in conjunction with other agencies involved in international work, will continue to promote the notion of regional architectures (North America being only one example of a possible regional architecture) to further enhance our combined rad/nuc detection capabilities.

During the past year, DNDO has been involved with activities to further expand partnerships under the SPP. We hosted a 3-day Detection workshop with Canada in May 2008 to share information and begin discussions on future areas of interest where collaboration is desired from each country

The Global Initiative to Combat Nuclear Terrorism (GI) was jointly approved by President Bush and President Putin in July 2006 to build the capacity of willing partner nations to combat the global threat of nuclear terrorism. The GI builds on the legal foundation of UNSCs 1540, 1373, and the Nuclear Terrorism Convention and seeks to implement them by bringing together committed international partners to build and exercise their capabilities to prevent, protect, and respond to the threat of nuclear terrorism. Currently, 75 partner nations have joined the initiative. One of the GI principles is specifically related to our objectives regarding the Global Nuclear Detection Architecture: 'Improve the ability to detect nuclear and other radioactive materials and substances in order to prevent illicit trafficking in such materials and substances, to include cooperation in the research and development of national detection capabilities that would be interoperable.'

Within the framework of the GI, the DNDO hosted a workshop in the Spring of 2008 to work with foreign counterparts to jointly develop model guidelines for a global rad/nuc detection architecture that will focus on all the layers and associated pathways: POEs; air, land, and maritime pathways; and interior countermeasures. The model guidelines are currently being drafted and will serve as a template for an integrated defense-in-depth strategy, should nations or regions decide to develop or strengthen their nuclear detection capabilities. The document will build on existing international (for example, International Atomic Energy Agency, World Customs Organization) documents and publications already developed for various components of the architecture.

## Conclusion

Over the long term, the architectural vision that the architecture is evolving toward can be characterized by several common themes that apply across all layers. In every layer we will seek to increase detection coverage and capability, i.e., our ability to detect the full range of radiological/nuclear threats in the wide variety of settings where threats might be encountered. In addition, we will perform research, development, testing and evaluation to make those detection capabilities less costly, more reliable and easier to use. We will also bring additional techniques into the detection toolkit to reduce or eliminate remaining vulnerabilities. Sensors, responders, intelligence analysts, radiological/nuclear experts, law enforcement, emergency responders, security personnel and even the general public will become more integrated and have the right information at the right time to support their efforts. The envisioned architecture incorporates education, training and outreach to raise awareness at all levels of government and law enforcement. Lastly, the distribution of detection capabilities will be widespread and balanced across the layers of the architecture. It will cover all modes of transport and all areas of the world with special emphasis on areas of elevated risk. The deployments will also be more agile, unpredictable and responsive to changing information and evolving adversaries so that any attempt to transport radiological/nuclear weapons or material runs a definite risk of discovery and interdiction. In this Global Nuclear Detection Architecture of the future, detection will combine with prevention, protection and response to significantly reduce the risk to the Nation and to the world from radiological or nuclear terrorism.

This concludes our prepared statement. Chairman Lieberman, Ranking Member Collins, and Members of the Committee, we thank you for your attention and will be happy to answer any questions that you may have.