Opening Statement

Of

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Introduction

Good morning, Chairman Lieberman, Ranking Member Collins, and distinguished members of the Committee. I am Vayl Oxford, Director of the Domestic Nuclear Detection Office (DNDO), and I would like to thank the committee for the opportunity to discuss our systems acquisition process and two major programs. To date, our largest near-term development and acquisition programs have been for next-generation radiation portal monitors (RPMs), through our Advanced Spectroscopic Portal (ASP) program, and the development of next-generation non-intrusive inspection systems (NII), through the Cargo Advanced Automated Radiography Systems (CAARS) program. Today, I would like to convey DNDO's progress on these programs as we continually strive to develop and procure technological solutions to more effectively detect illicit radiological and nuclear (rad/nuc) material, while integrating end-user requirements and conducting test and evaluation campaigns to ensure that equipment is suitable for operators and their missions.

ASP Systems Contracting and Procurement

The ASP program represents our next generation RPM technology that is currently being tested, prior to seeking certification from the Secretary of Homeland Security for full rate production. U.S. Customs and Border Protection (CBP) currently scans cargo entering at our Nation's ports of entry (POEs) using polyvinyl toluene (PVT)-based RPMs and adjudicates alarms by sending conveyances to a secondary inspection area and manually scanning them with a hand-held radioisotope identifier (RIID). Next generation technology will improve upon the capabilities of currently deployed PVT-RPMs by collecting spectroscopic data that is automatically analyzed to identify the isotopic content of the radioactive source. This isotopic information is the key to distinguishing between threat and innocent objects. This will be especially important for POEs that have a high volume of containers, or those that see a high rate of naturally occurring radioactive material. DNDO awarded contracts to Raytheon Company, Thermo Fisher Corporation, and Canberra Industries, Inc. for the development and production of ASP in July of 2006. ASP Engineering Development Models were developed for the purpose of the initial developmental test, and subsequently, Low Rate Initial Production Units were designed and built.

Testing and Certification of ASP

As part of the development and acquisition process, DNDO has undertaken a very rigorous test campaign to evaluate ASP systems. This campaign consisted of a broad range of test phases designed to evaluate ASP performance and operations. For test planning, execution, and analysis, we worked in coordination with subject matter experts from CBP, DOE, National Institutes of Standards and Technology, the Environmental Measurements Laboratory, Sandia National Laboratory, Pacific Northwest National Laboratory (PNNL), Los Alamos National Laboratory, the Applied Physics Laboratory of Johns Hopkins University, Brookhaven National Laboratory and National Security Technologies.

The current ASP test campaign transitions the program from developmental to functionality and performance testing which will provide data for an acquisition decision. Testing status is as follows:

(1) System Qualification Testing, designed to demonstrate that ASP units are manufactured in accordance with processes and controls that meet the specified design requirements, is complete;
(2) Performance Testing at the Nevada Test Site (NTS), designed to evaluate ASP, PVT, and RIID detection and identification performance against realistic threat materials, is complete;
(3) Integration Testing to determine whether the ASP systems are ready to deploy in an operational setting for secondary and primary deployment is nearly complete;
(4) Field Validation Testing to exercise the ASP in a stream of commerce environment at POEs is scheduled to be complete next month;
(5) Operational Test and Evaluation (OT&E) designed to measure the operational effectiveness and suitability of ASP will be independently conducted by the DHS Science and Technology Directorate (S&T) also next month.

In the Spring of 2008, a Memorandum of Understanding was signed by DNDO, CBP, S&T, and the DHS Management Directorate, outlining the roles and responsibilities for ASP testing. DHS leadership directed the DHS, S&T Director of T&E and Standards to be the ASP Director of OT&E with oversight responsibilities for operational ASP testing activities. The OT&E utilizes portions of data collected from performance testing conducted at NTS, integration testing

conducted at the PNNL Integration Laboratory, and field validation activities conducted at CBP POEs. Additional OT&E will be conducted with an additional set of suitability and effectiveness tests at the Field Validation site. OT&E of this nature for equipment prior to deployment is the first of its kind performed within the Department.

The Fiscal Year (FY) 2007 Homeland Security Appropriations Act (P.L. 109-295) required that the Secretary certify ASP system performance before DNDO commits to full-rate production and deployment. The language specifically stated, "That none of the funds appropriated under this heading shall be obligated for full scale procurement of Advanced Spectroscopic Portal Monitors until the Secretary of Homeland Security has certified through a report to the Committees on Appropriations of the Senate and the House of Representatives that a significant increase in operational effectiveness will be achieved." We have worked with our Departmental partners to define criteria that demonstrate a "significant increase in operational effectiveness" over the current systems for deployment of ASP in secondary and primary scanning applications.

In early FY 2008, the Secretary of Homeland Security decided to closely couple ASP certification with the larger production and deployment decision, representing Key Decision Point 3 in the DHS Investment Review Process. Under this process, field validation and operational suitability testing must signify not only that the next-generation ASP systems demonstrate significant improvement in operational effectiveness, but also that they fully meet the functional requirements of the mission as defined by the functionality matrix developed by CBP. Currently CBP and DNDO are collaborating on a Joint deployment Strategy which will identify the appropriate locations in which to deploy the ASP systems. DNDO will use a combination of cost-benefit analyses as well as demonstrated performance metrics, including data from the current test campaign, to assist in the Secretary's certification decision. Part of the certification process will also involve consulting with the National Academy of Sciences, as required in the FY 2008 Consolidated Appropriations Act. We are cooperating with the Government Accountability Office (GAO) and the National Academy to provide both groups with information and visibility into our testing processes and data collection and analysis.

In FY 2009, subsequent to Secretarial certification, DNDO working with CBP, would commence full rate production and deployment of the ASP cargo portal units, beginning with the highest priority POEs. DNDO will continue to work closely with CBP to execute a continuous improvement program as a means to provide for upgrades to the operational system, as needed.

CAARS and JINII

Another major development and acquisition program within DNDO is the CAARS program that was announced in October 2006, with awards to Science Applications International Corporation, American Science and Engineering, and L-3. CAARS systems, when deployed, will serve as a complementary technology to the ASP and PVT-based passive detection systems. CAARS will scan cargo containers or other conveyances of interest and provide an automated alert if a rad/nuc threat is found. Specifically, the technology that is under development will automatically distinguish between low density non-threat materials such as aluminum and steel, and higher density materials that indicate the possible presence of threat, such as uranium or plutonium, or threat-shielding materials such as lead or tungsten.

Consistent with any rigorous development and acquisition program, DNDO conducted system requirement reviews in November 2006 and preliminary design reviews in late May and June 2007 to assess the maturity of the CAARS technology. As a result, DNDO found that the technology was more difficult to implement than originally anticipated and determined that the technology should be demonstrated so that its full performance capability could be established prior to acquisition. It was also determined that the CAARS units, as currently designed, are too large and complex to be operationally effective. Finally, since 2006, there have been several technical advances in currently-deployed or soon-to-be-deployed NII systems that might provide some, but not all, of the desired capability. Accordingly, DNDO undertook a "course correction" in April 2008 and modified the three CAARS contracts to remove the "acquisition" component of the contracts, yet retain the demonstration and the test and evaluation (T&E) components of the contracts to allow collection of the required performance data.

As part of the course correction, the Joint Integrated Non-Intrusive Inspection (JINII) Program was established - "joint" because the project is a collaboration between DNDO and CBP, and

"integrated" because it seeks to combine the ability to detect both traditional contraband and high density material, including special nuclear material. The JINII program has two main components. First, a test and evaluation campaign will be performed with currently-deployed or soon-to-be-deployed NII systems to characterize their ability to detect shielded nuclear material through *manual* operator image interpretation. Simultaneously, a rapid research campaign will be performed to determine if simple methods are available to upgrade the currently deployed and soon-to–be-deployed NII systems to incrementally improve the capability to detect shielded nuclear material. Near-term upgrades could include methods to provide improvements in accuracy, sensitivity, automation, and throughput rate. As methods are found, they will be developed and tested by DNDO. DNDO is also working cooperatively with DHS Science and Technology in non radiological threat areas such as Non Intrusive detection for narcotics, explosives and contraband detection. This technology could be leveraged into future DHS S&T Research and Development Maritime and Air Cargo Non Intrusive Inspection programs.

Second, the JINII program will continue the CAARS program to demonstrate whether the systems *automatically* detect shielded nuclear material with higher sensitivity relative to current systems. The CAARS systems may have the capability to detect traditional contraband such as illicit narcotics and threat materials such as explosives. We note, however, that the detection of "traditional" contraband may not be as highly automated as the detection of high density materials. It is anticipated that searches for "traditional" contraband will continue to require operator image analysis.

With this two-pronged approach of demonstrating advanced concepts (i.e.., CAARS) and testing of potential near-term upgrades to existing capability, the JINII program will result in the development of systems with the capability to automatically detect shielded SNM. In developing and testing systems we will take full advantage of the significant amount of ongoing industrial R&D in this area. This strategy will result in the availability of integrated contraband and rad/nuc detection capability for effective and rapid introduction into CBP operations, as prescribed by the purpose of the JINII program.

Development and Acquisition Program Management

Our programs for detection of rad/nuc material in different environments with multiple operators must be designed and implemented dependent upon a broad range of factors. Thus, program management processes are tailored to fit the specific development needs and projected acquisition strategies for each piece of equipment. We work with subject matter experts and end-users to develop lists of technical standards and customer requirements against which we can evaluate operability and performance. Protocols for the development of the cutting edge rad/nuc detection capabilities such as those we are pursuing did not exist prior to DNDO's efforts and this has required us to foster relationships with other agencies and gather information about needs and standards that were not previously integrated. Along the way, DNDO has integrated lessons learned and best practices for collecting and documenting customer requirements, contracting for development of new technologies, developing and executing test and evaluation procedures, and making acquisition decisions. The course correction to the CAARS program is an example of how we make programmatic adjustments, when necessary, to ensure that operators will receive the best equipment as soon as possible to support their mission needs.

Conclusion

It is the intention of DNDO to continue to promote the development of emerging technologies and to rigorously test and evaluate equipment, in order to make procurement and acquisition decisions that will best address the detection requirements prescribed by the evolving Global Nuclear Detection Architecture. We work with our inter- and intra-agency partners to ensure that deployment and operability of our systems enhance security and efficiency without unnecessarily impeding legitimate traffic at the nation's borders.

We plan to work with the GAO and our customers to foster better understanding of our development, acquisition, and testing approaches and will continue to share results of our efforts with Congress. This concludes my prepared statement. With the committee's permission, I request my formal statement be submitted for the record. Chairman Lieberman, Ranking Member Collins, and members of the Committee, I thank you for your attention and will be happy to answer any questions you may have.

Advanced Spectroscopic Portal (ASP) Program Certification Process

EXISTING PERFORMANCE DATA

- Systems Qualification Testing (Feb 19 - Jul 10, 2007)
- Nevada Test Site Performance Testing (Feb 12 - Apr 5, 2007)
- New York Container Terminal Stream-of-Commerce Testing (Mar 19 - May 4, 2007)
- Deployment Readiness Testing at Pacific Northwest National Laboratory (331-G) (Mar 15 - Jul 3, 2007)
- Field Validation Testing (Jul 9 - Nov 1, 2007)

USER DEFINED OPERATIONAL SYSTEM REQUIREMENTS

CURRENT TESTING

System Qualification Testing (SQT)

Objective:
Evaluate system functionality against the performance specification

STATUS ✓ COMPLETED

331G Integration Testing

Objective:
Verify system performance in a simulated port of entry (POE) environment prior to field validation

STATUS UNDERWAY

NTS Performance Testing

Objective:
Re-verify/re-validate ASP performance for detection and identification of threats

STATUS ✓ COMPLETED

Operation Test and Evaluation (OT&E)

Objective:
Validate the operational performance (suitability) of ASP at POEs

STATUS FALL 2008

ASP Life Cycle Cost Estimate

COST-BENEFIT ANALYSIS (CBA)

Secretarial Certification of ASP

OUTSIDE REVIEW/ SUPPORT OF TESTING

- Multi-agency Subject Matter Expert Working Group (DNDO, DOE, CBP)
- Independent Review Team (IRT) Final Report
- National Academics of Science (NAS) Consultation
- DHS Deputy Secretary Operation Test and Evaluation (OT&E) Independent Support

Homeland Security

Domestic Nuclear Detection Office

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