The Nuclear and Radiological Threat: Securing the Global Supply Chain

Opening Statement

of

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Introduction

Good morning, Chairman Coleman, Ranking Member Levin and distinguished members of the subcommittee. I am Vayl Oxford, the Director of the Domestic Nuclear Detection Office (DNDO), and it is my pleasure to come before you today to discuss how we are responding to the threat of nuclear or radiological terrorism. I would like to thank the committee for the opportunity to share the progress we are making at DNDO and within the Department of Homeland Security (DHS).

Today, I will discuss several topics related to the use of technology to detect nuclear and radiological materials that could be used in a terrorist attack. I will review DNDO accomplishments in the past year, some of our program priorities for the upcoming years, and key, long-term challenges that we face. I will specifically touch upon the progress we have made with Customs and Border Protection (CBP) regarding the deployment of Radiation Portal Monitors (RPMs) at U.S. ports of entry (POEs), and how DNDO, and DHS as a whole, is considering innovative ideas like the Integrated Container Inspection System, or ICIS, which is being piloted at the Hong Kong Modern Terminal.

Before describing our efforts, I would like to point out that protecting the United States from nuclear threats is a job that extends beyond the work of DHS, and I would like to thank our partners, in particular the Department of Energy (DOE) and CBP, who are here with me today, as well as the Departments of Defense (DOD) and State, the Federal Bureau of Investigation (FBI), and the Nuclear Regulatory Commission (NRC) for their tireless dedication to this mission and for their contributions to our interagency office.

DNDO Founding, Accomplishments, and the Road Ahead

Combating the threat of catastrophic destruction posed by terrorists possessing nuclear or radiological weapons is one of the most critical priorities of not only DHS, but the U.S. Government. In order to integrate the Department's efforts against this threat under a singular direction, as well as coordinate these efforts with relevant partners across the government, Secretary Chertoff provided notification, in accord with Section 872 of the Homeland Security Act, of his

intent to establish the DNDO to the Senate Committee on Homeland Security and Government Affairs on April 13, 2005.

On April 15, 2005, the President signed a joint presidential directive NSPD-43/HSPD-14, "Domestic Nuclear Detection," establishing the office. DNDO was assigned the responsibility to direct nuclear and radiological detection technology development programs, and serve as the focal point of all radiological detection research and development collaboration between DHS, DOE, and other related Federal agencies. Full-time detailees from these agencies have since solidified our working relationship through their participation in all aspects of the DNDO mission.

In the short time since its founding, the DNDO has taken major steps towards achieving its stated mission. We completed the first ever global nuclear detection architecture analysis that identified vulnerabilities and priority initiatives across Federal, State, and local governments. The architecture study was completed four months ahead of schedule and briefed to partner agencies and the White House in October and November of 2005. This architecture effort was funded and led by DNDO, but involved considerable interagency participation to deliver a consensus strategy to be implemented across the Federal government.

It should be noted that the DNDO will not be responsible for implementing all, or even most, elements of the proposed architecture. We are responsible for implementing domestic components, but will work with other agencies, to include DOD, DOE, State, and the Department of Justice, to ensure the implementation of the entire architecture. In particular, the DNDO has been working with the DOE in the development of the international portion of the global architecture, which incorporates DOE programs such as Second Line of Defense. We are also in ongoing discussions about how next-generation detectors developed by DNDO may be deployed through the Megaports Initiative. As previously mentioned, full-time detailees from agencies such as DOE enable us to maintain an open and productive dialogue with our partners so that we may make strides towards the complete implementation of the proposed architecture.

Other accomplishments include our acceleration of several technology development programs. We have completed the initial engineering development phase of the Advanced Spectroscopic Portal, or

ASP, program. This system development and acquisition program is improving current generation radiation portal monitors with the ability not only to detect the presence of radiation, but to identify the materials causing the alarms so that we can dismiss non-threatening sources. This enhanced capability will provide significant improvement for CBP secondary inspection operations, as well as greatly reduce secondary referral rates when operated as a means of primary inspection. Last fall, these engineering development programs culminated in the first ever high fidelity test and evaluation campaign to measure the true improvement in performance provided by these next-generation systems. The test data collected is now being used to support the selection of up to five vendors that will begin low-rate initial production, or LRIP. Additionally, these vendors will continue the development of the technology so we can deliver enhanced capabilities and additional design variants for unique operational venues. Twenty-four of the ASP LRIP units will be delivered to CBP for operational test and evaluation in the fall of this year, with full-rate production expected to begin in early 2007.

We have recently begun the Cargo Advanced Automated Radiography System, or CAARS, development program to deliver imaging systems that will automatically detect, within cargo, high-density material that could be used to shield threat materials from detection by radiation portal systems like ASP. The automated image processing techniques envisioned for CAARS will also substantially improve throughput rates over current generation radiography systems. These improved throughput rates will, in turn, enable CBP and other operators to effectively scan a much higher portion of cargo. The DNDO vision is to ultimately deploy ASP and CAARS systems together to ensure our ability to detect either unshielded or shielded materials across the entire threat spectrum.

While cargo security remains one of our top priorities, the DNDO is also taking steps to improve nuclear detection capabilities within our Nation's borders. We have launched the Southeast Transportation Corridor Pilot program to deploy radiation detectors to truck weigh stations and other sites. These deployments will be at locations agreed to by our regional partners in accordance with the domestic detection architecture developed by the DNDO. Included in the pilot program will be the necessary training, technical reachback and operational protocols to ensure that detection

technology is being operated properly and that alarms are escalated as appropriate. I will speak more about this alarm escalation process shortly.

We are also launching a "Securing the Cities" initiative aimed at enhancing protection and response capabilities in and around the Nation's highest risk urban areas. Starting with New York City, we will work with State and local officials to develop urban and regional deployment and operations strategies, identify appropriate detection equipment, establish the necessary support infrastructure, and develop incident management protocols to respond to a small scale "dirty bomb" attack.

These two initiatives, when integrated, form the basis for the DNDO vision for an interior layer nuclear detection framework. As these initiatives mature, the lessons learned will be exported to other regions and cities to enhance our overall preparedness against nuclear and radiological threats. Moreover, we offer assistance to State and local officials developing grant applications, ensuring that short-term detection pilots support long-term capabilities.

The DNDO plans to support the training of approximately 1,500 State and local operators in the use of rad/nuc detection equipment through fiscal year 2007. Our collaborative partnership with the DHS Office of Grants and Training allows us to administer funds and oversee the design, delivery, evaluation, and continual improvement of preventative rad/nuc training curriculum. Because of the varying levels of resident expertise encountered in State and local venues, the DNDO has developed a modular training curriculum that can be easily and rapidly tailored to the appropriate audience. The training modules span a range of topics, and currently include modules that cover "radiation 101," nuclear threat awareness, response protocols and specific equipment operation. As State and local operations increase, the DNDO will continue to work with the DHS Office of Grants and Training to deliver additional training options, such as "radiation detection for commercial vehicle inspection" or "radiation detection surge programs."

The DNDO is also working with the State and local community, as well as nuclear experts in the National Labs, to establish regional technical reachback capabilities to support their operations. As alarms escalate, this program will provide technical expertise to operators to ensure that alarms are resolved properly or, if necessary, that alarms are elevated to the appropriate response assets. As

part of this support effort, the DNDO recently completed the development of a comprehensive U.S. Government process for alarm resolution that brings our procedures in line with the drastically altered security environment that we now face. This new alarm resolution process represents the first restructuring of the Federal alarm resolution and response protocols in over a decade.

Even with all of the accomplishments I have outlined, there are still key, long-term challenges and vulnerabilities in our detection architecture that require a well-supported research and development program. These challenges include detecting threat materials from greater distances, in highly cluttered backgrounds, or in the presence of shielding and masking materials. We are launching initiatives to develop technologies to meet these challenges, as well as commencing a broad basic research program across private industry, National Labs, and academia to stimulate the entire field of nuclear detection sciences.

RPM Deployment Strategy

This committee has expressed particular interest in the progress of RPM deployment at U.S. POEs. I would like to take the opportunity to address this topic in detail.

In its report entitled, "Combating Nuclear Smuggling: DHS Has Made Progress Deploying Radiation Detection Equipment at U.S. Ports of Entry, but Concerns Remain," the Government Accountability Office (GAO) recommended that the "the Secretary of Homeland Security working with the Director of DNDO, in concert with CBP and Pacific Northwest National Laboratory, or PNNL, devise a plan to close the gap between the current deployment rate and the rate to complete deployments by September 2009." DNDO concurred with this recommendation and now proposes a deployment strategy that will result in screening 98% of all containerized cargo crossing the southern border by fiscal year 2006 and at seaports by fiscal year 2007. This strategy will result in full coverage of all incoming containerized cargo by the end of fiscal year 2011.

In this same report, the GAO also recommended that "once cost and capabilities of advanced technology portal monitors are well understood, and before any new equipment is purchased, the Secretary of Homeland Security will work with the Director, DNDO to analyze the benefits and

costs of deploying advanced portal monitors." Again, we fully concur with the need for a deliberate process to ensure that public funds are used in a responsible manner, and that ASP systems, which do have a higher initial procurement cost, are deployed in a cost-effective manner. DNDO testing of ASP systems at the Nevada Test Site has since validated the systems' spectroscopic capabilities when compared with plastic-based systems and demonstrated, in some cases, a four-fold improvement in performance against threat-like objects and a 60% reduction in nuisance alarms generated by naturally occurring radioactive materials (NORM).

This information is now guiding a joint DNDO-CBP analysis in support of a revised RPM deployment strategy that is an optimized mix of current- and next-generation technologies, balancing our need for better capability with coverage concerns and their associated costs. This new joint deployment strategy is predicated on placing ASP systems at the highest throughput ports, where reductions to secondary inspection rates will have the greatest benefit. Current-generation systems will continue to be deployed to lower volume ports, where operations can be easily sustained while still meeting detection threshold requirements. Initial results of this analysis support the decision to acquire over 600 detection units in fiscal years 2006 and 2007, including 184 current-generation RPMs and 106 next-generation portal systems this year, and 131 current-generation and 142 next-generation systems in fiscal year 2007.

As I have mentioned, the DNDO relies heavily on the ability to obtain high fidelity, defendable test data in support of development, acquisition, and deployment decisions. DNDO testing activities are conducted throughout the product development process, and involve the National Labs, private industry and academia. The construction of the DNDO Radiological and Nuclear Countermeasures Test and Evaluation Complex (Rad/NucCTEC) is expected to be complete this September and will offer the opportunity for further high-fidelity test and evaluation. The facility will provide the capability for handling of special nuclear material, or SNM, for the purpose of testing technologies against actual samples of materials that could be readily used in a nuclear attack. Until the construction of this facility, no location existed which allowed access to SNM while maintaining the flexibility to place these materials into relevant threat scenarios and cargo configurations. Through the Rad/NucCTEC, the DNDO will be able to gather performance data and conduct independent evaluations of prototypes and products in support of a fair and open acquisition process.

It is our belief that this testing environment, one which provides access to realistic threat scenarios in the spirit of independent assessment, provides a unique opportunity. While there are radiological and nuclear detection technology test activities at PNNL, Sandia, and Brookhaven National Laboratories, none currently have access to the quantities of materials available at the Rad/NucCTEC. The National Labs certainly possess other testing capabilities, such as the environmental test chambers at Oak Ridge National Laboratory. Therefore, the DNDO hopes to leverage, not duplicate these capabilities. Experts from the National Labs and the National Institute of Standards and Technology have and hopefully will continue to be members of the DNDO test teams. They help us scope our tests, conduct data analysis, and provide support personnel for operational evaluations at the DHS Science & Technology Countermeasures Test Beds. They have also worked with us on pilot deployments for CBP, as is the case with PNNL.

Integrated Cargo Inspection

While we have made great progress in the first year of our existence, including crafting a comprehensive strategy for technology development and deployment, the DNDO continues to aggressively seek innovative approaches to nuclear detection. Members of this committee traveled to Hong Kong this past December and were able to see a pilot project at the Hong Kong Modern Terminal called the Integrated Container Inspection System, or ICIS.

I would like to applaud the private sector for creating new concepts for screening international containers like ICIS. Private sector container screening can be compatible with the U.S. Government's layered security strategy, and is another tool to further our ability to identify and address risks in an expedited manner. An integrated cargo inspection system, one that combines targeting, passive detection, radiographic imaging and information analysis would be a robust solution to the nuclear and radiological detection challenges that we face.

The ICIS pilot at Hong Kong Modern Terminal demonstrates potential interest in private sector acquisition and operations of container screening technologies. It is a model for comprehensive passive and active inspection, as well as a model for public-private partnership. However, ICIS, as

deployed, is not an operational system. It utilizes currently available technology that is not optimized for radiation detection. DHS has sent teams to observe the ICIS pilot and determined that the technology they have used has potential, but still faces significant limitations.

If ICIS, as it exists, is not a complete solution for nuclear detection, then what type of system do we think we need? The DNDO certainly favors an integrated system approach. At international seaports, every cargo container should be both passively and radiographically scanned. This would enable us to detect unshielded or lightly shielded materials with current and next-generation RPMs like ASP, as well as automatically detect highly-shielded threat materials using a radiographic scanner like CAARS. Detector data should be analyzed by the U.S. Government prior to cargo transit, with the CBP Automated Targeting System (ATS), manifest and detector data integrated for enhanced targeting capability. Additional targeted inspection utilizing mobile advanced RPMs with radiography systems could be performed upon arrival at a POE. Proposed approaches could include public-private partnerships with the mandate that the U.S. Government would receive all raw data streams.

As we strive towards the goal of full coverage, we must not lose sight of our ultimate goal – protecting this Nation against nuclear and radiological terrorism. Private sector screening of international cargo could further enable DHS' ability to resolve security concerns related to identified high risk containers. However, such efforts must supplement, not replace, the need for advance data reporting and targeted inspection at our POEs.

Conclusion

In conclusion, the DNDO is taking a comprehensive approach to addressing the threat posed by a terrorist nuclear attack. This approach, which begins with focused research and development programs that culminate in high fidelity test and evaluation campaigns, provides the basis for the Department to make informed and justifiable acquisition decisions. Equally important is the recognition on behalf of DNDO that the successful deployment of these technologies must be done as part of a larger strategy, one that extends to deployments executed by other agencies. Ultimately,

all of these systems must be connected and work within an environment that responds to information obtained from intelligence, counterterrorism, and law enforcement communities.

I am proud to have shared with you today how DNDO and its partners are continuing to make progress against this very real threat. I look forward to working with you on this subcommittee in an ongoing effort to protect the Nation.

This concludes my prepared statement. With the committee's permission, I request my formal statement be submitted for the record. Chairman, Senator Levin, and Members of the Subcommittee, I thank you for your attention and will be happy to answer any questions you may have.