

**Opening Statement
Of
Dr. William K. Hagan
Deputy Director (Acting), Domestic Nuclear Detection Office
Department of Homeland Security**

**Before the House Committee on Science and Technology
Subcommittee on Investigations and Oversight**

**"The Science of Security: Lessons Learned in Developing, Testing, and Operating
Advanced Radiation Monitors"**

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Introduction:

Good morning Chairman Miller, Ranking Member Broun, and distinguished members of the Subcommittee. As Acting Deputy Director of the Domestic Nuclear Detection Office (DNDO) at the Department of Homeland Security (DHS), I would like to thank the Committee for the opportunity to share lessons learned and progress to date on our Advanced Spectroscopic Portal (ASP) program. I would also like to thank the Committee for its support of DNDO's mission to reduce the risk of radiological and nuclear terrorism to the Nation.

DNDO was established to improve the Nation's capability to detect and report attempts to import, possess, store, develop, or transport nuclear or radiological material for use against the Nation, and to further enhance this capability over time. To that end, our work is guided by our development of a global nuclear detection architecture (GNDA). DNDO has developed a time-phased, multi-layered, defense-in-depth GNDA that is predicated on the understanding that no single layer of defense can detect all radiological or and nuclear (rad/nuc) threats. For this reason, the GNDA provides multiple detection and interdiction opportunities overseas, at our borders, and within the United States to effectively increase the overall probability of system success. DNDO has worked with intra- and inter-agency partners to develop time-phased strategies and plans for improving the probability of detecting and interdicting nuclear threats. DNDO will continue to enhance the GNDA over time by developing better detection technologies, working with our operational partners to improve concepts of operations (CONOPs), enabling real-time reporting of detection events, and supporting effective response to real threats.

My testimony today will include a status update and lessons learned in DNDO's efforts to address one aspect of the GNDA – scanning cargo containers at ports of entry. Specifically, I will focus on the ASP program – a program to improve the detectors used to perform this task.

Role of Container Scanning and ASP in the GNDA:

The United States border is the first layer within the GNDA where the United States has full control over detection and interdiction. As such, considerable effort and resources have been placed at this layer to provide comprehensive radiological and nuclear detection capabilities, particularly at ports of entry (POEs). After 9/11, considerable concern was raised about the possibility that terrorists could use the enormous volume of cargo flowing into the United States as a pathway for bringing in nuclear material or a nuclear weapon. By far, the largest mode for incoming cargo is maritime shipping containers, with approximately 11 million containers coming into the country every year. Additionally, in the Security and Accountability for Every (SAFE) Port Act of 2006, Congress mandated that all containers coming in through the top 22 ports, by volume, be scanned for radiation by the end of 2007.

A key consideration in rad/nuc detection is the ability to effectively detect threats without impeding the flow of legitimate trade and travel across the border. United States Customs and Border Protection (CBP) currently scans cargo entering at our Nation's POEs using polyvinyl toluene (PVT)-based radiation portal monitors (RPMs) that can detect radiation, but cannot distinguish between threat materials and naturally occurring radioactive material (NORM), such as kitty litter and ceramic tiles. Narrowing down alarms to just those for dangerous materials is especially important for POEs that have a high volume of containers, or those that see a high rate of NORM. To address this limitation, DNDO is developing next-generation technology—the ASP program. The ASPs have shown significantly improved capability to distinguish rad/nuc threats from non-threats over the handheld instruments currently used in secondary screening. Thus, the introduction of ASP systems is expected to not only reduce the number of unnecessary referrals and false positives in primary but increase the probability of detecting dangerous materials in secondary.

As you know, DNDO initiated the ASP program in 2006, building on previous work within CBP and the Science and Technology Directorate. ASP systems are the next

generation of radiation portal monitors. ASP units are now being developed by two separate vendors. These units have been subjected to rigorous tests and both systems will complete several rounds of performance testing and field validation at POEs. Following these performance tests, both systems will complete independent operational testing and evaluation conducted by the DHS Science and Technology Directorate's Operational Testing Authority. Test data will be analyzed and provided in support of the Secretary's Certification decision. DNDO is also engaged with the National Academy of Sciences (NAS) to allow them to review ASP testing and inform the certification process, as required in the FY 2008 and 2009 Homeland Security Appropriations bills. Indeed, in its most recent report on ASP testing, the Government Accountability Office (GAO) acknowledged the many enhancements and lessons that DNDO has incorporated into its testing programs.

Reviews to date and lessons learned:

Since 2006, the ASP program has undergone extensive review from outside agencies, including the GAO, an Independent Review Team (IRT) established by the previous DHS Secretary, and, most recently, the National Academy of Sciences. We have taken each review seriously, valued the recommendations that have been provided, and, where we felt appropriate, we have incorporated their recommendations into the next stages of the program.

The first reviews conducted by the GAO of the ASP program focused on testing conducted in 2005 as part of the original ASP vendor selection and the initial cost-benefit analysis used to evaluate potential deployment options for ASP systems. In its report, released in September 2006, GAO questioned the methods used by DNDO to quantify performance capabilities of new systems, and insisted that ASP performance be evaluated against system requirements prior to full scale deployment. DNDO concurred with the need for additional testing prior to full scale deployments, which were underway prior to the release of GAO's report. These tests were conducted throughout 2007 and focused

specifically on evaluating the performance of ASP systems in a number of testing environments.

In September 2007, GAO recommended that DHS establish an independent body to conduct additional testing of ASP systems, which DNDO agreed to, launching the ASP-Independent Review Team (IRT), a team of independent experts, drawn from a wide range of institutions and backgrounds. The ASP-IRT Report, delivered in February 2008, provides a valuable independent assessment of the ASP program, and served as an important source of information, albeit based on the data that was available at the time.

In addition to the reviews of 2007 testing, at the conclusion of initial “field validation” testing in 2007, CBP identified a number of functional improvements, un-related to detector performance, that required modifications to ASP systems prior to deployment. DNDO postponed efforts to seek certification at that time, initiated new efforts to develop these requested changes , and conducted a new series of tests in 2008 and early 2009 to ensure that these changes did not detract from detector performance.

The 2008-2009 test campaign transitions the program from developmental to functionality and performance testing, culminating in full operational tests. This testing includes:

1. System Qualification Testing, designed to demonstrate that ASP units are manufactured in accordance with processes and controls that meet the specified design requirements;
2. Performance Testing at the Nevada Test Site (NTS), designed to evaluate ASP, PVT, and radioisotope identification devices (RIID) detection and identification performance against controlled, realistic threat materials, shielding and masking scenarios;
3. Integration Testing, designed to determine whether the ASP systems are capable of operating and interfacing with the other equipment found in operational settings;

4. Field Validation Testing, designed to exercise the ASP in a stream of commerce environment at POEs;
5. Operational Test and Evaluation (OT&E), designed to measure the operational effectiveness and suitability of ASP. The OT&E will be independently conducted by the DHS Science and Technology Directorate (S&T).

Recently, the GAO released its latest report, focusing on the testing conducted in 2008 and 2009. GAO acknowledged improvements in ASP testing, but raised some concerns. DNDO agrees that analysis and review of test data is necessary. DNDO plans to continue study the results of testing as the ASP program progresses. However, DNDO believes that the data analysis performed to date and the anticipated data from ongoing testing will be sufficient to inform an ASP certification decision in the future.

In addition to the GAO's reviews, DNDO and CBP have provided NAS with regular testing updates. Recently, the NAS delivered an interim report to the Department and the Appropriations Committees. Like the NAS, DNDO sees the intrinsic value of continued testing and incremental deployment of ASP systems. However, DNDO must balance the need to better understand a complex system like ASP and the need to further reduce the risk of certain significant vulnerabilities and operational burdens. DNDO believes that the criteria outlined for certification are a sufficient threshold for determining when we have reached the point where deployment should begin.

Ultimately, these reviews provide for a valuable external assessment of the ASP program. It is only through initial deployments that we will continue to learn more about the performance of these systems, and most rapidly bring about the improvements that are needed to address current limitations. ASP systems have been under review and evaluation for over three years now, and, while further improvements will always be possible, we should not delay the implementation of substantially improved capabilities.

Acquisition lessons learned and changes made in response:

DNDO has taken a number of steps to reform processes to ensure the success of ASP, as well as other development and acquisition programs. At the same time, these reforms are accompanied by a number of similar improvements to DHS-wide program management processes.

With regard to testing, DNDO has taken a number of steps to improve internal procedures based on lessons learned from earlier tests.

One of our most fundamental improvements has been through the standardized implementation of DNDO Operating Instruction 1, "Test Event Planning." This detailed instruction lays out a six-milestone process that ensures that test planning is done openly, that partner inputs are included, and that test events are designed to provide the data required to meet the objectives of the test, and ultimately to help make programmatic decisions.

We have also taken considerable steps to ensure that any ASP testing is responsive not just to DNDO requirements and objectives, but to all DHS partners. Prior to the 2008-2009 testing, DHS created a test planning working group that included DNDO, CBP, the DHS Operational Testing Authority (OTA), the Office of the Under Secretary for Management (USM), and the National Laboratories. Collectively, this group laid out the test campaign and assigned responsibilities for each test event to respective components.

Finally, in the 2008-2009 ASP test campaign, based on lessons learned in the 2007 test campaign series, we instituted strict entrance and exit criteria for each of the test events. These criteria were developed long before testing began, and were developed jointly with our operational partner, CBP. This has given us confidence that as the ASP systems have continued through this series of test events, requirements are met prior to completion.

DNDO has also made a number of program management changes based on lessons learned throughout the program. In late 2008, DHS decided against exercising the next

contract option for one of three ASP vendors. This decision reduced costs for carrying forward multiple, parallel development efforts.

Finally, DNDO and the ASP program have benefited from a number of DHS-wide improvements to program management. DNDO has adopted Management Directive (MD) 102-01, which outlines the acquisition management process for DHS programs. ASP program plans have been adapted to be consistent with the rigorous process outlined in the directive. This will further ensure that any eventual certification and acquisition decisions are consistent with DHS priorities and made with a strong acquisition management foundation.

There is an important distinction between two key milestones for the ASP program – Secretarial certification and the MD 102-01 milestone decision for purchase and deployment of ASP. The former is a rather loosely defined milestone, which we have clarified by defining a “significant increase in operational effectiveness,” requiring that the Secretary formally state that she believes the ASP system is “better than” the current system. The latter is a very well defined milestone that was developed for all large programs within the Department of Homeland Security. Items such as mission needs, operational requirements, analysis of alternatives, etc, are part of the MD 102-01 process. No ASP production units can be purchased and deployed without successfully navigating the MD 102-01 process. The Secretarial certification requirement is in addition to and in advance of the MD 102-01 deployment decision.

Together, the lessons learned in testing and program management, along with the introduction and adherence to MD 102-01 have significantly improved the ASP program. At the same time, it is important to note that these lessons learned have not only benefited the ASP program; they are being applied across DHS.

ASP Path Forward:

The plans and procedures in place for the ASP program provide a sound path forward for ASP certification and future acquisition decisions. The current path to certification includes testing, accompanied by the analysis of results, to ensure that Secretary Napolitano has sufficient information for ASP certification. ASP systems have been under review and evaluation for over three years now, and, while further improvements will always be possible, a certification decision will determine whether or not the systems address increase the probability of detecting dangerous materials while minimizing the operational burdens.

ASP was designed to improve capabilities in both primary and secondary inspections. For primary applications, we have defined a “significant increase in operational effectiveness” as being a quantified reduction in unwanted referrals to secondary inspection, while maintaining similar or better sensitivity in detecting materials of concern. Ultimately, the degree to which ASP systems meet this objective is driven by sensitivity thresholds at which the systems will be operated, similar to the threshold used for current PVT systems. Therefore, the advantage in primary can be viewed as an improvement in efficiency of operations (less unwanted referrals), while maintaining the same or better detection efficiency. The relative degree to which we realize these benefits with respect to the current systems will vary by port, depending on the operational thresholds at which the current PVT systems are set.

The evaluation of ASP systems in secondary inspection is more direct. The ability of ASP systems to identify and resolve the source of radiation is directly compared to the ability of current capabilities to perform the same functions. In this instance, a “significant increase in operational effectiveness” is defined as a quantified improvement in the ability to identify materials of concern.

Both of these definitions were developed through coordination between DNDO, CBP, and USM. This definition has been approved by DHS senior leaders and has served as the guide for developing test campaigns to meet these test objectives. Again, because of the rigor that has gone in to developing and quantifying these improvements, we are

seeking to remove ambiguity in the evaluation process, and ensure that any certification and acquisition decisions are made consistent with DHS priorities and objectives.

Conclusion:

DNDO will continue to work with CBP and other partners within and beyond DHS to improve the Nation's ability to detect radiological and nuclear threats at our ports and borders. DHS is facing a challenge at our ports and borders as the Department balances facilitating the flow of goods and commerce with the need to sufficiently scan cargo for radiological or nuclear threats as it enters our Nation. As both the President and Secretary have said, the nation will need more technology to meet its security challenges and the technologies that DNDO is pursuing, of which ASP is but one example, are a critical component in addressing that challenge.

Our efforts to develop and evaluate ASP systems are sound. Current test results are capturing the benefits of ASP systems, and the reviews to date have provided a valuable assessment of the program and identified a number of key lessons learned.

I welcome and appreciate the Committee's active engagement with this program, and look forward to continuing our cooperation as we move forward together. Chairman Miller, Ranking Member Broun, and Members of the Subcommittee, I thank you for your attention and will be happy to answer any questions that you may have.