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# COUNTERING THE NUCLEAR THREAT TO THE HOMELAND: PART I AND II

## HEARING

BEFORE THE

## SUBCOMMITTEE ON EMERGING THREATS, CYBERSECURITY, AND SCIENCE AND TECHNOLOGY

OF THE

## COMMITTEE ON HOMELAND SECURITY HOUSE OF REPRESENTATIVES

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# EVALUATING THE PROCURMENT OF RADIATION DETECTION TECHNOLOGIES PART I

**Wendesday, March 14, 2007**

U.S. HOUSE OF REPRESENTATIVES,
COMMITTEE ON HOMELAND SECURITY,
SUBCOMMITTEE ON EMERGING THREATS, CYBERSECURITY,
AND SCIENCE AND TECHNOLOGY,
*Washington, D.C.*

The subcommittee met, pursuant to call, at 2:27 p.m., in Room 1539, Longworth House Office Building, Hon. James Langevin [chairman of the subcommittee] presiding.

Present: Representatives Langevin, Christensen, Etheridge, Green, McCaul, and Lungren.

Mr. LANGEVIN. [Presiding.] The subcommittee will come to order.

The subcommittee is meeting today to receive testimony on "Countering the Nuclear Threat to the Homeland: Evaluating the Procurement of Radiation Detection Technologies."

I want to thank everyone for their patience. Unfortunately, the votes around here always throws a monkey-wrench into the schedule, but I appreciate our two witnesses being here today and for your, what I know will be, interesting testimony.

Let me begin by, again, welcoming everyone today. "Countering the Nuclear Threat to the Homeland: Evaluating the Procurement of Radiation Detection Technologies" will be the subject of our hearing today.

But before I do that, I would just like to take a moment before we begin here to basically discuss this subcommittee's agenda for the 110th Congress.

This subcommittee is faced with one of the most daunting challenges that confronts our nation today: securing our country from terrorists who are constantly thinking of new and innovative ways to harm us.

I think we can all agree that we are certainly safer than we were prior to September 11, 2001, but, as the 9/11 Commission itself said, we are not yet safe.

This subcommittee's primary focus will be on closing the most glaring gaps in our security. To that end, we will be holding a number of hearings, very important hearings, in the coming weeks and months ahead.

Today's hearing will be focusing on how we are dealing with the nuclear threat. And, with respect to biological security, the sub-



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committee plans to hold hearings next month on how we can strengthen Project BioShield.

Recent events have made clear that this program continues to struggle, and this hearing will provide an opportunity to closely examine how to streamline operations in this critical program. I intend to make this one of my top priorities as chairman of this subcommittee.

It is also crucial that we look for ways to increase the effectiveness of both the biological and nuclear detection technology that we have deployed along many of our border crossings and points of entry. This technology can be our last best chance to prevent a catastrophic attack. It is therefore crucial that we have the best technology at our disposal, and I also plan to hold hearings in the upcoming weeks on how we can best accomplish this goal.

I also intend to hold a number of hearings to explore how we can strengthen our nation's cybersecurity efforts. We rely heavily upon our cyber systems, and we must ensure that we have the most robust tools at our disposal to keep those systems secure.

Ranking Member McCaul and I have had the opportunity to discuss many of these issues, and I think we are both in agreement about the glaring threats that face our nation. I look forward to working with him and with the other members of the subcommittee to close the gaps and make our nation safer.

Turning back to today's hearing, I want to welcome and thank our witnesses.

Vayl Oxford is the director of the Domestic Nuclear Detection Office. And he and I have worked very closely on many of the issues that I previously mentioned.

I would also like to thank our second witness, Gene Aloise, of the Government Accountability Office, for coming today and for his work on this important topic.

First I want to begin by complimenting Mr. Oxford and the Domestic Nuclear Detection Office for working so aggressively to procure and deploy technologies to detect radiological and special nuclear materials at our nation's ports of entry. You have accomplished a lot in a very short time.

As of February 2007, radiation portal monitors, RPMs, were scanning 100 percent of all U.S. mail, 89 percent of all cargo entering through U.S. seaports, 96 percent of cargo at the southern border and 91 percent at the northern border, with expected increases to 97 percent at seaports and 99 percent at the southern border by the end of 2007.

To date, roughly 1,000 RPMs have been deployed. Future deployments designed to scan 100 percent of all conveyances will require an additional 1,500 to 2,000 units over the deployment schedule through fiscal year 2013.

While the subcommittee is impressed with DNDO's efforts, though, we are concerned that such an aggressive schedule might have resulted in shortcuts in the decision-making process to acquire ASP technology.

So this is the fundamental question that the subcommittee is examining today. The GAO's October 2006 report and the testimony submitted by Mr. Aloise certainly point to this possibility.

I would like to say that I understand that both of our witnesses are doing their duty to protect this country. And I applaud this hard work and dedication of the both of you.

It is my hope that through an open and thorough discussion, we will come to some agreement on how best to move forward.

For example, the cost-benefit analysis that was looked at in the GAO report assumed a 95 percent positive identification rate for highly enriched uranium, HEU. The 2005 test of the equipment showed that currently the advanced spectroscopic portals, or ASPs, didn't perform nearly this well.

We need to figure out why, and whether expecting this kind of performance is realistic, and, if not, how to move forward from here.

So I look forward to your testimony and to a fruitful discussion of this important issue.

The chair now recognizes the ranking member of the subcommittee, my partner in this effort, the gentleman from Texas, Mr. McCaul, for an opening statement.

Mr. MCCAUL. I thank the chairman. And thank you for your leadership and focus on what I believe are the highest priorities for this nation, in terms of protecting us from another terrorist attack.

I want to first start by thanking Mr. Oxford and Mr. Aloise for being here.

One of the most devastating scenarios for a terrorist attack on the United States, in my judgment, would be the use of a nuclear or radiological weapon on a populated area.

As we all know, the best way to prevent such an attack is to prevent such weapons from ever reaching our shores. And to counter this threat, the Domestic Nuclear Detection Office, or DNDO, has been tasked with the responsibility of detecting unauthorized radioactive material from being transported into and around the U.S.

And, Mr. Oxford, we have visited; I enjoyed our visit. I commend you and your people on your tremendous progress in undertaking this very challenging task, which I believe to be one of the biggest threats to this country.

Being from Texas, I understand the need for radiation detection systems, because the South Texas ports of entry are among the busiest in the nation. Laredo, Texas, is the busiest cargo land port in the U.S. And the port of Houston is the second-busiest seaport in total tonnage, moving more than about 200 million tons of cargo in 2006.

And traffic levels continue to increase as a result of the North American Free Trade Agreement. This means that there are more and more opportunities to smuggle radioactive material into the United States.

And today, this subcommittee will hear testimony from DNDO regarding its procurement of current-generation systems, the plastic PVT monitors, as compared to the next-generation systems, called the advanced spectroscopic portal monitors, as ASPs. We will also discuss the process DNDO followed in procuring and deploying the ASPs.

While the current PVT systems are able to detect radioactive material, the systems also have some serious limitations. PVT systems can't distinguish between innocent radioactive materials, such as kitty litter and medical isotopes, and nuclear threat materials. The result is a high rate of nuisance alarms that take time and manpower to investigate.

And one problem I could see happening is that a CBP officer who is frustrated with the number of nuisance alarms decides to raise the threshold of the system so it would only alarm if there is a large amount of radiation. While this would reduce the number of false alarms, it could also allow some worrisome radioactive material to go undetected.

Obviously that is a result we don't want to happen. A better solution, in part, would be to deploy better technology—technology that can detect and identify radioactive sources, technology that leads to little or no human error, and technology that will minimize delays to commerce while securing our nation from nuclear threats.

I hope the ASP system is part of the answer and that it can overcome the limitations of the PVT systems and its capabilities are worth the additional cost.

As part of their procurement process, DNDO conducted a cost-benefit analysis of the new ASP systems versus the old PVT systems. This analysis has been the subject of extensive review by the GAO, which concluded that the cost may outweigh the benefits of the new system.

Given that the procurement cost of the new systems could exceed $1 billion, it isn't surprising that Mr. Aloise here has taken a close eye to the ASP program.

Mr. Oxford is the steward of the domestic nuclear detection architecture. And, as that steward, I expect you to address GAO's concerns and that you will procure and deploy radiation detection equipment using a strategy that gives the best benefit for our dollars.

And, Mr. Aloise, I also expect that when you consider the cost of more advanced technology to resolve alarms that you will take into account the unimaginable devastation that could result from even one mistake that lets harmful material into this country.

Mr. Chairman, let me, again, thank you. And I yield back.

Mr. LANGEVIN. I thank the gentleman.

Other members of the subcommittee are reminded that, under the committee rules, opening statements may be submitted for the record.

And I would like to now turn to our panel of witnesses, again, welcoming both gentlemen.

Our first witness, Mr. Vayl Oxford, is the director of the Domestic Nuclear Detection Office, a position that he has held since April of 2005. DNDO serves as the primary entity in the United States government to improve the nation's capability to detect and report unauthorized 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.

Our second witness, Mr. Gene Aloise, is the director of the natural resources and environment team at GAO. He is GAO's recognized expert in international nuclear non-proliferation and safety issues. His work for GAO has taken him to some of Russia's closed nuclear cities and the Chernobyl reactor in Ukraine, as well as numerous nuclear facilities around the world and in the United

States. Mr. Aloise has had years of experience developing, leading and managing GAO domestic and international engagements.

Without objection, the witnesses' full statements will be inserted into the record.

I want to, again, welcome you both. Thank you for being here. And I ask now each witness to summarize your statement for 5 minutes, beginning with Mr. Oxford.

Welcome.

**STATEMENTS OF VAYL OXFORD, DIRECTOR, DOMESTIC NUCLEAR DETECTION OFFICE, DEPARTMENT OF HOMELAND SECURITY**

Mr. OXFORD. Thank you, Mr. Chairman, Ranking Member McCaul, and other members of the committee.

First of all, I would like to set the record straight that it is "Mr.", not "Dr." so that I don't either abuse others or be abused in a likewise manner.

I want to thank the committee for the opportunity to discuss how we are testing and evaluating next-generation technologies. In particular, I will describe the certification process that is required by the 2007 appropriation act that ASP will undergo before we commit to acquisition and deployment of these systems.

We recognize there were concerns raised in the October 2006 GAO report, but we stand behind the basic conclusions of our cost-benefit analysis.

Furthermore, we believe there has been a misunderstanding as to the intent of certain test series, the types of data collected, and the conclusions that were drawn. It is my hope that the information I provide today, including our path forward for the ASP program, is testament to the careful consideration we have given to our investments in ASP and, in turn, the GAO's concerns pertaining to next-generation technology.

I would like to make it clear that DNDO remains committed to fully characterizing systems before deploying them into the field.

Before I go into detail, I would like to again recap some of our success in deployments that we have had over time, that the chairman has already acknowledged.

Two years ago, 40 percent of incoming containerized cargo was being scanned for radiological and nuclear threats. Today we are scanning 91 percent of all containerized cargo coming across our land and sea ports of entry.

By 2007, we plan to have 98 percent of containerized sea cargo being scanned at the nation's top seaports. By 2008, we will scan 98 percent of containerized cargo transiting through land and sea ports of entry.

Now I would like to discuss the ASP program and our efforts related to the cost-benefit analysis.

Introducing these next-generation RPMs in the screening operation stems from the limitations in current PVT systems that detect the presence of radiation but cannot identify the specific isotopes. CBP relies on hand-held devices during secondary screening to provide isotope identification capability. Using ASP technology in secondary screening applications will greatly increase the overall effectiveness of CBP's screening.

PVT portals installed for primary screening will effectively alarm on unshielded sources of radiating material, but this will also include nuisance alarms from naturally occurring radioactive material, or NORM.

ASP will improve upon the identification capabilities of the current systems and minimize the diversion of legitimate commerce to secondary inspection. ASP will be especially important for high-volume ports of entry.

The past broad-agency announcement that we released to industry resulted in the competitive awarding of 10 contracts for prototype development. The prototype units were tested in the winter of 2005, and the results were used as part of a competitive process to select vendors to proceed with engineering development.

Production readiness testing—to include system performance testing against significant quantities of special nuclear material at the Nevada test site; stream-of-commerce testing at the New York Container Terminal; and systems qualification testing, which include shock, vibration and other environmental testing—is either under way now or will start soon.

Therefore, it is important to remember that the prototype tests in 2005 were never intended to be production readiness tests. The tests were designed to support the selection process for vendors that would receive engineering development contracts. Moreover, we have not yet made a production decision.

Regarding the cost-benefit analysis, let me briefly address the ASP issues. DNDO developed an initial cost-benefit analysis in the concept development phase of the program to determine whether further R&D was warranted.

The CBA considered five different alternative configurations for radiation detection equipment at our ports of entry. Each alternative was evaluated based on the probability to detect and identify threats, the impacts on commerce, and the soundness of the investment.

The preferred CBA alternative was a hybrid approach with ASP systems in primary screening and high-volume ports of entry, PVT systems in primary screening at medium-and low-volume POEs, and ASP systems for all secondary screening.

DNDO met on multiple occasions with the GAO staff to discuss the CBA methodology, assumptions, data sources, and results, and the fact that this was an initial CBA suitable for the concept development phase. Though we worked extensively with the GAO to further refine the CBA, confusion remained about our prototype test activities.

At this point, Mr. Chairman, I will be glad to answer any questions. I have a lot of other comments, but for the sake of time I will just use my written record as a summation.

[The statement of Mr. Oxford follows:]

PREPARED STATEMENT OF VAYL S. OXFORD

WEDNESDAY, MARCH 14, 2007

***Introduction***

Good afternoon, Chairman Langevin, Ranking Member McCaul, and distinguished members of the subcommittee. 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 how we are testing and evaluating next-generation technologies. In particular, I would like to describe the certification process, required by the FY 2007 Appropriations bill that the Advanced Spectroscopic Portals (ASPs) will undergo before we commit to purchasing and deploying the systems.

DNDO recognizes that there were concerns raised in the Government Accountability Office (GAO) report entitled, *"Combating Nuclear Smuggling: Department of Homeland Security's Cost-Benefit Analysis to Support the Purchase of New Radiation Detection Portal Monitors Was Not Based on Available Performance Data and Did Not Fully Evaluate All the Monitors? Costs and Benefits,"* dated October 12, 2006. Nonetheless, we stand behind the basic conclusions of the cost benefit analysis (CBA). We realize there may have been a misunderstanding as to the intent of certain test series, the types of data collected, and the conclusions that were drawn. It is my hope that the information we provide today, including our path forward for the ASP program, is testament to the careful consideration we have given to our investments in ASP systems and, in turn, the GAO's concerns pertaining to next-generation technology.

I would like to make it clear that DNDO remains committed to fully characterizing systems before deploying them into the field. This is a founding principle of our organization and we maintain a robust test and evaluation program for this purpose.

Before I go into more detail about our test program and the upcoming certification of ASP systems, I would like to highlight some DNDO accomplishments which have occurred since I last appeared before this committee.

*DNDO Accomplishments and Activities*

As we continue to test and develop radiation portal monitors (RPMs) for use at our ports, we are also expanding security beyond our ports of entry. In FY2007, DNDO will develop and test several new variants of passive detection systems based upon ASP technology. These include a planned retrofit of existing CBP truck platforms, commonly used at seaports, and the development and performance testing of an SUV-based prototype system suitable for urban operations, border patrol, and other venues.

The Systems Development and Acquisition Directorate is also executing the first phase of engineering development associated with the development of the Cargo Advanced Automated Radiography Systems (CAARS) system. A dominant theme within the nuclear detection community is that comprehensive scanning for smuggled nuclear materials requires both automated passive technologies and automated radiography systems. While ASP is DNDO's next generation passive detection system—providing an enhanced probability of success against unshielded or lightly shielded materials; CAARS will complement the ASPs by providing rapid automated detection of heavily shielded materials that no passive system can find. These two systems must function together to successfully detect nuclear threats at our Nation's ports. The three contractors selected by DNDO will proceed with system design and development efforts this year—including the development of many of the critical hardware and software components. DNDO, in coordination with Customs and Border Protection, will prepare the first CAARS deployment plan—describing in detail, where and how the CAARS units will be initially deployed, as well as a preliminary CAARS Cost Benefit Analysis and radiation health physics study.

DNDO also continues to develop handheld, backpack, mobile, and re-locatable assets with improved probability of identification, wireless communications capabilities, and durability. One specific goal is to deploy radiation detection capabilities to all U.S. Coast Guard inspection and boarding teams by the end of 2007. DNDO awarded contracts to five vendors in October 2006 for development of Human Portable Radiation Detection Systems (HPRDS), each of which will develop a HPRDS prototype unit. One promising HPRDS technology is the introduction of a lanthanum bromide detection crystal that may provide an extremely effective threat material identification capability along with a low false alarm rate. DNDO will also pursue research and development to standardize the flow of data to ensure rapid resolution of spectra acquired in the field, that need further validation as a threat or benign substance.

With regard to Advanced Technology Demonstrations (ATDs), DNDO will further develop the existing and proposed ATDs in FY 2007. We held the first preliminary design review of Intelligent Personal Radiation Locator (IPRL) on February 28th. Further critical design reviews of the IPRL ATD will be conducted in mid-FY08, to be followed by performance testing and cost-benefit analysis in late-FY08 and early-FY09. An additional ATD for Standoff Detection will also be initiated in FY2007. Under this ATD, various imaging techniques will be evaluated for sensitivity, directional accuracy, and isotope identification accuracy with a goal of extending the range of detection to as much as 100 meters, enabling a new class of airborne, land, and maritime applications.

The Exploratory Research program is continuing to work in support of future ATDs to understand and exploit the limits of physics for detection and identification of nuclear and radiological materials as well as innovative detection mechanisms. A few examples of exploratory topics include a new technique that would extend the ability of passive detectors to verify the presence of Special Nuclear Material (SNM) through shielding and creation of new detector materials that would perform better and cost less than current materials.

DNDO, in collaboration with the National Science Foundation (NSF), is beginning the Academic Research Initiative to fund colleges and universities to address the lack of nuclear scientists and engineers focusing on homeland security challenges through a dedicated grant program. A NSF survey shows a downward trend since the mid-1990s of nuclear scientists and engineers in the United States of approximately 60 per year. In 1980, there were 65 nuclear engineering departments actively operating in the U.S. universities; now there are 29. Currently, it is estimated that one-third to three-quarters of the current nuclear workforce will reach retirement in the next 10 years. Projections forecast the requirement for approximately 100 new Ph.D.s in nuclear science per year to reverse these trends and support growing areas of need. In order to address this requirement, the DNDO and NSF recently issued a solicitation for the Academic Research Initiative, which will provide up to $58M over the next five years for grant opportunities for colleges and universities that will focus on detection systems, individual sensors or other research relevant to the detection of nuclear weapons, special nuclear material, radiation dispersal devices and related threats. DNDO's Operations Support Directorate provided Preventative Rad/Nuc Detection training to 402 operations personnel in six state and local venues in FY 2006. We sponsored, designed, developed, and conducted the New Jersey multi-jurisdictional rad/nuc prevention functional exercise, Operation Intercept, in September 2006, with approximately 60 players (operators, law enforcement, fire/hazmat, intelligence analysts, etc.). DNDO's FY2007 goal is to train 1,200 State and local operators in Basic, Intermediate and Advanced Preventive Rad/Nuc Detection courses. DNDO Training and Exercises activities will also support DHS planning for the TOPOFF 4 full-scale exercise to be held in 4th Quarter FY 2007. DNDO is coordinating closely with other Federal agencies and State and Locals in developing radiological/nuclear scenarios.

The Southeast Transportation Corridor Pilot (SETCP) was initiated this past year to deploy radiation detection systems to interstate weigh stations. SETCP provided detection technologies (radiation portal monitors and mobile and handheld detection equipment) to five of the nine participating States in 2006, and this year we will equip the remaining states. Also, this year we plan to conduct a multi-state SETCP functional exercise using the weigh stations, the Southeast Regional Reachback Center, and the Joint Analysis Center (JAC).

The Securing the Cities (STC) Initiative is moving forward as we work with New York City (NYC) and regional officials (led by the New York Police Department) to develop an agreed-upon initial multi-jurisdictional, multi-pathway, defense-in-depth architecture for the defense of the NYC urban area. DNDO will conduct an analysis-of-alternatives for the deployment architecture, develop equipment specifications to address the unique needs of urban-area detection and interdiction, and develop and test these detection systems.

In FY 2006 a program to enhance and maintain pre-event/pre-detonation rad/nuc materials forensic capabilities was funded within the DHS S&T Directorate. That program transferred to DNDO on October 1, 2006. Concurrently, the DNDO established the National Technical Nuclear Forensics Center (NTNFC) to serve as a national-level interagency stewardship office for the Nation's nuclear forensic capabilities. Staff for this office includes experts from DHS, DoD, FBI, and DOE. Agencies are working together in a formal interdepartmental forum consisting of a senior level Steering Group and Working Groups for centralized NTNF planning, integration, and assessment. FY 2007 planned accomplishments include developing a strategic NTNF program plan and associated concept of operations (CONOPs) for rad/nuc forensics. These documents will describe and detail the roles and responsibilities of, and interactions between Federal agencies involved in the detection, collection, and forensic analysis of radiological/nuclear material(s) and device(s). DNDO will also establish a National Technical Nuclear Forensics (NTNF) Knowledge Base. This knowledge management program will include the creation of a knowledge base and analysis tools to support the timely and accurate interpretation of nuclear forensics data and information sharing among partners.

*Benefits of Next-Generation Detection Technology*

Now, I would like to discuss the ASP Program and our efforts in reference to the Cost Benefit Analysis and the steps required for certification. Our desire to introduce next-generation radiation portal monitors (RPMs) into screening operations stemmed from inherent limitations in the current-generation polyvinyl toluene (PVT) detectors. PVT detectors can detect the presence of radiation but cannot identify the specific isotopes present. Currently, CBP relies on hand-held radio-isotope identifier devices (RIIDs) during secondary screening to provide isotope identification capability. Introduction of isotope identifying ASP technology in secondary screening applications will greatly increase the overall effectiveness of CBP screening. PVT portals installed for primary screening will effectively alarm on all sources of radiating material. This unfortunately includes nuisance alarms such as granite tiles, ceramics, kitty litter and other naturally occurring radioactive material (NORM). Next-generation technology will improve upon the identification capabilities of current systems, and minimize the diversion of trucks and containers filled with legitimate commerce to a secondary inspection area where CBP Officers conduct a rather time-consuming, thorough investigation prior to release of the vehicle. This technology will be especially important for high volume or high NORM rate POEs, as it will lessen the burden on secondary inspection stations and the associated impact to the stream of commerce and CBP. Spectroscopic systems, like ASP, that use the signature of the radiation to make a simultaneous "detection and identification" decision provide one possible solution to this problem. However, further development and testing is required to resolve some remaining issues concerning the use of ASPs in primary, such as the potential masking of SNM by a large NORM signature.

In accordance with DHS Investment practice, DNDO executed a classic systems development and acquisition program for ASP. Namely, DNDO implemented a program that consisted of concept evaluation, prototype development and test, an engineering development phase, a low-rate-initial production phase—and eventually a full-rate production phase.

During the concept development phase, DNDO issued a Broad Agency Announcement to industry—and competitively awarded ten contracts for the development of prototype units. DNDO then tested the prototype units in the winter of 2005, again during the concept development phase of the program, and used these test results as part of the competitive source selection process to select vendors to proceed with engineering development. Subsequent to the award of three ASP engineering development contracts to Thermo-Electron Corporation, Raytheon Corporation and Canberra Industries, DNDO directed the development of one ASP Engineering Development Model—or EDM—designed and built with the rigor necessary to be found suitable for production. Production Readiness Testing, including System Performance Testing against significant quantities of SNM at the Nevada Test Site, Stream-Of-Commerce Testing at the New York Container Terminal, and System Qualification Testing, which includes shock, vibration, and other environmental testing, is being conducted as we speak.

As I address many detailed concerns—I think it is very important to preface my statements by reiterating that the Winter 05 prototype test was never intended to be a production readiness test—nor a formal developmental test. The tests were designed to facilitate the competitive process by selecting those vendors that would receive further engineering development contracts, based in part, on the performance of their prototype systems. Much of the perceived confusion with regard to ASP performance stems from a miscommunication with regard to what the test results mean and what they do not mean and the complete evaluation process for ASP.

*Cost-Benefit Analysis*

Let me briefly address the ASP cost-benefit analysis. As I mentioned earlier, DNDO developed a first-cut cost benefit analysis (CBA) in the concept development phase of the ASP Program. Many DHS programs, such as ASP, produce a CBA in the concept development phase and subsequently update it as part of what the Department has referred to as Key Decision Point Three—the full-scale full-scale production milestone decision. An initial CBA (based simply upon studies, analyses, and modeling results) is required for all DHS investments during the concept development phase to determine whether further R&D investment is prudent.

The CBA fundamentally considered five different alternative configurations of radiation detection equipment at a CBP Ports of Entry. Specifically, the alternatives included:

#1—referred to as the 'status quo' alternative consisted of the use of a current-generation PVT-based RPM in what is referred to as 'Primary Inspection' coupled with a second such system in secondary inspection—along with a current generation handheld device used for identification.

#2—referred to as the "adjusted threshold" alternative; is identical to alternative #1 except that the PVT systems are set to their maximum sensitivity and, hence, experience the highest false alarm rate

#3—referred to as the 'enhanced secondary' alternative; consists of a current-generation PVT-based RPM system in primary with an ASP Portal in 'secondary'.

#4—referred to as the 'hybrid' alternative where ASP systems are deployed in primary and secondary locations for high volume and high NORM rate POEs and PVT systems are used in Primary with an ASP in secondary for medium and low volume ports

And #5—referred to as the 'All ASP' alternative; consists of placing ASP in both primary and secondary inspection areas.

Each alternative was evaluated on the basis of probability to detect and identify threats, impact on commerce, and soundness of the investment.

The preferred alternative recommended by the CBA was a hybrid approach consisting of ASP systems for primary screening at high-volume ports of entry (POEs), PVT systems for primary screening at medium and low-volume POEs, and ASP systems for all secondary screening. The DNDO/CBP Joint Deployment Strategy describes the way in which the mix of PVT and ASP portals would be deployed to maximize the benefit of ASP, while minimizing the cost. We plan on initiating a phased installation by first installing the monitors for secondary inspection. This will allow CBP to gain operating experience and allow time to further evaluate the ASPs as a primary inspection tool.

DNDO met on multiple occasions with the GAO staff to discuss the CBA methodology, assumptions, data sources, and results and the fact that this was an initial CBA, suitable for the Concept Development phase of a program. We worked extensively with the GAO to further refine the CBA and provided written responses to the GAO documenting the technical rationale for DNDO's approach.

Nonetheless, confusion remained about our prototype test activities. Specifically, the GAO criticized DNDO for assuming a probability of detection of 95 percent, even though the Winter-05 test results did not show this same capability. Once again, as I mentioned above, the Winter-05 test results cited by the GAO were not intended to determine the absolute capabilities of deployed systems; rather, they were intended to support initial source selection decisions. We remain committed to high fidelity testing and are currently conducting a complete set of System Performance tests prior to ASP Full Rate Production.

The GAO reported that DNDO tested the performance of PVT and ASP systems side-by-side, but did not use these results in the CBA. Again, the test series referenced was not intended to provide an objective side-by-side comparison of PVT and ASP systems; it was intended solely to provide an objective side-by-side comparison of the competing vendors' prototypes. While the Winter-05 Tests were aimed at ASP source selection, it is the tests we are conducting now—the Winter-06 Tests—that are aimed specifically at assessing the cost-benefit associated with ASP and will therefore provide an ASP and PVT and Handheld side-by-side analysis that one would expect to see at this point in the program.

The GAO also stated that the CBA only evaluated systems' ability to detect highly enriched uranium (HEU) and did not consider other threats. DNDO agrees that threats other than HEU are equally important—and our Winter 06 test is evaluating the Production ASP units against a full set of Special Nuclear Materials—including those that might be used for an improvised nuclear devise and those that might be used for a radiological dispersal device.

We agree with the GAO that further test and evaluation of ASP systems must occur. Indeed, DNDO always planned on validating its assumptions through further testing prior to making a production decision.

Upon the successful completion of its ASP evaluation, DNDO intends to request Key Decision Point Three (KDP–3) approval—that is permission to enter full rate production of ASP—in the summer of this year. Our request will be based upon completed and documented test results from test campaigns to be conducted at NTS, NYCT, and at contractor facilities; as well as interim results from deployment integration testing to be conducted at the Pacific Northwest National Laboratory (PNNL) Integration Laboratory (frequently referred to as the 331G facility), and one or more field validation efforts in which an ASP unit is installed in "secondary screening" at an operational POE in tandem with existing approved interdiction systems.

The test results from this campaign will facilitate the Secretary's certification decision that is called for in the FY 2007 Homeland Security Appropriations Act (P.L. 109–295). DNDO will commit to full-rate production only after we are confident that ASP systems significantly upgrade our detection capabilities and operational effectiveness and that they meet the Department's goal to protect our Nation from dangerous goods. DNDO will use a combination of cost-benefit analyses as well as demonstrated performance metrics to assist in the Secretary?s certification decision.

*Contract Awards for ASP*

As I have stated earlier, one of our major accomplishments this past year was issuing Raytheon Company—Integrated Defense Systems, Thermo Electron Company, and Canberra Industries, Inc. contract awards for engineering development and low-rate initial production of ASP systems. Initial ASP contract awards totaled approximately $45 million. The priority for the base year is development and testing of the fixed radiation detection portal that will become the standard installation for screening cargo containers and truck traffic. The total potential award of $1.2 billion, including options, will be made over many years, based upon performance and availability of funding.

*Future Deployment*

DNDO intends to deploy ASP systems to the Nation's POEs based on the Joint Deployment Strategy I referenced earlier. In addition, ASP systems will be deployed overseas through the Department of Energy's (DOE) Megaports Initiative to work in cooperation with currently deployed PVT—based radiation portal monitors in those venues. DOE has purchased ASP units for use with MegaPorts from DNDO?s existing contract.

*Conclusion*

DNDO is improving capabilities in detection and interdiction of illicit materials, intelligence fusion, data mining, forensics, and effective response to radiological or nuclear threats. It is the intention of DNDO to fully test and evaluate emerging technologies, in order to make procurement and acquisition decisions that will best address the detection requirements prescribed by the Global Nuclear Detection Architecture. We work with our interagency and intra-agency partners to ensure that deployment and operability of our systems enhance security and efficiency without unnecessarily impeding commerce.

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

Mr. LANGEVIN. Thank you, Mr. Oxford.

And now I would like to turn to Mr. Aloise to summarize his statement for 5 minutes.

Mr. Aloise?

**STATEMENT OF GENE ALOISE, DIRECTOR, NATURAL RESOURCES AND ENVIRONMENT, U.S. GOVERNMENT ACCOUNTABILITY OFFICE**

Mr. ALOISE. Thank you, Mr. Chairman.

Mr. Chairman and members of the subcommittee, I am pleased to be here today to discuss DNDO's cost-benefit analysis used to support the purchase and deployment of the next generation of radiation portal monitors.

This is an important decision not only for cost reasons but, more importantly, for national security reasons.

DNDO would like to improve the capabilities of its portal monitors so that they can perform the dual roles of detecting radiation and specifically identifying radiological materials.

In our March 2006 report, we recommended that DHS conduct a cost-benefit analysis to determine whether the new portal monitors will provide additional security and are worth the cost.

My remarks are based on our October of 2006 report that evaluated DNDO's cost-benefit analysis.

DNDO's cost-benefit analysis does not provide a sound analytical basis for its decision to purchase and deploy the new portal monitors.

Some of the problems with the analysis include: DNDO assumed the new portals would correctly identify HEU 95 percent of the time, instead of using actual test results that showed that the new portals did not come close to meeting that assumption.

Further, DNDO used unreliable performance data for the current portals, which, in comparison, made the performance of the new portals look better than it actually was.

And the analysis focused on HEU and did not consider how well the new portals could detect and identify other dangerous radiological and nuclear material.

Regarding DNDO's cost estimates, DNDO used highly inflated cost estimates for the current portal monitors—$131,000 per portal instead of the contract price at the time of $55,000 per portal—which made the current portals look much more expensive that they actually were.

Furthermore, DNDO did not determine the baseline cost of secondary inspections. This makes it impossible to determine whether the use of the new portals will actually be cheaper to use than the current portals.

The analysis also did not include development cost, and it underestimated lifecycle equipment cost. The lifecycle cost alone could add another $181 million to the cost of the new equipment, which has already exceeded the original estimate by $200 million.

Finally, DNDO focused its analysis on measuring how much the new portals might improve the flow of commerce into the United States, but it did not address whether this equipment would improve our security against nuclear smuggling.

The bottom line is, Mr. Chairman, DNDO's cost-benefit analysis does not justify its decision to spend $1.2 billion to deploy the new portal monitors. The data used in the analysis was incomplete and unreliable, and, as a result, we do not have any confidence in it.

Mr. Chairman, that concludes my remarks. I would be happy to respond to any questions you or members of the subcommittee may have.

[The statement of Mr. Aloise follows:]

PREPARED STATEMENT OF GENE ALOISE *

WEDNESDAY, MARCH 14, 2007

Mr. Chairman and Members of the Subcommittee:

I am pleased to appear here today to discuss our assessment of the Department of Homeland Security's (DHS) May 2006 cost-benefit analysis used to support the

* GAO *Combating Nuclear Smuggling: DHS' Decision to procure and Deploy the Next Generation of Radiation Detection Equipment Is Not Supported by Its Cost-Benefit Analysis*, GAO–07–581T (Washington, D.C.: March 14, 2007).

purchase and deployment of next generation radiation portal monitors.[1] This is an important decision because, if procured, these new portal monitors will be considerably more expensive than the portal monitors in use today. Combating nuclear smuggling is one of our nation's key national security objectives and the deployment of radiation detection equipment including portal monitors at U.S. ports of entry, including border crossings and domestic seaports, is an integral part of this system. DHS, through its Domestic Nuclear Detection Office (DNDO), is responsible for acquiring and supporting the deployment of radiation detection equipment, including portal monitors, within the United States. The Pacific Northwest National Laboratory (PNNL), one of the Department of Energy's (DOE) national laboratories, is under contract to manage the deployment of radiation detection equipment for DHS.[2] U.S. Customs and Border Protection (CBP) is responsible for screening cargo as it enters the nation at our borders, which includes operating radiation detection equipment to interdict dangerous nuclear and radiological materials.

The radiation portal monitors in use today can detect the presence of radiation, but they cannot distinguish between types of radiological material. For example, they cannot tell the difference between harmless products that emit radiation, such as ceramic tile, and dangerous materials, such as highly enriched uranium (HEU), that could be used to construct a nuclear weapon. Generally, CBP's standard procedures require incoming cargo to pass through one of these radiation portal monitors to screen for the presence of radiation. This "primary inspection" serves to alert CBP officers when a radioactive threat might be present. If there is a potential threat, CBP procedures require a "secondary inspection." To confirm the presence of radiation, this secondary inspection usually includes a second screening by a radiation portal monitor as well as a screening by CBP officers using radioactive isotope identification devices. These handheld devices are used to differentiate between types of radioactive material to determine if the radiation being detected is dangerous. Both the radiation portal monitors and handheld devices are limited in their abilities to detect and identify nuclear material.

DHS would like to improve the capabilities of its portal monitors so that they can perform the dual roles of detecting radiation and identifying radiological materials. In this regard, DHS has sponsored research, development, and testing activities designed to create the next generation of portal monitors capable of performing both functions. These new, advanced portals are known as advanced spectroscopic portals (ASPs). In July 2006, DHS awarded contracts to three vendors for developing the advanced spectroscopic portals' capabilities. These awards were based mainly on performance tests conducted at DHS's Nevada Test Site in 2005, where ten competing advanced spectroscopic vendors' monitors were evaluated. At the same time, three current technology portal monitors were also tested.

To ensure that DHS's substantial investment in radiation detection technology yields the greatest possible level of detection capability at the lowest possible cost, in a March 2006 GAO report,[3] we recommended that once the costs and capabilities of ASPs were well understood, and before any of the new equipment was purchased for deployment, the Secretary of DHS work with the Director of DNDO to analyze the costs and benefits of deploying ASPs. Further, we recommended that this analysis focus on determining whether any additional detection capability provided by the ASPs was worth the considerable additional costs. In response to our recommendation, DNDO issued its cost-benefit analysis in May 2006, and an updated, revised version in June 2006. According to senior agency officials, DNDO believes that the basic conclusions of its cost-benefit analysis show that the new advanced spectroscopic portal monitors are a sound investment for the U.S. government.

Mr. Chairman, my remarks today focus on the cost-benefit analysis DNDO used in support of its decision to purchase new ASP portal monitors. Specifically, I will discuss whether DNDO's June 2006 cost-benefit analysis provides an adequate basis for the substantial investment that acquiring and deploying ASPs will necessitate.

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[1] GAO, *Combating Nuclear Smuggling: DHS's Cost-Benefit Analysis to Support the Purchase of New Radiation Detection Portal Monitors Was Not Based on Available Performance Data and Did Not Fully Evaluate All the Monitors' Costs and Benefits,* GAO–07–133R (Washington, D.C.: Oct. 17, 2006). GAO, *Combating Nuclear Smuggling: DHS Has Made Progress Deploying Radiation Detection Equipment at U.S. Ports of Entry, but Concerns Remain,* GAO–06–389 (Washington, D.C.: Mar. 22, 2006).

[2] DOE manages the largest laboratory system of its kind in the world. The mission of DOE's 22 laboratories has evolved. Originally created to design and build atomic weapons, these laboratories have since expanded to conduct research in many disciplines—from high-energy physics to advanced computing.

[3] GAO, *Combating Nuclear Smuggling: DHS Has Made Progress Deploying Radiation Detection Equipment at U.S. Ports of Entry, but Concerns Remain,* GAO–06–389 (Washington, D.C.: Mar. 22, 2006).

My testimony is based upon our October 2006 report that evaluated DNDO's cost-benefit analysis.[4] The work for our report was done in accordance with generally accepted government auditing standards.

In summary, DNDO's 2006 cost-benefit analysis does not provide a sound analytical basis for its decision to purchase and deploy the new advanced spectroscopic portal monitor technology.

*Regarding the performance of the portal monitors:*

- Instead of using the results of its performance tests conducted in 2005, DNDO's analysis simply assumed that ASPs could detect highly enriched uranium 95 percent of the time, a performance level far exceeding the capabilities of the new technology's current demonstrated capabilities. The 2005 test results showed that the best of the three winning vendor monitors could only identify masked HEU[5] about 50 percent of the time.
- To determine the current generation of portal monitors' performance in detecting HEU, DNDO used data from limited tests carried out in 2004 that test officials concluded was unreliable for such purposes. In their written report, test officials explicitly stated that the data were not indicative of how well current technology portal monitors might perform in the field particularly for detecting HEU.
- DNDO's analysis of the new technology portal monitors' performance was deficient because it focused on detecting and identifying HEU, but did not fully consider other dangerous radiological or nuclear materials. DNDO should have assessed the ASPs' abilities to detect several realistic threat materials.

*Regarding cost estimates:*

- In comparing the costs of the new and current technologies, the procurement costs of the current generation portal monitors were highly inflated because DNDO assumed a unit cost of about $131,000, while the contract price at the time of the analysis was about $55,000. According to officials who manage the contract, it was to expire and while they expected portal monitor prices to increase, they did not believe the cost would be as much as the price used in DNDO's analysis.
- DNDO stated that the primary benefit of deploying the new portal monitors is reducing unnecessary secondary inspections. However, DNDO's analysis did not fully estimate today's baseline costs for secondary inspections, which makes it impossible to determine whether the use of the new portal monitors as currently planned will result in significant cost savings for these inspections.
- The new portal monitor contract price has exceeded DNDO's total cost estimate by about $200 million. The cost-benefit analysis shows the total cost for deploying both current and new portal monitors to be about $1 billion. However, in July 2006, DHS announced that it had awarded contracts to develop and purchase up to $1.2 billion worth of the new portal monitors over 5 years.
- DNDO's cost-benefit analysis omitted many factors that could affect the cost of new portal monitors, such as understating the life-cycle costs for operating and maintaining the equipment over time.

*Background*

In general, DHS is responsible for providing radiation detection capabilities at U.S. ports of entry. Until April 2005, CBP managed this program. However, on April 15, 2005, the President directed the establishment of DNDO within DHS. DNDO's duties include acquiring and supporting the deployment of radiation detection equipment, including portal monitors. CBP continues its traditional screening function at ports of entry to interdict dangerous nuclear and radiological materials through the use of radiation detection equipment. The SAFE Port Act of 2006 formally authorizes DNDO's creation and operation.[6] PNNL manages the deployment of radiation detection equipment for DHS.

DHS's program to deploy radiation detection equipment at U.S. ports of entry has two goals. The first is to use this equipment to screen all cargo, vehicles, and individuals coming into the United States. The second is to screen this traffic without delaying its movement into the nation. DHS's current plans call for completing the deployment of radiation portal monitors at U.S. ports of entry by September 2013. The current technology portal monitors, known as plastic scintillators or PVTs, cost

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[4] GAO, *Combating Nuclear Smuggling: DHS's Cost-Benefit Analysis to Support the Purchase of New Radiation Detection Portal Monitors Was Not Based on Available Performance Data and Did Not Fully Evaluate All the Monitors' Costs and Benefits,* GAO–07–133R (Washington, D.C.: Oct. 17, 2006).

[5] "Masking" is an attempt to hide dangerous nuclear or radiological material by placing it with benign radiological sources.

[6] Pub. L. No. 109–347, tit. V, 120 Stat. 1884, 1932 (2006).

about $55,000 per unit, while the advanced spectroscopic portal monitors, known as ASPs, will cost around $377,000 per unit.[7]

In July 2006, DHS announced that it had awarded contracts to three ASP vendors to further develop and purchase $1.2 billion worth of ASPs over 5 years. Congress, however, provided that none of DNDO's appropriated funds for systems acquisition could be obligated for full procurement of ASPs until the Secretary of DHS certifies through a report to the Committees on Appropriations for the Senate and House of Representatives that ASPs would result in a significant increase in operational effectiveness.[8]

*DNDO Ignored Its Own Performance Test Results and Instead Relied on the Potential Performance of New Portal Monitors and Unreliable Estimates of Current Equipment Performance*

DHS is developing new portal monitors, known as ASPs that, in addition to detecting nuclear or radiological material, can also identify the type of material. In 2005, DNDO conducted side-by-side testing at the Nevada Test Site (NTS)[9] on 10 ASP systems and 3 PVT systems developed by private sector companies, including the PVT systems currently deployed. DHS requested that the National Institutes of Standards and Technology (NIST) provide assistance by conducting an independent analysis of data acquired during the last phase of developmental testing of ASPs to help DHS determine the performance of ASP portal monitors being proposed by private sector companies. NIST compared the 10 ASP systems, and in June 2006 submitted a report to DHS on the results of that testing.[10]

Performance tests of ASPs showed that they did not meet DNDO's main performance assumption in the cost-benefit analysis of correctly identifying HEU 95 percent of the time it passes through portal monitors. The 95 percent performance assumption included ASPs' ability to both detect bare, or unmasked, HEU in a container and HEU masked in a container with a more benign radiological material.[11] Based on NIST's assessment of the performance data, the ASP prototypes (manufactured by the three companies that won DNDO's recent ASP procurement contract) tested at NTS identified bare HEU only 70 to 88 percent of time. Performance tests also showed that ASPs' ability to identify masked HEU fell far short of meeting the 95 percent goal established for the cost-benefit analysis. According to DNDO, identifying masked HEU is the most difficult case to address. DOE officials told us that benign radiological materials could be used to hide the presence of HEU. NIST reported that the best ASP prototype DNDO tested in Nevada during 2005, and which won a procurement contract, was able to correctly identify masked HEU and depleted uranium (DU) only 53 percent of the time. Similarly, the ASP prototypes submitted by the other two companies that won DNDO ASP procurement contracts were able to identify masked HEU and DU only 45 percent and 17 percent of the time.

Despite these results, DNDO did not use the information from these tests in its cost-benefit analysis. Instead, DNDO officials told us that since the new portal monitors cannot meet the 95 percent detection goal, they relied on the assumption that they will reach that level of performance sometime in the future. DNDO officials asserted that the ASPs' current performance levels would improve, but they provided no additional information as to how the 95 percent goal will be achieved or an estimate of when the technology would attain this level of performance.

Moreover, DNDO's cost-benefit analysis only considered the benefits of ASPs' ability to detect and identify HEU and did not consider the ASPs' ability to detect and identify other nuclear and radiological materials. The ability of an ASP to identify specific nuclear or radiological materials depends on whether the ASP contains software that is specific to those materials. In our view, a complete cost-benefit analysis would include an assessment of ASPs' ability to detect and identify a variety of nuclear and radiological material, not just HEU. By excluding radiological and nuclear materials other than HEU, DNDO's analysis did not consider the number of secondary inspections that would be related to these materials and hence it likely underestimated the costs of ASP use. Further, DNDO told us the assumptions for the

[7] Prices include only equipment purchase. Installation costs are extra.

[8] Department of Homeland Security Appropriations Act for Fiscal Year 2007, Pub. L. No. 109–295, tit. IV, 120 Stat. 1355, 1376 (2006).

[9] DHS and DOE are collaborating in building a new Radiological and Nuclear Countermeasures Test and Evaluation Complex at the Nevada Test Site to support the development, testing, acquisition, and deployment of radiation detection equipment. The facility is expected to become fully operational in early 2007. Currently, an interim facility at NTS is being used to test radiation detection equipment.

[10] NIST did not evaluate the PVTs or compare their performance to the performance of the ASPs.

[11] The ability to detect masked HEU is based on DOE guidance on performing the evaluation.

ability of ASP systems to detect and identify HEU 95 percent of the time came from the ASP performance specifications. However, we examined the performance specifications and found no specific requirement for detecting or identifying HEU with a 95 percent probability.[12] While there is a requirement in the performance specification for the identification for HEU and other special nuclear material, we found no associated probability of success in performing this function.

DNDO's cost-benefit analysis also may not accurately reflect the capabilities of PVTs to detect nuclear or radiological material. DNDO officials acknowledged that DNDO tested the performance of PVTs along with the ASPs in 2005, but did not use the results of these tests in its cost-benefit analysis. According to these officials and NIST staff who assisted in the testing, the PVT performance data were unusable because the PVTs' background settings were not set properly. Consequently, DNDO officials told us the analysis was based on the performance of PVT monitors that PNNL tested during 2004 in New York. However, the results from these field tests are not definitive because, as PNNL noted in its final report, the tests did not use HEU and, therefore, the results from the tests did not indicate how well PVT portal monitors would be able to detect HEU in the field.[13] Moreover, the PVT portal monitors that PNNL used had only one radiation detection panel as opposed to the four-panel PVT monitors that DHS currently deploys at U.S. ports of entry. An expert at a national laboratory told us that larger surface areas are more likely to detect radiological or nuclear material. DNDO also stated that due to the nature of the testing at the Nevada Test Site, the tests did not provide the data needed for the cost-benefit analysis. According to DNDO officials, this data would come from analysis of the performance of fielded systems at U.S. ports-of-entry where the probability to detect threats could be compared to false alarm rates.

DNDO's director stated twice in testimony before the House Homeland Security Committee, Subcommittee on Prevention of Nuclear and Biological Attack—once on June 21, 2005, and again on May 26, 2006—that the ASP and PVT portals would be evaluated against one another in "extensive high-fidelity" tests. In our view, the results of such testing are critical to any decision by DNDO to employ new technology, such as ASPs, that might help protect the nation from nuclear smuggling. According to DNDO officials, new tests now underway at the DHS Nevada Test Site are comparing the performance of ASPs and PVTs side-by-side.

*DNDO's Cost-Benefit Analysis was Incomplete and Used Inflated Cost Estimates for PVT Equipment*

DNDO officials told us they did not follow the DHS guidelines for performing cost-benefit analyses in conducting their own cost-benefit analysis.[14] These guidelines stipulate, among other things, that such studies should address all of the major costs and benefits that could have a material effect on DHS programs. However, DNDO's analysis omitted many factors that could affect the cost of new radiation portal monitors. For example, DNDO officials told us that there are over 12 different types of ASP monitors, yet they only estimated the cost of cargo portal monitors that would be used at land border crossings. In reality, DNDO and CBP plan to deploy different types of ASPs that would have varying costs, such as portal monitors at seaports which would have higher costs. Additionally, DNDO did not capture all the costs related to developing the different types of ASP monitors. In our view, developing realistic cost estimates should not be sacrificed in favor of simplicity.

DNDO also underestimated the life-cycle costs for operations and maintenance for both PVT and ASP equipment over time. DNDO's analysis assumed a 5-year life-cycle for both PVT and ASP equipment. However, DNDO officials told us that a 10-year life-cycle was a more reasonable expectation for PVT and ASP equipment. The analysis assumes that the annual maintenance costs for PVT and ASP monitors will each equal 10 percent of their respective procurement costs. This means that maintenance costs for PVTs would be about $5,500 per year per unit based on a $55,000 purchase price and ASP maintenance costs would be about $38,000 per year per unit based on a $377,000 purchase price. Given the much higher maintenance costs

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[12] The performance specifications contain a requirement for detecting, not identifying, californium-252 with a 95 percent probability. Californium-252 has similar radiological properties to HEU. In addition, the performance specifications contain a requirement for detecting, but not identifying, other radiological materials such as cobalt-57, cobalt-60, barium-133, cesium-137, and americium-241.

[13] Pacific Northwest National Laboratory, *A Sensitivity Comparison of NaI and PVT Portal Monitors at a Land-Border Port-of-Entry,* p. iii, November 2004. For Official Use Only.

[14] DHS, Capital Planning and Investment Control, *Cost-Benefit Analysis (CBA) Guidebook 2006, Version 2.0,* February 2006. Traditional rules of performing cost-benefit analyses include assessing the full life-cycle costs for operation and maintenance, and determining the level of confidence in cost data.

for ASPs and the doubling of the life-cycle to 10 years, the long-term implications for these cost differences would be magnified. Consequently, DNDO's analysis has not accounted for about $181 million in potential maintenance costs for ASPs alone.

Furthermore, DNDO did not assess the likelihood that radiation detection equipment would either misidentify or fail to detect nuclear and radiological materials. Rather, DNDO's cost-benefit analysis focuses on the ability of ASPs to reduce false alarms—alarms that indicate nuclear or radiological material is in a container when, in fact, the material is actually non-threatening, such as ceramic tile. Reducing false alarms would reduce the number of secondary inspections of non-threatening nuclear and radiological materials and therefore the costs of those inspections. However, as required by DHS's guide to performing cost-benefit analyses, DNDO's analysis did not include all costs. In particular, the analysis did not include the potentially much bigger cost of "false negatives." False negatives are instances in which a container possesses a threatening nuclear or radiological material, but the portal monitor either misidentifies the material as non-threatening or does not detect the material at all, thus allowing the material to enter the country. During the 2005 Nevada tests, the incidence of false negatives among the three vendors who received contracts ranged from about 45 percent to slightly more that 80 percent. This raises concerns because, as explained to us by a scientist at a national laboratory, at this level of performance, ASPs could conceivably misidentify HEU as a benign nuclear or radiological material or not detect it at all, particularly if the HEU is placed side by side with a non-threatening material such as kitty litter.

In recent testimonies before Congress, DNDO's Director has cited the primary benefit of deploying ASP monitors as reducing unnecessary secondary inspections.[15] DNDO's cost-benefit analysis focused on measuring the benefits of ASP's ability to reduce false alarms—alarms that indicate nuclear or radiological material is present when, in fact, it is not or such material is actually non-threatening. Reducing false alarms would reduce the number of secondary inspections of non-threatening nuclear and radiological materials and therefore the costs of those inspections. Even on this point, however, DNDO's analysis was flawed. For example, it did not estimate the costs of secondary inspections as they are carried out today. DNDO's analysis needs these baseline costs to compare alternatives because without them, it is impossible to determine whether the use of ASPs, as planned, will result in cost savings for secondary inspections. While we agree that facilitating commerce at U.S. ports of entry by reducing unnecessary secondary inspections is an important goal, we believe that the primary rationale for deploying portal monitors should be to protect the nation from nuclear and/or radiological attack. We found that DNDO's analysis did not even attempt to measure the level—or value—of security afforded by portal monitors.

In addition, the ASP contract award has exceeded DNDO's estimate for total cost by about $200 million. The cost-benefit analysis shows the total cost for deploying PVT and ASP monitors to be about $1 billion, which covers all costs related to acquisition, design, maintenance, and physical inspection over 5 years (for both PVT and ASP). However, in July 2006, DHS announced that it had awarded contracts to develop and purchase up to $1.2 billion worth of ASP portal monitors over 5 years. Furthermore, the cost-benefit analysis underestimates total deployment costs and does not account for other major costs, such as physical inspections of cargo containers, an additional procurement of 442 new PVT monitors, installation and integration, and maintenance.

Finally, DNDO overstated the purchase price of PVT monitors. Although DHS is currently paying an average of about $55,000 per monitor, DNDO's cost-benefit analysis assumed the PVT would cost $130,959—the highest published manufacturers' price for the government.[16] According to DNDO's Director, DNDO chose the highest published price because the current contract for portal monitors at that time was to expire, and the portal monitors will probably cost more in the future. However, the information DNDO provided us does not explain why DNDO assumes that the future price will be more than double what DHS was currently paying, as assumed in DNDO's analysis. PNNL officials told us that the future price will almost certainly be lower than the price used in DNDO's analysis.

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[15] *Enlisting Foreign Cooperation in U.S. Efforts to Prevent Nuclear Smuggling: Hearing Before the House Committee on Homeland Security, Subcommittee on Prevention of Nuclear and Biological Attack,* 109th Cong. (May 25, 2006)(statement of Mr. Vayl S. Oxford, Director, DNDO); *Detecting Smuggled Nuclear Weapons, Hearing Before the Senate Judiciary Committee, Subcommittee on Terrorism, Technology, and Homeland Security,* 109th Cong. (July 27, 2006)(statement of Mr. Vayl S. Oxford, Director, DNDO).

[16] DNDO, *Cost Benefit Analysis for Next Generation Passive Radiation Detection of Cargo an the Nation's Border Crossings,* May 30, 2006.

In conclusion, DNDO's approach to the cost-benefit analysis omitted many factors that could affect the cost of new radiation portal monitors. For these reasons, DHS's cost-benefit analysis does not meet the intent of our March 2006 report recommendation to fully assess the costs and benefits before purchasing any new equipment.

Mr. Chairman, this concludes my prepared statement. I would be happy to respond to any questions that you or other members of the Subcommittee may have.

Mr. LANGEVIN. Thank you, Mr. Aloise.

I want to thank all the witnesses for their testimony.

And I will remind each of the members that he or she will have 5 minutes to question the panel.

And I will now recognize myself for 5 minutes.

Mr. Oxford, with respect to some of Mr. Aloise's testimony, I know that you and I have had the opportunity to speak to some of these issues. And I wanted to give you the opportunity to respond for the record.

The overriding question that I think most members are wondering is if DNDO had preordained its decision to acquire ASP technology. And I ask the question based on, in June 2005, during testimony before the predecessor to this subcommittee, the Prevention of Nuclear and Biological Attack Subcommittee, last session, you touted ASP technology as superior to the portal monitors already in use.

Again, in March 2006, roughly 3 months prior to the completion of DNDO's cost-benefit analysis, you testified before the Senate that portal monitor deployment strategy is an optimized mix of current and next-generation technologies. And the cost-benefit analysis basically put forth that solution.

So my question is, does the fact that you made these statements well in advance of DNDO's analysis indicate that you had already made up your mind, or others had made up their mind, on ASPs long before any testing and analysis was performed?

And if you didn't preordain the decision, what was the basis of your early confidence in ASPs, given the lack of credible comparative performance data?

Mr. OXFORD. Thank you, Mr. Chairman.

First of all, the only preordination that we did was that we needed spectroscopic systems. We did not commit to an actual acquisition, as I mentioned.

We only committed, at the time that we awarded the contracts last July, $45 million to the three vendors to complete their designs, to develop their engineering development model, and then to put them into subsequent testing.

The concerns of the GAO, in some cases, are well-founded, but they were not production readiness tests. They were intended to allow us to take the 10 vendors that had been under contract with us and others—we had a full and open competition; we actually had one vendor that came in that had not been part of our previous program—to fully compete for the down-select for the engineering development phase.

Upon award of that contract, we awarded a very flexible contract that allows us to execute options should performance warrant production. We did not want to take another year in between engineering and development and production to have to go through a separate source selection with these vendors.

So we did the source selection at one time. We have options that extend out to 5 years beyond the current performance period. So if the testing we are doing now warrants production, we can immediately go into that production.

But we had every intention of going through a traditional development and acquisition process that includes going back to our investment review board with the deputy secretary and ultimately to the secretary to have him make the decision that it was worth $1 billion of this country's money to go to production.

So we have not committed to production. We were always committed to doing the prudent testing.

The test series we have laid out includes the testing at Nevada test site against the special nuclear material, the radiological material as well as NORM.

We have also installed these systems at the New York Container Terminal so they will be subjected to the stream of commerce, so we can fully validate false-alarm rates against commerce. We are anticipating 10,000 occupancy as part of that.

In agreement with CBP, we will also install these systems at some number—that is still under discussion—of secondary screening operations at ports of entry in this country so CBP can look at these in terms of their suitability for operations.

So we have not yet committed to production. We did order some limited low-rate production units to get them into these test venues, but that is the only commitment we have made to date.

Mr. LANGEVIN. Let me get back to the issue of the cost-benefit analysis and the performance numbers.

Let me ask, in the cost-benefit analysis you assumed a 95 percent positive identification rate for highly enriched uranium, even though the test results for the ASPs was thought to vary from 70 to 88 percent.

In addition, in this test with HEU masked by benign, naturally occurring radioactive materials, the same ASP monitors dropped to 53, 45, and then 17 percent effectiveness.

In the last case, that means that dangerous material has passed through undetected 83 percent of the time. For that system to get to 95 percent effectiveness would require a 560 percent increase in performance.

So my question is, how can we justify characterizing those ASP systems as 95 percent effective? And are you actually expecting this level of performance?

And we assume by the use of this performance level on your cost-benefit analysis—do you intend to wait to deploy these units until they are 95 percent effective? And, if not, is it important to redo the cost-benefit analysis with actual performance data?

And then, if we could also speak to Dr. Aloise's overall inflated numbers, the issue he raised in terms of the cost, overall, of the system.

Mr. OXFORD. Sure. As a matter of methodology with DNDO, we anticipate doing some cost-benefit analysis early in the development cycle for any system. And it is to give us an initial gauge as to whether we are, what I will call, in the ballpark for continuing R&D.

But we always intend, as the system matures, to go back and redo any cost-benefit analysis based on the production readiness testing.

As I mentioned in the testimony, the tests in 2005 were not to prove 95 percent. That is our ultimate goal. It was to prove relative performance across the 10 contractors that we had under way to see whether we were in a reasonable ballpark for the maturity of the systems at that time. But we knew they were not fully matured to go into production.

So it was to down-select, as I mentioned, to go out in a full and open competition with those vendors and anybody else that wanted to bid to come up with those that we felt like could ultimately meet the 95 percent goal.

That is what we did with the previous test data. It was not focused on HEU alone. We tested against an array of dirty-bomb material, RDD material, NORM material, as well as HEU.

We used HEU as kind of the defining case for the CBA, as opposed to running multiple CBAs based on every potential detection capability or identification capability. But it was merely a gauge to show that we needed to continue the program, not to go into production at that time.

And we do intend to redo the CBA with the test results we are getting now, along with the other test venues that I have mentioned that will also look at operational suitability, in addition to the performance factors that we are shooting for in the 95 percent range, against that broad array of materials.

Mr. LANGEVIN. Mr. Aloise, is there anything that jumps out that you are concerned about, with respect to the questions I asked or the answers that Mr. Oxford gave?

Mr. ALOISE. Mr. Chairman, focusing on the cost-benefit analysis and the testing that was done, instead of using the test results that were developed during the test in the cost-benefit analysis, which was presented to us and the Congress as the basis for going forward, they used assumptions.

And I understand, I have heard many times, what the main purpose of those tests were: to down-select vendors. But the fact remains, that was the best data at the time, probably the only data at the time, on the performance of those ASPs.

There were 7,000 test runs done. There were PVTs set up along with the ASPs.

We are a fact-based organization, and we believe that cost-benefit analyses need to be based on facts. And they were the best facts available at the time, and we think they should have been used.

Instead, assumptions were used. It is always better to base analysis on facts than assumptions. And that is the bottom line, from where we are coming from.

Mr. LANGEVIN. Thank you.

I would now recognize the ranking member of the subcommittee, the gentleman from Texas, Mr. McCaul, for questions.

Mr. MCCAUL. Thank you, Mr. Chairman.

You know, in analyzing a cost-benefit analysis here, we have to look at the risk. The risk is enormously high. This is a high-risk game that you are engaged in. It is perhaps the highest risk. And the devastation that could come as a result of making a mistake—and we don't know if we have already made one.

So, having said that—and I don't want to be redundant, but I do want to try to maybe clarify some of the responses here—the ASP system, as I understand it, is a next generation, it is a better technology.

Mr. Oxford, tell me why this is a better technology, in your view. And how does it justify the cost that it presents to the American taxpayer?

And then I will turn it over to Mr. Aloise to answer the question, why do you think it is not justified in this case? And is it better judgment to stay with the current system of the PST technology?

Mr. OXFORD. Thank you.

And, again, the goal here is to really manage the risk as well as the operational burden at our ports of entry. The goal of the PVT systems was always to be able to alarm on any radiation that existed. But then it is a matter of, what do we dismiss and what kind of operational burden do we put on our front-line troops to be able to dismiss the nuisance issues versus actually deal with the threats that may present themselves?

So the PVT systems have sensitivity that will allow them to alarm; they just alarm on everything.

When we hand secondary screening into a system that relies on a hand-held device, a small hand-held device, which is a principal secondary tool that has a probability of correct I.D. of about 40 percent—and that is a proven performance over many periods of time, as opposed to the one test series that we have been talking this afternoon—we know that we have got a deficiency in the overall screening process, when you have got a combined systems performance of detection and I.D. in the 40 percent range.

What the ASP does, especially if we can get to this 95 percent goal, it combines PVT, in some cases, with the next-generation systems to give us high confidence we are not dismissing things that are a threat basis while also reducing CBP's workload and being able to dismiss the nuisance alarm.

Some of the numbers that are coming out of ports of entry right now are staggering, in terms of the number of people CBP is having to put against the secondary screening load. L.A.-Long Beach, for example, is averaging 400 to 500 alarms per day that has to go into secondary, now taking their CBP officers to resolve those alarms, because it is a protocol within CBP that they have to resolve every alarm. So, in some cases, they may not be doing other missions because of this secondary workload.

At the higher-volume locations, we ultimately, in agreement with CBP, want to put ASP in both primary and secondary just because of the sheer volume.

So the goal here is to be able to do not just detection; it is identification. Our probability of success is the probability of detection times the probability of identification. And what we are trying to do with ASP is significantly increase the probability of identification that is necessary to manage the threat and the workload at the borders.

Mr. MCCAUL. And you mentioned 95 percent detection rate, that is the goal in 2 years. Is that correct?

Mr. OXFORD. The goal of the ASP program is actually 95 percent identification.

Mr. MCCAUL. And at the Nevada test sites, you are conducting these tests currently. Is that right?

Mr. OXFORD. We have actually just completed those. We are in the data analysis phase for those tests.

Again, a full array of highly enriched uranium; weapons-grade plutonium; neptunium, which is another special nuclear material; as well as dirty-bomb material and an array of normal occurring material.

We will then supplement that with the stream-of-commerce testing in New York that will give us false-alarm rates against what they see daily at an operational port.

Mr. MCCAUL. And you will obviously factor that into your cost-benefit analysis when you get the results?

Mr. OXFORD. Absolutely.

Mr. MCCAUL. —when you have analyzed those.

Mr. OXFORD. When we redo the CBA, it will be based on that performance testing that we will then take to the secretary.

Mr. MCCAUL. Mr. Aloise, I want to turn it over to you.

Mr. ALOISE. Congressman, I want to make perfectly clear: GAO does not favor one type of portal monitor over another. Whichever works best for the country works best for us. And I know Vayl feels the same way.

What we are hoping for is that we are buying a margin of increased security, not a false sense of security. And that is where we are coming from when we look at the cost-benefit analysis, because we have not been convinced, looking at that specific analysis.

Mr. MCCAUL. Again, what is the most troubling aspect to you about this new technology, related to the cost?

Mr. ALOISE. Well, the fact is that it costs much more than the current technology. Each portal costs about $377,000 per portal, as opposed to $55,000 per portal.

So when we recommended that this analysis be done, what our point was: Is the margin of increased security worth the additional cost? Because there is a lot, as you know, there is a lot of homeland security needs, and it is all a matter of risk and how we portion out our scarce resources.

So what we were hoping to see in that cost-benefit analysis is that the increased security is worth the increased cost.

Mr. MCCAUL. I see my time has expired.

Thanks, Mr. Chairman.

Mr. LANGEVIN. I thank the ranking member.

The chair will recognize other members for questions they may wish to ask of the witnesses. In accordance with our committee rules and practice, I will recognize members who were present at the time of the hearing based on seniority in the subcommittee, alternating between majority and minority. Those members coming later will be recognized in the order of their arrival.

The chair now recognizes for 5 minutes the gentleman from Texas, Mr. Green.

Mr. GREEN. Thank you, Mr. Chairman.

And I thank the witnesses for appearing today.

Mr. Oxford, do you differ with the initial statement made by Mr. Aloise, his statements about the assumptions versus the actual empirical data that was available?

Mr. OXFORD. We don't really disagree on that factor. Again, we were using an assumption that was to guide our future decisions based on that goal of 95 percent.

When you look at some of the test data that has been quoted, it is against configurations. You would not expect passive detectors to work at all, so when we got 45 percent in some cases we were happy that we were able to detect anything on what turned out to be a fairly well-shielded configuration.

And I don't want to go into all the technical details, but passive detection performance is a function of distance velocity shielding, as well as the detector itself. So, in this case, we had test configurations that you would not have expected much performance with, and we were actually happy for those configurations to get the results we did.

So we did the CBA, again, as a guide to get us to a production decision in the future. But we still felt like we had to prove that 95 percent in tests that followed the ones that were referenced earlier.

Mr. GREEN. Are you sufficiently comfortable with your results, such that you would do it the same way given the opportunity to do it again? Or would his considerations cause you to rethink the methodology utilized?

Mr. OXFORD. I think I am very comfortable with the fact that we know, when we do an initial CBA early in the development of a program, that we have to gauge that based on what we think the maturity is at the time.

But we do not overuse the results of that analysis. Again, it was a gauge to say it was worth going into the engineering development phase, not production, for these systems and allow them to go through the next maturity cycle and then to redo the cost-benefit analysis based on performance testing that would lead us to production. And that is what we will go to the secretary with.

So getting a gauge early on that the systems are performing to the point for their maturity that makes sense was what we were trying to do with that CBA and the original testing.

Mr. GREEN. Mr. Aloise, could we in Congress have stipulated that empirical evidence by used, as opposed to assumptions? Could we have constructed this contract, if you will, such that we would have used different asset tests?

Mr. ALOISE. Yes, I mean, yes, you could have. But this was DNDO's attempt to do a cost-benefit analysis. And they do have very good guidelines to follow. In this case, in our view, they weren't followed.

Mr. GREEN. In your opinion, the guidelines in place were sufficient, it is just that they did not adhere to the guidelines?

Mr. ALOISE. Yes. DHS has got fairly good guidelines, we believe.

Mr. GREEN. Can you please give me a specific guideline that I can refer to and point to and say, "This one was not followed"?

Mr. ALOISE. Well, I don't have it with me, but I certainly could provide that to you.

Mr. GREEN. Would you please do so?

Mr. ALOISE. Yes.

Mr. GREEN. And it is your position—perhaps the term that I will use is too strong—but that guidelines were breached in the process?

Mr. ALOISE. In some cases, they were—I think, and I will have to check on this—but there were, like, seven major guidelines. They fully met one of them, and they partially met others, and they did not meet others at all. So we can certainly provide that to you.

Mr. GREEN. So, of the seven, five guidelines were not adhered to, in your opinion?

Mr. ALOISE. Fully adhered to.

Mr. GREEN. Fully. Does "fully" mean, to you, at least 80 percent adhered to or above or below?

Mr. ALOISE. I am probably not comfortable putting a percentage on it. But we looked at it: Did they fully meet these? Did they partially meet these? Or did they not meet these at all?

And so, we actually—I think it was actually one was fully met and six were either partially met or not met.

Mr. GREEN. Are we the avant-garde in this area? Is there any other country that is ahead of us in developing this technology?

Mr. ALOISE. This technology? I can only answer that based on my experience, which has been about 15 years working in this area. I would probably have to say the United States is in the lead. Russia does have—we have helped them stall their own equipment, but it is basically PVT-type equipment.

Mr. GREEN. And finally, you mentioned effectiveness. To achieve more than 95 percent effectiveness, am I understanding you correctly when you indicate that the cost is going up exponentially for 95 percent effectiveness?

Mr. ALOISE. Well, the cost of the new portals, at least during the time period we did our analysis of DNDO's analysis, was approximately $377,000 per portal for the new-generation portal. That did not include installation. The current portal is about $55,000. It may have increased since then 10 or 15 percent, plus installation. So there is a significant increase in cost for the new equipment.

Mr. GREEN. Mr. Oxford, do you agree with this?

Mr. OXFORD. Actually, I don't agree with much of that. We felt like we followed the guidelines. We have not heard any specifics that you have just asked for, so we would also be interested in the answer on what guidelines we didn't specifically follow, because we felt like we followed the DHS guidelines.

Regarding the cost factor, we have a fixed-price?

Mr. GREEN. Hold for just one moment.

Mr. Chairman, if I may ask, after we receive the information from Mr. Aloise, may we forward it to Mr. Oxford for his response, so that we can have an opportunity to view both sides of the concern, if you will?

Mr. LANGEVIN. Yes, absolutely.

Mr. Aloise, you would forward that to the committee?

Mr. ALOISE. I would be happy to, yes.

Mr. GREEN. Okay. Please, sir.

Mr. OXFORD. Secondly, let me quote a new number. The number for a cargo portal PVT system is $78,000. The $55,000 figure is for a pedestrian portal, not the cargo portal that we are trying to do the comparison with. So the $55,000 should be $78,000 in terms of what it cost to buy a cargo portal, which is different than what people walk through.

The installation costs are identical, so really it is the $377,000 versus about an $80,000 system that is the right comparison. We agree with that number. Installation costs are identical between the two kinds of systems.

Mr. GREEN. I yield back the balance of my time. Thank you, Mr. Chairman.

Mr. LANGEVIN. The chair now recognizes the gentleman from California, Mr. Lungren.

Mr. LUNGREN. Thank you very much, Mr. Chairman.

Mr. Oxford, you are the director of DNDO. Before that, you were the director of counterproliferation at the National Security Council. Before that, you were deputy director for technology development at the Defense Threat Reduction Agency. Before that, you were at the Defense Nuclear Agency, you were at the Defense Special Weapons Agency. Graduate of the U.S. Military Academy, Air Force Institute of Technology. Senior executive service, 1997; manager of the year award, 1997.

I would think you would know what you are supposed to do when you have something like this. And I am confused. And I don't want to insult either one of you here, because you are both doing your job, but if I were to take Mr. Aloise's statement on its face, you screwed up big-time. You did what you weren't supposed to do. You didn't follow your own proceedings. And you are kind of leading us down a big rat hole with a lot of money.

Why?

Mr. OXFORD. First of all, we don't think we are. I appreciate the heritage review.

We are committed, and I think Mr. Aloise has already pointed this out—we have talked—we want to do what is good for the country, between the two of us. I do think there is a legitimate difference of opinion as to what was intended in the past versus where we think we are going.

Mr. LUNGREN. Well, let me ask my question slightly differently. With all that experience you have had, you obviously have dealt with development of systems before. You have obviously developed cost-benefit analysis. You have obviously been involved in the ultimate costs of systems and going from the development to the production phase.

Is this substantially different from what you have done before? And if so, was there a reason that it was substantially different?

Mr. OXFORD. I can't tell you that in many of the experiences in DOD, they wouldn't even have done a cost-benefit analysis at the maturity level that we did our first one. Again, we used that as a guide. It was not the final cost-benefit analysis to allow us to start spending the big dollars.

Mr. LUNGREN. Years ago, I used to represent the L.A.-Long Beach ports. Now my district is 450 miles away, and I am up in Sacramento, but I have been to the L.A.-Long Beach ports. I have been up to the ports in Seattle.

I have seen the concerns expressed by other members of this committee that we are not moving fast enough to be able to screen and scan all of the pieces of cargo that are coming in at our ports, both land and water.

And so, there is no doubt there is a lot of pressure from Congress to get you guys moving. And what I am trying to find out is, is it because we are pressuring you to get moving faster that you did something that is different than you would normally do? Or is this the model that at least DNDO is adopting in order to get us to the production phase faster? And, if so, are there some risks involved because you are using estimates as opposed to facts?

Mr. OXFORD. Again, I don't think we would have done this differently because we have not yet made that production decision. Are we being aggressive? Yes. But we did not stop the other deployments.

The chairman and I had the chance to talk for the last couple years on this subject, where we shouldn't wait for new technology while keeping ourselves defenseless. That is why you see the performance and the improvement.

But we?

Mr. LUNGREN. But, at the same time, you have, what, 400 to 500 false alarms at L.A.-Long Beach. If you have been to that complex and seen the magnitude there, that is unacceptable. I mean, ultimately, we just can't do that sort of thing.

It is like anything else: The more times you have false alarms, the less alive people are to the real problem. And secondly, the manpower requirements are so great. And thirdly, you are going to interfere with commerce at that place if you do 400 or 500. You take them out when they should not be taken out.

So there is a real impetus to move in that direction.

Mr. Aloise, given that, is there another model? Or do you disagree with what Mr. Oxford is saying, that we can be aggressive in this way and have to, in some ways, because of the maturity of the development of the product, use assumptions to guide us for a cost-benefit analysis that we might recognize is not as pure or accurate as one would be if you were able to base it on facts that may not be revealed to you until a later date?

Mr. ALOISE. Congressman, we have thought about this a lot. We have had a lot of discussions. Vayl is right, we are working all toward the same goal.

It is our opinion that they did the cost-benefit analysis too soon. They didn't have the data they needed to do it.

Our recommendation was designed and it states—I am paraphrasing—that, "Before you do the cost-benefit analysis, accumulate as much information as you possibly can about the performance of the ASPs. Once you do that, once you know as much as you can know about them, then go do your cost-benefit analysis."

And before any major procurements occur, they ought to know if they work and how much they are going to cost. And that was the purpose of our recommendation, because of the large cost involved.

Mr. LUNGREN. Is there any dispute that the ASP technology is, by its very nature, better than—that is, an advance over the PVT?

Mr. ALOISE. If it works as advertised, it would be an advance over the PVT.

Mr. LUNGREN. Could I just ask one more question?

What I am asking is, the basic science involved: Is there any question about the science involved that ASP should be better than PVT?

Do you want to go first?

Mr. OXFORD. We are convinced that the sodium iodide technology specifically that is the mainstream of two of the three vendors is a well-known technology.

I will tell you one thing that DNDO is doing that has not been done in the detector community in the past is merge the signal processing, or the software community, with the detector community. The power here is in the software. And that is where the uncertainty of whether we get to 95 percent, where we can truly identify every specific isotope, is where the critical factors are. And that is why we have to test against real materials that we concern ourselves with.

There is no doubt in my mind that we will get there, but it will be through software upgrades. So the question that I will have at the end of these current tests: Is it good enough to begin the initial deployment while we continue to refine the software?

Mr. LUNGREN. Thank you very much, Mr. Chairman. Thank you for your indulgence.

Mr. LANGEVIN. I thank the gentleman for his line of questioning.

The chair now recognizes the gentleman from North Carolina, Mr. Etheridge.

Mr. ETHERIDGE. Thank you, Mr. Chairman.

And, Mr. Chairman, I didn't slip out because I thought we were being punished in here with the heat.

[Laughter.]

I noticed some people with handkerchiefs out, wiping.

Mr. LANGEVIN. I thought you folks in North Carolina liked it that way.

[Laughter.]

Mr. ETHERIDGE. Oh, man.

Mr. LUNGREN. Could we have a GAO report?

Mr. ETHERIDGE. We don't normally expect the heat in March, Mr. Chairman.

Mr. LUNGREN. Mr. Chairman, could we ask for a GAO report on the quality of the air conditioning in this room?

[Laughter.]

Mr. ETHERIDGE. Thank you.

Let me thank both of you for being here.

And thank you, Mr. Chairman.

And let me ask the question a little differently, because I think this is sort of the heart of what we are trying to get to.

Because, Mr. Oxford, in your written testimony, you state that DNDO always intended to validate its test before making production decisions.

However, it appears that the intent of DNDO is to quickly phase out the old systems that are pretty well proven, as you said earlier, that work.

And the reason I ask that question is—and replace it with ASP—is that the numbers I have been given—and this way I will ask a question, so hopefully I can get a clarification on it—the numbers indicate that, for 2007, the plan is to put over 150 monitors, with

90 percent of them being ASP. And in 2008, the plan not only increases the number, but it deployed—it is employed by 50 percent.

So my question is this: You know, as we talk about totally phasing out the other one before we have got this stuff, it seems to be a disparity between these figures, the low-rate production contract and DNDO's claim that the office is still in a research phase.

Has a decision been made—I assume it has, or has it—on ASP even before testing is complete?

And, number two, given that there are still technological hurdles, as you have indicated, to overcome, would it make sense to phase in the change over a longer period of time, since we don't have the answers to the questions at this point?

I will give you a chance to clear that up, if you would, please.

Mr. OXFORD. Thank you very much.

What we did, upon contract award, is we did order 80 low-rate production units, but that was primarily to fit into this test protocol that I have mentioned before, the various test venues. It takes several units to do that.

The rest of the units you have talked about are on hold pending a secretarial certification. So we are not buying any additional systems until we complete this?

Mr. ETHERIDGE. Tell us what "secretarial certification" means.

Mr. OXFORD. The 2007 appropriations act requires that we have the secretary certify performance, that we are getting a significant increase in performance from these systems, before we go into production. That is a criteria that we are living with, so no other systems are being procured until such time as we come out of this test series and the secretary makes that decision.

In addition, we are not really phasing out the old systems. We have a deployment strategy with CBP that we will rely on into the future, a mix of current-generation and the next-generation systems, based on the volume, the workload, the threat basis.

But, again, that is worked directly in conjunction with CBP. So, in some cases, if we go in and install an ASP system where a current PVT system is, we will take that out, refurbish it and relocate it, based on the deployment strategy we have with CBP.

Mr. ETHERIDGE. All right.

Given that, in your testimony, Mr. Oxford, you say that you plan to work with the GAO to foster better understanding of development, acquisition and testing approaches.

My question is, what steps have you taken to do that?

Mr. OXFORD. We have had an additional entry meeting with Mr. Aloise's people. They have asked for a series of documents. They have posed questions to us. They have seen now—we have provided, it should be in their hands—I know we have released it—the test plan for the testing that was going on at the Nevada test site, so they can fully see how we are doing the testing, what we are testing against. Meanwhile, we are answering a series of additional questions that will result in continued dialogue in this area.

Mr. ETHERIDGE. Mr. Aloise, do you see DNDO taking step to change its procedure? And what specifically do you think they need to do to further improve the process? Because we want to help. That is our role; we want to help. So I hope you will share that with us.

Mr. ALOISE. I think the better communication that we have established between Vayl and I will help on that level. In terms of the equipment itself, we are going to be looking at the test results from the test that is being conducted now and we will be conducting again shortly. And we will look at the protocols, we will look how the tests have been conducted, and then we will see how the information is used.

Mr. ETHERIDGE. Mr. Chairman, I would hope that, as this moves along—because we are talking about a critical issue, and a lot of resources being applied to it—that this committee would be informed of that as it moves along.

Mr. LANGEVIN. I agree.

Mr. ETHERIDGE. Thank you. I yield back.

Mr. LANGEVIN. Thank you.

Well, I want to thank the witnesses for their valuable testimony, the members for their questions.

I know, as we have all acknowledged, you both are working for the good of the American people. And, obviously, we have a very difficult job to do. As we have said, we have to get it right all the time; the terrorists only have to get it right once. And I know that you all are working very hard to protect the nation, and we are grateful for your service.

Just on a personal note, I have had the opportunity to travel, as you know, Mr. Oxford, to the nuclear test facility in Nevada. It is an impressive operation, and I know it will only get better with time.

I have been out to the port of Long Beach and had the opportunity to see the nuclear detection equipment in operation. And that, too, is an impressive operation.

And we want to do what we can to work with you to improve, as time goes on. We hope that today's give-and-take has been helpful. It certainly has been for me, and I think the other members agree. Hopefully it will get better in time.

Certainly, Mr. Aloise, I look forward to having you forward the criteria to us, and we will get that to DNDO, and look forward to further dialogue.

Again, I want to thank the witnesses for their testimony. If the members of the subcommittee have any additional questions for the witnesses, we will ask that you respond expeditiously in writing to those questions.

And hearing no further business, the subcommittee stands adjourned.

[Whereupon, at 3:23 p.m., the subcommittee was adjourned.]

# EVALUATING THE DEPLOYMENT OF RADIATION DETECTION TECHNOLOGIES PART II

**Wednesday, March 21, 2007**

U.S. House of Representatives,
Committee on Homeland Security,
Subcommittee on Emerging Threats, Cybersecurity,
and Science and Technology,
*Washington, DC.*

The subcommittee met, pursuant to call, at 3:08 p.m., in Room 1539, Longworth House Office Building, Hon. James Langevin [chairman of the subcommittee] presiding.

Present: Representatives Langevin and McCarthy.

Mr. Langevin. [Presiding.] The subcommittee will come to order.

The subcommittee today is meeting to receive testimony on "Countering the Nuclear Threat to the Homeland: Evaluating the Deployment of Radiation Detection Technologies."

Good afternoon, everyone. I want to welcome you to today's hearing, "Countering the Nuclear Threat to the Homeland: Evaluating the Deployment of Radiation Detection Technologies."

Before we begin with the substance of the hearing, I would like to just take a minute to say a few words about the committee rules regarding testimony.

Our committee rules require that the testimony be submitted 48 hours before the hearing, and this is intended to allow all members the opportunity to read through the entire testimony, which is usually longer, obviously, and more detailed than the 5-minute summary that witnesses are afforded at the hearing.

For today's hearing, we received one testimony last night, about 6 p.m., and the other today, about 10:30, only a few hours before the hearing. And it is difficult to do business this way, and I would rather not have this happen in the future.

I realize that the fault doesn't lie entirely with our witnesses and that clearing testimony through OMB is a slow and torturous process sometimes and that we need to figure out a way to speed up OMB, which probably an impossible thing to do, and get the testimony in with a couple days to spare.

So we want to make, obviously, the most productive use of your time and ours, and we appreciate your help in the future on that.

Now, turning back to the substance of today's hearing, this subcommittee is tasked with one of the most daunting challenges that confronts our society today: securing our nation from terrorists who are constantly thinking of new and innovative ways to harm us.



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Because of nearly unimaginable consequences associated with the success of a nuclear attack, there is broad agreement that the threat of nuclear terrorism must be one of our top priorities.

Last week, we heard from Director Oxford on our efforts to procure radiation detection equipment, and today we will focus on where this critical technology is being deployed along our many ports of entry.

I would like to thank Mr. Oxford for taking the time once again to come before us and dialogue with us again today. I understand that your schedule must obviously incredibly tight these days, but the subcommittee really appreciates you being here once again.

Last Congress, our predecessor Subcommittee on Prevention of Nuclear and Biological Attack held numerous hearings to examine the areas where we are most vulnerable to nuclear attack. I believe that we have made significant strides to close some of the existing gaps, but there is still much work ahead of us.

We must continue to focus our efforts on a three-pronged comprehensive approach, encompassing prevention, detection and response to fully secure our nation from nuclear attack. Clearly, intelligence is the best tool that we have to prevent any terrorist attack, including a nuclear one, but, as we all know, intelligence is not always reliable, so we must ensure that we have other robust tools at our disposal.

Now, we have all heard the most likely scenario, that a terrorist could build a crude nuclear device abroad and then attempt to smuggle it into the country. Well, we must continue to focus our efforts on securing nuclear material abroad, but we must also deploy the best available detection technology at every port and point of entry into this country.

Our radiation portal monitors are our last best chance to prevent catastrophic nuclear or radiological attack. Over 90 percent of the world's trade moves in cargo containers, with 20 million containers arriving at U.S. ports of entry annually. This highlights just how important it is that we have adequate detection devices at all of our seaports and borders.

And while we have done a good job of deploying this lifesaving technology at our most heavily trafficked points of entry, we must work to deploy it on every point, even those less populated.

I was happy to see that the supplemental appropriations bill to be considered this week includes $100 million for customs and border protection to be used for up to 1,000 additional personnel for its mission.

The bill also includes $400 million for the Domestic Nuclear Detection Office to continue to acquire and deploy radiation portal monitors.

Director, so far you have made good progress. As of February 2007, radiation portal monitors were scanning 100 percent of all U.S. mail, 89 percent of all cargo entering through our U.S. seaports, 96 percent of cargo at the southern border and 91 percent at the northern border, with expected increases to 97 percent at seaports and 99 percent at the southern border by the end of 2007.

And just to pause for a second, to be clear, this is scanning, not inspections, which are different. It is a separate issue, but we are making progress.

In order to scan this much cargo, roughly 1,000 RPMs have been deployed. Future deployed designed to scan 100 percent of all conveyances will require an additional 1,500 to 2,000 units over a deployment schedule through fiscal year 2013.

And I would like to make sure that current and future appropriations will give you the resources that you need and personnel and equipment to complete this important mission, and I would also like to hear from our witnesses about, in genera, where this technology will be deployed in the future, particularly in some of the less populated areas along the northern border.

We can delve into some of the specifics in a closed session, off the record, at a later time, but, in general terms, I would like to address those.

We must also ensure that CBP and DNDO are working together effectively on this mission. These two agencies must continue to partner and corroborate on how best to deploy this lifesaving technology, and I look forward to hearing both from Mr. Ahern and Mr. Oxford on how they are working toward this end.

I want to thank both of our witnesses for being here today, and I look forward to a discussion of these issues.

The gentleman from Texas, Mr. McCaul, is on his way. When he does arrive, we will pause and allow him to make his opening statement, and other members of the subcommittee will be allowed to submit opening statements for the record at a future time.

To our witnesses, I want to welcome you both here today.

Our first witness, Mr. Vayl Oxford, is the director of the Domestic Nuclear Detection Office, a position that he has held since April of 2005. DNDO serves as the primary entity for the United States government to improve the nation's capability to detect and report an authorize 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.

Our second witness, Mr. Jayson Ahern, is the assistant commissioner of the Office of Field Operations, U.S. Customs and Border Protection, a position that he has held since March 2003. He manages an operating budget of $2.5 billion and directs activities of more than 24,000 employees. In that capacity, he oversees national programs and operations at 20 field operations offices, 326 ports of entry, 50 operational Container Security Initiative ports worldwide.

So, without objection, the full witnesses' statements will be inserted into the record.

I welcome you both here today, and I ask each witness to summarize your testimony, beginning with Mr. Oxford.

Welcome, gentlemen.

**STATEMENT VAYL OXFORD, DIRECTOR, DOMESTIC NUCLEAR DETECTION OFFICE, DEPARTMENT OF HOMELAND SECURITY**

Mr. OXFORD. Good afternoon, Chairman Langevin. I am happy to be here again this week.

As you know, DNDO is not only responsible for developing new technologies but works with CBP in the deployment of detection systems to our ports of entry.

I would like to thank the committee for the opportunity to discuss how we are going about deployment to the northern and southern land borders. I am also pleased to be here with my colleague, Assistant Commissioner Ahern, who works with me, and our teams work very closely together.

A lot of recent emphasis has been placed on deployment of radiation detection equipment to our seaports. This is an essential step in securing our nation, but it is only part of a broader strategy to provide detection capabilities to all POEs.

By the end of 2007, our goal is to scan 98 percent of all maritime containers entering the U.S. We are closely coupled with CBP in this regard. We have developed a joint program execution plan that both Mr. Ahern and I have signed to indicate our joint venture in this area.

Overall, we are making good progress on the northern and southern land border deployments. Two years ago, less than 40 percent of incoming container ICE cargo was being scanned for radiological and nuclear threats at our land borders. Today, there are 241 RPMs operating on the northern border, 329 RPMs on the southern border. This results in 91 percent container ICE cargo coming across the northern border being scanned and 96 percent coming across the southern border.

We are also conducting screening of privately operated vehicles. We currently scan 81 percent of the POV traffic coming across the northern border as well as 91 percent across the southern border.

These metrics tell a positive story, but a lot of work remains. We have about 50 percent geographic coverage across the northern and southern border. Of the 611 RPMs required on the northern border, about 40 percent are in place. Likewise, of 380 required on the southern border, 88 percent are in place.

Our strategy has been to focus on volume. Our priority remains to finish deploying RPMs to high-volume seaports and land crossings. However, our future plans do address the smaller crossings that dot the northern and southern borders, to include rail crossings. We will also begin screening of international air cargo. We plan to deploy 165 RPMs in 2007 and 274 RPMs in 2008 to both seaports and land crossings.

We have prioritized installations based on risk, vulnerability or consequence, as influenced by population, industries, imports to the economy and the supply chain, as well as any key installations that are nearby. Finally, we consider whether locations have planned port reconfiguration.

To prepare for additional deployments, we are already conducting site surveys, developing site designs and starting negotiations to award construction contracts for each of these future crossings.

Meanwhile, we are also increasing focus on threats entering the United States between our POEs. We are working with the Border Patrol to develop a joint strategy to provide improved detection capabilities to their agents. They require mobile applications in addition to connectivity so that alarm data can be communicated and resolved quickly.

We are developing improved human portable systems at the Border Patrol, as well as the Coast Guard and Navy. As a point, the deployment of radiation detection equipment capabilities to all Coast Guard boarding teams will be complete by the end of 2007.

In conclusion, DNDO is acutely aware that we must continue to deploy systems to our seaports and our northern and southern land borders. We are working closely with our users to deploy these systems. DNDO is committed to providing the capabilities needed to successfully detect and respond to radiological and nuclear threats.

Mr. Chairman, this concludes my prepared statement. I will be glad to answer any questions you might have.

[The statement of Mr. Oxford follows:]

PREPARED STATEMENT OF VAYL S. OXFORD

WEDNESDAY, MARCH 14, 2007

***Introduction***

Good afternoon, Chairman Langevin, Ranking Member McCaul, and distinguished members of the subcommittee. 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 how we are testing and evaluating next-generation technologies. In particular, I would like to describe the certification process, required by the FY 2007 Appropriations bill that the Advanced Spectroscopic Portals (ASPs) will undergo before we commit to purchasing and deploying the systems.

DNDO recognizes that there were concerns raised in the Government Accountability Office (GAO) report entitled, *"Combating Nuclear Smuggling: Department of Homeland Security's Cost-Benefit Analysis to Support the Purchase of New Radiation Detection Portal Monitors Was Not Based on Available Performance Data and Did Not Fully Evaluate All the Monitors? Costs and Benefits,"* dated October 12, 2006. Nonetheless, we stand behind the basic conclusions of the cost benefit analysis (CBA). We realize there may have been a misunderstanding as to the intent of certain test series, the types of data collected, and the conclusions that were drawn. It is my hope that the information we provide today, including our path forward for the ASP program, is testament to the careful consideration we have given to our investments in ASP systems and, in turn, the GAO's concerns pertaining to next-generation technology.

I would like to make it clear that DNDO remains committed to fully characterizing systems before deploying them into the field. This is a founding principle of our organization and we maintain a robust test and evaluation program for this purpose.

Before I go into more detail about our test program and the upcoming certification of ASP systems, I would like to highlight some DNDO accomplishments which have occurred since I last appeared before this committee.

*DNDO Accomplishments and Activities*

As we continue to test and develop radiation portal monitors (RPMs) for use at our ports, we are also expanding security beyond our ports of entry. In FY2007, DNDO will develop and test several new variants of passive detection systems based upon ASP technology. These include a planned retrofit of existing CBP truck platforms, commonly used at seaports, and the development and performance testing of an SUV-based prototype system suitable for urban operations, border patrol, and other venues.

The Systems Development and Acquisition Directorate is also executing the first phase of engineering development associated with the development of the Cargo Advanced Automated Radiography Systems (CAARS) system. A dominant theme within the nuclear detection community is that comprehensive scanning for smuggled nuclear materials requires both automated passive technologies and automated radiography systems. While ASP is DNDO's next generation passive detection system—providing an enhanced probability of success against unshielded or lightly shielded materials; CAARS will complement the ASPs by providing rapid automated detection of heavily shielded materials that no passive system can find. These two systems must function together to successfully detect nuclear threats at our Nation's ports. The three contractors selected by DNDO will proceed with system design and development efforts this year—including the development of many of the critical hardware and software components. DNDO, in coordination with Customs and Border Protection, will prepare the first CAARS deployment plan—describing in detail, where and how the CAARS units will be initially deployed, as well as a preliminary CAARS Cost Benefit Analysis and radiation health physics study.

DNDO also continues to develop handheld, backpack, mobile, and re-locatable assets with improved probability of identification, wireless communications capabilities, and durability. One specific goal is to deploy radiation detection capabilities to all U.S. Coast Guard inspection and boarding teams by the end of 2007. DNDO awarded contracts to five vendors in October 2006 for development of Human Portable Radiation Detection Systems (HPRDS), each of which will develop a HPRDS prototype unit. One promising HPRDS technology is the introduction of a lanthanum bromide detection crystal that may provide an extremely effective threat material identification capability along with a low false alarm rate. DNDO will also pursue research and development to standardize the flow of data to ensure rapid resolution of spectra acquired in the field, that need further validation as a threat or benign substance.

With regard to Advanced Technology Demonstrations (ATDs), DNDO will further develop the existing and proposed ATDs in FY 2007. We held the first preliminary design review of Intelligent Personal Radiation Locator (IPRL) on February 28th. Further critical design reviews of the IPRL ATD will be conducted in mid-FY08, to be followed by performance testing and cost-benefit analysis in late-FY08 and early-FY09. An additional ATD for Standoff Detection will also be initiated in FY2007. Under this ATD, various imaging techniques will be evaluated for sensitivity, directional accuracy, and isotope identification accuracy with a goal of extending the range of detection to as much as 100 meters, enabling a new class of airborne, land, and maritime applications.

The Exploratory Research program is continuing to work in support of future ATDs to understand and exploit the limits of physics for detection and identification of nuclear and radiological materials as well as innovative detection mechanisms. A few examples of exploratory topics include a new technique that would extend the ability of passive detectors to verify the presence of Special Nuclear Material (SNM) through shielding and creation of new detector materials that would perform better and cost less than current materials.

DNDO, in collaboration with the National Science Foundation (NSF), is beginning the Academic Research Initiative to fund colleges and universities to address the lack of nuclear scientists and engineers focusing on homeland security challenges through a dedicated grant program. A NSF survey shows a downward trend since the mid-1990s of nuclear scientists and engineers in the United States of approximately 60 per year. In 1980, there were 65 nuclear engineering departments actively operating in the U.S. universities; now there are 29. Currently, it is estimated that one-third to three-quarters of the current nuclear workforce will reach retirement in the next 10 years. Projections forecast the requirement for approximately 100 new Ph.D.s in nuclear science per year to reverse these trends and support growing areas of need. In order to address this requirement, the DNDO and NSF recently issued a solicitation for the Academic Research Initiative, which will provide up to $58M over the next five years for grant opportunities for colleges and universities that will focus on detection systems, individual sensors or other research relevant to the detection of nuclear weapons, special nuclear material, radiation dispersal devices and related threats. DNDO's Operations Support Directorate provided Preventative Rad/Nuc Detection training to 402 operations personnel in six state and local venues in FY 2006. We sponsored, designed, developed, and conducted the New Jersey multi-jurisdictional rad/nuc prevention functional exercise, Operation Intercept, in September 2006, with approximately 60 players (operators, law enforcement, fire/hazmat, intelligence analysts, etc.). DNDO's FY2007 goal is to train 1,200 State and local operators in Basic, Intermediate and Advanced Preventive Rad/Nuc Detection courses. DNDO Training and Exercises activities will also support DHS planning for the TOPOFF 4 full-scale exercise to be held in 4th Quarter FY 2007. DNDO is coordinating closely with other Federal agencies and State and Locals in developing radiological/nuclear scenarios.

The Southeast Transportation Corridor Pilot (SETCP) was initiated this past year to deploy radiation detection systems to interstate weigh stations. SETCP provided detection technologies (radiation portal monitors and mobile and handheld detection equipment) to five of the nine participating States in 2006, and this year we will equip the remaining states. Also, this year we plan to conduct a multi-state SETCP functional exercise using the weigh stations, the Southeast Regional Reachback Center, and the Joint Analysis Center (JAC).

The Securing the Cities (STC) Initiative is moving forward as we work with New York City (NYC) and regional officials (led by the New York Police Department) to develop an agreed-upon initial multi-jurisdictional, multi-pathway, defense-in-depth architecture for the defense of the NYC urban area. DNDO will conduct an analysis-of-alternatives for the deployment architecture, develop equipment specifications to address the unique needs of urban-area detection and interdiction, and develop and test these detection systems.

In FY 2006 a program to enhance and maintain pre-event/pre-detonation rad/nuc materials forensic capabilities was funded within the DHS S&T Directorate. That program transferred to DNDO on October 1, 2006. Concurrently, the DNDO established the National Technical Nuclear Forensics Center (NTNFC) to serve as a national-level interagency stewardship office for the Nation's nuclear forensic capabilities. Staff for this office includes experts from DHS, DoD, FBI, and DOE. Agencies are working together in a formal interdepartmental forum consisting of a senior level Steering Group and Working Groups for centralized NTNF planning, integration, and assessment. FY 2007 planned accomplishments include developing a strategic NTNF program plan and associated concept of operations (CONOPs) for rad/nuc forensics. These documents will describe and detail the roles and responsibilities of, and interactions between Federal agencies involved in the detection, collection, and forensic analysis of radiological/nuclear material(s) and device(s). DNDO will also establish a National Technical Nuclear Forensics (NTNF) Knowledge Base. This knowledge management program will include the creation of a knowledge base and analysis tools to support the timely and accurate interpretation of nuclear forensics data and information sharing among partners.

*Benefits of Next-Generation Detection Technology*

Now, I would like to discuss the ASP Program and our efforts in reference to the Cost Benefit Analysis and the steps required for certification. Our desire to introduce next-generation radiation portal monitors (RPMs) into screening operations stemmed from inherent limitations in the current-generation polyvinyl toluene (PVT) detectors. PVT detectors can detect the presence of radiation but cannot identify the specific isotopes present. Currently, CBP relies on hand-held radio-isotope identifier devices (RIIDs) during secondary screening to provide isotope identification capability. Introduction of isotope identifying ASP technology in secondary screening applications will greatly increase the overall effectiveness of CBP screening. PVT portals installed for primary screening will effectively alarm on all sources of radiating material. This unfortunately includes nuisance alarms such as granite tiles, ceramics, kitty litter and other naturally occurring radioactive material (NORM). Next-generation technology will improve upon the identification capabilities of current systems, and minimize the diversion of trucks and containers filled with legitimate commerce to a secondary inspection area where CBP Officers conduct a rather time-consuming, thorough investigation prior to release of the vehicle. This technology will be especially important for high volume or high NORM rate POEs, as it will lessen the burden on secondary inspection stations and the associated impact to the stream of commerce and CBP. Spectroscopic systems, like ASP, that use the signature of the radiation to make a simultaneous "detection and identification" decision provide one possible solution to this problem. However, further development and testing is required to resolve some remaining issues concerning the use of ASPs in primary, such as the potential masking of SNM by a large NORM signature.

In accordance with DHS Investment practice, DNDO executed a classic systems development and acquisition program for ASP. Namely, DNDO implemented a program that consisted of concept evaluation, prototype development and test, an engineering development phase, a low-rate-initial production phase—and eventually a full-rate production phase.

During the concept development phase, DNDO issued a Broad Agency Announcement to industry—and competitively awarded ten contracts for the development of prototype units. DNDO then tested the prototype units in the winter of 2005, again during the concept development phase of the program, and used these test results as part of the competitive source selection process to select vendors to proceed with engineering development. Subsequent to the award of three ASP engineering development contracts to Thermo-Electron Corporation, Raytheon Corporation and Canberra Industries, DNDO directed the development of one ASP Engineering Development Model—or EDM—designed and built with the rigor necessary to be found suitable for production. Production Readiness Testing, including System Performance Testing against significant quantities of SNM at the Nevada Test Site, Stream-Of-Commerce Testing at the New York Container Terminal, and System Qualification Testing, which includes shock, vibration, and other environmental testing, is being conducted as we speak.

As I address many detailed concerns—I think it is very important to preface my statements by reiterating that the Winter 05 prototype test was never intended to be a production readiness test—nor a formal developmental test. The tests were designed to facilitate the competitive process by selecting those vendors that would receive further engineering development contracts, based in part, on the performance of their prototype systems. Much of the perceived confusion with regard to ASP performance stems from a miscommunication with regard to what the test results mean and what they do not mean and the complete evaluation process for ASP.

*Cost-Benefit Analysis*

Let me briefly address the ASP cost-benefit analysis. As I mentioned earlier, DNDO developed a first-cut cost benefit analysis (CBA) in the concept development phase of the ASP Program. Many DHS programs, such as ASP, produce a CBA in the concept development phase and subsequently update it as part of what the Department has referred to as Key Decision Point Three—the full-scale full-scale production milestone decision. An initial CBA (based simply upon studies, analyses, and modeling results) is required for all DHS investments during the concept development phase to determine whether further R&D investment is prudent.

The CBA fundamentally considered five different alternative configurations of radiation detection equipment at a CBP Ports of Entry. Specifically, the alternatives included:

#1—referred to as the 'status quo' alternative consisted of the use of a current-generation PVT-based RPM in what is referred to as 'Primary Inspection' coupled with a second such system in secondary inspection—along with a current generation handheld device used for identification.

#2—referred to as the "adjusted threshold" alternative; is identical to alternative #1 except that the PVT systems are set to their maximum sensitivity and, hence, experience the highest false alarm rate

#3—referred to as the 'enhanced secondary' alternative; consists of a current-generation PVT-based RPM system in primary with an ASP Portal in 'secondary'.

#4—referred to as the 'hybrid' alternative where ASP systems are deployed in primary and secondary locations for high volume and high NORM rate POEs and PVT systems are used in Primary with an ASP in secondary for medium and low volume ports

And #5—referred to as the 'All ASP' alternative; consists of placing ASP in both primary and secondary inspection areas.

Each alternative was evaluated on the basis of probability to detect and identify threats, impact on commerce, and soundness of the investment.

The preferred alternative recommended by the CBA was a hybrid approach consisting of ASP systems for primary screening at high-volume ports of entry (POEs), PVT systems for primary screening at medium and low-volume POEs, and ASP systems for all secondary screening. The DNDO/CBP Joint Deployment Strategy describes the way in which the mix of PVT and ASP portals would be deployed to maximize the benefit of ASP, while minimizing the cost. We plan on initiating a phased installation by first installing the monitors for secondary inspection. This will allow CBP to gain operating experience and allow time to further evaluate the ASPs as a primary inspection tool.

DNDO met on multiple occasions with the GAO staff to discuss the CBA methodology, assumptions, data sources, and results and the fact that this was an initial CBA, suitable for the Concept Development phase of a program. We worked extensively with the GAO to further refine the CBA and provided written responses to the GAO documenting the technical rationale for DNDO's approach.

Nonetheless, confusion remained about our prototype test activities. Specifically, the GAO criticized DNDO for assuming a probability of detection of 95 percent, even though the Winter-05 test results did not show this same capability. Once again, as I mentioned above, the Winter-05 test results cited by the GAO were not intended to determine the absolute capabilities of deployed systems; rather, they were intended to support initial source selection decisions. We remain committed to high fidelity testing and are currently conducting a complete set of System Performance tests prior to ASP Full Rate Production.

The GAO reported that DNDO tested the performance of PVT and ASP systems side-by-side, but did not use these results in the CBA. Again, the test series referenced was not intended to provide an objective side-by-side comparison of PVT and ASP systems; it was intended solely to provide an objective side-by-side comparison of the competing vendors' prototypes. While the Winter-05 Tests were aimed at ASP source selection, it is the tests we are conducting now—the Winter-06 Tests—that are aimed specifically at assessing the cost-benefit associated with ASP and will therefore provide an ASP and PVT and Handheld side-by-side analysis that one would expect to see at this point in the program.

The GAO also stated that the CBA only evaluated systems' ability to detect highly enriched uranium (HEU) and did not consider other threats. DNDO agrees that threats other than HEU are equally important—and our Winter 06 test is evaluating the Production ASP units against a full set of Special Nuclear Materials—including those that might be used for an improvised nuclear devise and those that might be used for a radiological dispersal device.

We agree with the GAO that further test and evaluation of ASP systems must occur. Indeed, DNDO always planned on validating its assumptions through further testing prior to making a production decision.

Upon the successful completion of its ASP evaluation, DNDO intends to request Key Decision Point Three (KDP–3) approval—that is permission to enter full rate production of ASP—in the summer of this year. Our request will be based upon completed and documented test results from test campaigns to be conducted at NTS, NYCT, and at contractor facilities; as well as interim results from deployment integration testing to be conducted at the Pacific Northwest National Laboratory (PNNL) Integration Laboratory (frequently referred to as the 331G facility), and one or more field validation efforts in which an ASP unit is installed in "secondary screening" at an operational POE in tandem with existing approved interdiction systems.

The test results from this campaign will facilitate the Secretary's certification decision that is called for in the FY 2007 Homeland Security Appropriations Act (P.L. 109–295). DNDO will commit to full-rate production only after we are confident that ASP systems significantly upgrade our detection capabilities and operational effectiveness and that they meet the Department's goal to protect our Nation from dangerous goods. DNDO will use a combination of cost-benefit analyses as well as demonstrated performance metrics to assist in the Secretary?s certification decision.

*Contract Awards for ASP*

As I have stated earlier, one of our major accomplishments this past year was issuing Raytheon Company—Integrated Defense Systems, Thermo Electron Company, and Canberra Industries, Inc. contract awards for engineering development and low-rate initial production of ASP systems. Initial ASP contract awards totaled approximately $45 million. The priority for the base year is development and testing of the fixed radiation detection portal that will become the standard installation for screening cargo containers and truck traffic. The total potential award of $1.2 billion, including options, will be made over many years, based upon performance and availability of funding.

*Future Deployment*

DNDO intends to deploy ASP systems to the Nation's POEs based on the Joint Deployment Strategy I referenced earlier. In addition, ASP systems will be deployed overseas through the Department of Energy's (DOE) Megaports Initiative to work in cooperation with currently deployed PVT—based radiation portal monitors in those venues. DOE has purchased ASP units for use with MegaPorts from DNDO?s existing contract.

*Conclusion*

DNDO is improving capabilities in detection and interdiction of illicit materials, intelligence fusion, data mining, forensics, and effective response to radiological or nuclear threats. It is the intention of DNDO to fully test and evaluate emerging technologies, in order to make procurement and acquisition decisions that will best address the detection requirements prescribed by the Global Nuclear Detection Architecture. We work with our interagency and intra-agency partners to ensure that deployment and operability of our systems enhance security and efficiency without unnecessarily impeding commerce.

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

Mr. LANGEVIN. Thank you, Director.

Mr. Ahern?

**STATEMENT OF JAYSON AHERN, ASSISTANT COMMISSIONER, OFFICE OF FIELD OPERATIONS, CUSTOMS AND BORDER PROTECTION, DEPARTMENT OF HOMELAND SECURITY**

Mr. AHERN. Thank you very much, Mr. Chairman. And thank you for the opportunity to discuss today with you the U.S. Customs and Border Protection's use of the technology that we partner with

DNDO on and also the unprecedented mission, as we have, to meet our twin goals of facilitating legitimate travel and trade coming to this country, all the while securing the nation's borders.

As you know, we use a multilayered strategy, and I believe you have had an opportunity to see some of that firsthand, particularly in Los Angeles–Long Beach. And I think it certainly is important for the folks at this hearing for me to just look at one of these layers and that is the use of our technology, principally, the Radiation Portal Monitor Program that we have been partnering with DNDO.

I think it is certainly important to talk about the advancements that we have done in partnership with DNDO. When I take a look, I look back to when I first came to headquarters in 2002 and we had no radiation portal monitors in a post-9/11 environment, and we had the very first one in Detroit. And I look at today, we have over 966 of the RPMs deployed at our nation's borders.

Mr. Oxford talked about the ones we have in the northern and southern border environment. I also would want to mention that 89 percent of the containers coming into this country today in the maritime environment are actually being scanned through the radiation portal monitors before they are entered into the commerce of the United States.

Just 12 months ago, during the height of the Dubai Port World issue, we were only at 37 percent, so there has been significant progress in that vector over the last 12 months, I am proud to report on that.

Certainly, as you take a look at the transition and the relationship we have had, you know, in fiscal year 2006, the transition of the procurement went to DNDO, as they were established, and we have maintained a very strong relationship and collaborative role with them on developing the project execution plan with Director Oxford and his staff.

As we take a look, we are going to continue to evolve through our radiation strategy, taking a look at the next generation systems and how they can be integrated to continue to streamline cross-border traffic that is so critical, particularly when you take a look at the land border environment. It is a very time-sensitive environment that we need to make sure that we continue to have good throughput and capacity through those ports of entry.

And just by reference, I think it is important, in all the environments, we have put 151 million conveyances through the RPMs since we have stood them up over the last few years, and we have had to resolve over 800,000 alarms to radiation.

As we take a look at evolving, as we go forward, and, certainly, if you recall your experience out in L.A.–Long Beach, that equates to about 400 to 500 alarms a day in one port alone in the place of Los Angeles–Long Beach. So we need to work forward with better protocols, continuing to look at next generation technology to identify what the ICE scope is so we can actually hone our efficiency down and make our twin goals as productive as we possibly can.

Just briefly, I would like to talk about something that I think is very important for us within DHS. You know about the Container Security Initiative, currently 50 ports overseas. We have 82 percent of the container traffic where we have an opportunity to do some overseas scanning as one of our layers. We will be at 58 ports, covering 85 percent by the end of this year.

I think the critical thing to talk about, though, is, with the passage of the Safe Port Act, Secretary Chertoff announced in December of this past year that we would be looking at deploying detection capabilities as part of an overall technological package overseas at three key ports that ship to the United States.

I think that will give us an essential learning opportunity so that we can determine whether or not feasibility of 100 percent scanning overseas is something that is realistic and doable, and we will learn a lot from these tests that we will be starting with in the next couple of months, and we will be happy to report on those in the future, as we go forward.

I think for the sake of time I will conclude at this point in time and look forward to any questions you might have for us.

[The statement of Mr. Ahern follows:]

PREPARED STATEMENT OF JAYSON P. AHERN

WEDNESDAY, MARCH 21, 2007

**INTRODUCTION**

Good morning Mr. Chairman and distinguished Members of the Subcommittee. Thank you for this opportunity to discuss with you today U.S. Customs and Border Protection's (CBP) efforts to both strengthen the security of cargo entering our borders and facilitate the flow of legitimate trade and travel.

Let me begin by expressing my gratitude to the Committee for the strong support you provided for important initiatives implemented by CBP last year. Your support has enabled CBP to make significant progress in securing our borders and protecting our nation against the terrorist threat. CBP looks forward to working with you to build on these successes.

CBP has made great strides toward securing America's borders, facilitating legitimate trade and travel, and ensuring the vitality of our economy. As America's front-line border agency, our priority mission is to protect the American public against terrorists and the instruments of terror while at the same time enforcing the laws of the United States and fostering the Nation's economic security through lawful travel and trade. Today, trained CBP Officers, technology, automation, electronic information, and partnerships with the trade and foreign governments are concepts that underpin CBP's cargo security and anti-terrorism initiatives. These concepts extend our zone of security outward and reinforce the components of our layered defense strategy.

As we work toward securing our ports and borders, we must also continue to perform our traditional missions, which include stemming the flow of illegal drugs and other contraband, protecting our agricultural and economic interests from harmful pests and diseases, protecting American businesses from theft of their intellectual property, regulating and facilitating international trade, collecting import duties, and enforcing United States trade laws. In FY 2006, CBP processed more than 422.8 million pedestrians and passengers, 131 million conveyances, 28.8 million trade entries, scanned and physically examined 5.6 million sea, rail, and truck containers, intercepted 1.1 million illegal aliens between our ports of entry intercepted more than 2.7 million prohibited plant and animal products, and seized more than 2.2 million pounds of narcotics.

**CBP OVERVIEW**

I am pleased to appear before the Subcommittee today to highlight key accomplishments related to container security in particular with regard to new and emerging technology. CBP has made tremendous progress in ensuring that supply chains bringing goods into the United States from around the world are more secure against potential exploitation by terrorist groups as a means to deliver weapons of mass effect. The use of cutting edge technology has greatly increased the ability of front line CBP Officers to successfully detect and interdict illicit importations of nuclear and radiological materials. CBP uses a multi-layered approach to ensure the integrity of the supply chain from the point of stuffing through arrival at a U.S. port of entry. This multi-layered approach includes:

- Advanced Information under the 24-Hour Rule and Trade Act of 2002

- Screening the information through the Automated Targeting System
- The Customs Trade Partnership Against Terrorism (C–TPAT)
- The Container Security Initiative (CSI)
- Use of Non-Intrusive Inspection Technology and Mandatory Exams for All High Risk Shipments

I will discuss each one of these layers in greater detail with particular focus on our radiation & nuclear detection capabilities.

**Advance Information**

CBP requires advanced electronic cargo information as mandated in the Trade Act of 2002 (including the 24-hour rule for maritime cargo). Advanced cargo information on all inbound shipments for all modes of transportation is effectively evaluated using the Automated Targeting System (ATS) before arrival in the United States.

ATS provides decision support functionality for CBP officers working in Advanced Targeting Units (ATUs) at our ports of entry and CSI foreign ports. The system provides uniform review of cargo shipments for identification of the highest threat shipments, and presents data in a comprehensive, flexible format to address specific intelligence threats and trends. ATS uses a rules-based program to highlight potential risk, patterns, and targets. Through rules, the ATS alerts the user to data that meets or exceeds certain predefined criteria. National targeting rule sets have been implemented in ATS to provide threshold targeting for national security risks for all modes: sea, truck, rail, and air.

Working with the Departmental Advisory Committee on Commercial Operations (COAC), CBP has proposed a new Security Filing in an effort to obtain additional advanced cargo information and enhance our ability to perform risk-based targeting prior to cargo being laden on a vessel overseas. The CBP proposal, better known as "10 plus 2" covers the following key areas:

1. Ten unique data elements from importers not currently provided to CBP 24 hours prior to foreign loading of cargo,
2. Two additional data elements provided by the carriers including the Vessel Stow Plan which is currently utilized by the vessel industry to load and discharge containers and Container Status Messaging which is currently utilized by the vessel industry to track the location of containers and provide status notifications to shippers, consignees and other related parties.

CBP is currently developing a Notice of Proposed Rulemaking (NPRM), which will be published in the Federal Register along with a request for comments. Obtaining additional information earlier in the process will increase the transparency of the global supply chain enabling the refinement of CBP's targeting processes and will provide additional information to make a more fully informed decision with respect to the risk of individual shipments.

**Customs Trade Partnership Against Terrorism (C–TPAT)**

C–TPAT is an integral part of the CBP multi-layered strategy, in that CBP works in partnership with the trade community to better secure goods moving through the international supply chain. C–TPAT has enabled CBP to leverage supply chain security throughout international locations where CBP has no regulatory reach. In 2007, CBP will continue to expand and strengthen the C–TPAT program and ensure that certified member companies are fulfilling their commitment to the program by securing their goods moving across the international supply chain to the United States. To carry-out this critical tenet of C–TPAT teams of Supply Chain Security Specialists (SCSS) will conduct validations and begin revalidations of C–TPAT members' supply chains to ensure security protocols are reliable, accurate, and effective.

As C–TPAT has evolved, we have steadily added to the rigor of the program. CBP has strengthened the C–TPAT program by clearly defining the minimum-security requirements for all categories of participants wishing to participate in the program and thereby gain trade facilitation benefits. As of March 2007, there are 6,628 companies certified into the C–TPAT program and 3,969 have been validated. CBP's goal is to validate all partners within one year of certification, revalidate all companies not less than once every three years and revalidate all U.S./Mexico highway carriers on an annual basis, based on the risk associated with the Southern Border Highway Carrier sector of C–TPAT. In addition, a Third Party Validation Pilot program will begin shortly.

**Container Security Initiative (CSI)**

To meet our priority mission of preventing terrorists and terrorist weapons from entering the United States, CBP has also partnered with other countries through our Container Security Initiative (CSI). Almost 32,000 seagoing containers arrive and are off loaded at United States seaports each day. In fiscal year 2006, that equated to 11.6 million cargo containers annually. Because of the sheer volume of sea container traffic and the opportunities it presents for terrorists, containerized shipping is uniquely vulnerable to terrorist exploitation. Under CSI, which is the first program of its kind, we are partnering with foreign governments to identify and inspect high-risk cargo containers at foreign ports before they are shipped to our seaports and pose a threat to the United States and to global trade.

The goal is for CBP's overseas CSI teams to conduct 100 percent manifest review before containers are loaded on vessels destined for the United States. However, in those locations where the tremendous volume of bills does not allow for the overseas CSI team to perform 100 percent review, CSI targeters at the National Targeting Center provide additional support to ensure that 100 percent review is accomplished. Utilizing the overseas CSI team and the CSI targeters at our National Targeting Center, CBP is able to achieve 100% manifest review for the CSI program.

Today, CSI is operational in 50 ports covering 82 percent of the maritime containerized cargo shipped to the United States. CBP is working towards strategically locating CSI in additional locations focusing on areas of the world where terrorists have a presence. CBP projects that by the end of 2007, CSI will be operational in 58 foreign seaports, covering over 85 percent of maritime commercial cargo destined for the United States.

**Non-Intrusive Inspection (NII) and Radiation Detection Technology**

The use of detection technologies represents the final piece of CBP's layered strategy. Technologies deployed to our nation's sea, air, and land border ports of entry include large-scale X-ray and gamma-imaging systems as well as a variety of portable and hand-held technologies to include radiation detection technology. NII technologies are viewed as force multipliers that enable us to scan or examine a larger portion of commercial traffic while facilitating the flow of legitimate trade, cargo, and passengers. CBP has deployed183 large-scale NII systems within our Nation's Ports of Entry. The future direction of the CBP's large-scale NII strategy will focus on acquiring and deploying high-energy imaging systems with enhanced performance features, including greater penetration capabilities.

The Office of Field Operations and the Laboratory & Scientific Services Division Interdiction & Technology Branch have identified high-energy systems that have demonstrated the appropriate performance characteristics (mobility, greater penetration capability, improved image quality) that will enhance CBP's ability to non-intrusively examine cargo and conveyances for weapons of mass effect and other contraband.

To clearly illustrate this path forward, in 2006, CBP acquired 15 new NII technology systems for deployment; 11 of the 15 systems are high-energy units.

As of March 14, 2007, 966 Radiation Portal Monitors (RPMs) have been deployed nationwide with the ultimate goal of scanning 100 percent of containerized cargo and conveyances for radioactive materials. CBP deployed the first Radiation Portal Monitor (RPM) on the U.S. side of the Ambassador Bridge, in Detroit on October 17, 2002. Current generation RPMs are constructed of Polyvinyl-toluene a form of plastic and are commonly referred to as PVT portals.

These RPMs permit CBP to scan for nuclear or radiological materials 100% of all arriving international mail and/or express courier parcels; 91% of all truck cargo and 81% of all personally owned vehicles arriving from Canada; 96% of all truck cargo and 91% of all personally owned vehicles arriving from Mexico; and 89% of all containerized sea-borne cargo. To date, we have scanned approximately 151 million conveyances with RPMs, and have resolved over 800,000 alarms. In addition, CBP has deployed over 800 Radiation Isotope Identifier Devices (RIID) and over 15,000 Personal Radiation Detectors (PRD). Currently, CBP scans 91% of all containerized cargo arriving in the U.S. by land and sea using RPMs.

These systems, although very sensitive, cannot distinguish between actual threats and radiation sources that are not security threats. Examples include medical isotopes and some naturally occurring radioactive materials. Hence the need for an improved detection system was identified.

The Domestic Nuclear Detection Office (DNDO) was chartered to develop and acquire new technologies that will improve the Nation's detection capabilities, in addition to procuring the current generation systems that are being deployed to our ports of entry. The Advanced Spectroscopic Portal (ASP) Program under the DNDO was implemented to address that challenge by providing a more robust radiological detection regimen. The ASP program is presently in the test and evaluation stage. Upon successful completion of the test and evaluation process, a recommendation to Secretary Chertoff will be made by DNDO to continue development of the ASP and procure the next-generation of passive radiation detection systems for deployment at the nation's borders. ASP systems will be developed for fixed and mobile applications in order to scan cargo entering the United States across land crossings, seaports, airports, and ultimately provide solutions for the challenges that we currently face at our shared trans-border rail crossings with Mexico and Canada.

These technologies, used in combination with our layered enforcement strategy, provide CBP with a significant capability to detect nuclear and radiological materials that may pose a security threat.

**Secure Freight Initiative (SFI)**

CBP continues to enhance and improve upon these layers. One such enhancement is the recent announcement of the Secure Freight Initiative. The Secure Freight Initiative is an unprecedented effort to build upon existing port security measures by enhancing the United States government's ability to scan containers for nuclear and radiological materials in seaports worldwide and to better assess the risk of inbound containers. On December 7, 2006, the Department of Homeland Security (DHS) and the Department of Energy (DOE), in cooperation with the maritime industry and foreign government partners, announced Phase One of the Secure Freight Initiative (SFI). The lessons learned and experience gained from Phase One of the Secure Freight Initiative represent critical steps in the process of determining whether the concept of 100% scanning is technologically and economically feasible and the degree to which it increases the security of the international supply chain. Phase One will provide lessons and evidence on how this new, integrated suite of radiation detection and radiography technology can meld smoothly into the logistics, operations, and flow of commerce at each different port.

The initial phase of the Secure Freight Initiative involves the deployment of a combination of existing technology and proven nuclear detection devices to six foreign ports: Port Qasim in Pakistan; Port Cortes in Honduras; Southampton in the United Kingdom; Port Salalah in Oman; Port of Singapore; and the Gamman Terminal at Port Busan in Korea.

Secure Freight will provide carriers of maritime containerized cargo with greater confidence in the security of the shipment they are transporting, and it will increase the likelihood for shippers and terminal operators that the flow of commerce will be both uninterrupted and secure.

This initiative is the culmination of our work with other Government agencies, foreign governments, the trade community, and vendors of leading edge technology. The scanning project is a first step toward realizing a greater vision of Secure Freight, a fully integrated global network for risk assessment.

**Role of Technology**

I would like to take just a moment to discuss the role of technology for supply chain security. Security technology is continuously evolving, not only in terms of capability but also in terms of compatibility, standardization, and integration with information systems. It is important to note that there is no single technology solution to improving supply chain security. As technology matures, it must be evaluated and adjustments to operational plans must be made. Priority should be given to effective security solutions that complement and improve the business processes already in place, and which build a foundation for 21st century global trade. A more secure supply chain also can be a more efficient supply chain.

As part of this, CBP in concert with the Science and Technology Directorate of DHS is in the process of generating technical and administrative requirements for Container Security Devices (CSD) based upon the operational needs of CBP and the trade community. These requirements should be published in mid-2007. It is important to note that the deployment of CSD technology only improves supply chain security as part of a broader supply chain security process that ensures the integrity of the shipment before the CSD is activated. Requiring such a device independent of a process to ensure that the container was secure before its application would have an adverse effect on security by creating the false impression that a dangerous shipment was secure.

With the components of our strategy firmly in place, and now enacted into law, we have a clear mandate to continue and evolve our programs. CBP, in concert with our sister agencies, is committed to implementing mandates outlined in the DHS Appropriations Act of 2007 and the SAFE Port Act of 2006. I am pleased to report that we are making great progress in meeting these requirements.

**CONCLUSION**

Mr. Chairman, Members of the Committee, today I have outlined CBP's commitment to investing its efforts in the areas of new and emerging detection technology along with some of the very positive steps we have taken towards enhancing cargo security. I believe CBP has demonstrated and will continue to demonstrate its leadership and commitment to protecting America against terrorists and the instruments of terror. As we move forward to face the many challenges ahead, we look forward to working in partnership with the 110th Congress to build on our many accomplishments and focus on getting the desired results. With the continued support of the President, DHS, and the Congress, CBP will succeed in meeting the challenges posed by the ongoing terrorist threat.

Thank you again for this opportunity to testify. I will be happy to answer any questions you may have.

Mr. LANGEVIN. Gentlemen, thank you for your testimony.

Before I begin my questions, I just wanted to mention that, as you, Mr. Ahern, brought up my trip out to L.A.–Long Beach, the Port of Los Angeles, it was a great visit, great site visit and gave me an opportunity to see up close and personal how the process works and how the equipment is working, and I was very impressed with what I saw out there.

I also had the opportunity to speak with people on the ground and ask them what the relationship was like between DNDO and CBP and how this is an important one, and the relationship got high marks, and it seems like it is working well.

So that brings me to my first question. Obviously, you feel strongly that for the nuclear detection mission to be successful, we have to pay attention to both the personnel and the equipment, and this, in turn, requires a great deal of cooperation between DNDO and CBP.

So if I could just ask, in terms of process, can you describe to the committee the process that was used to develop the deployment schedule for radiation portal monitors and was the strategy developed jointly with sign-off from both agencies.

Mr. OXFORD. Thank you, Mr. Chairman.

This has been a joint venture since DNDO was established to actually have a deployment and logistics team within my Systems Development Acquisition Office charged uniquely with the requirement to work with CBP to figure out the installation priorities and then go about the business of working against that priority list.

So they have been working feverishly over the last year to get this joint program plan in place, the joint development strategy, that not only talks about what sites we will go to, at what times, it also talks about the gradual integration of new technologies into that strategy so we know where ASP will go once it is certified by the secretary, into what secondary site.

And those are sites of choice by CBP. It is not something that DNDO specifies. It is where CBP says they would most like to enter them into preliminary, secondary screening and ultimately to gradually build up that strategy over time. So that is a joint document that Mr. Ahern and I have agreed to and is our strategy.

It is a dynamic document. As I mentioned, port reconfigurations take place. We have to go back and look at some of these and decide where to slide those into the priority list. It is dynamic, but it is a proactive strategy to get us there with the resources we have got available.

Mr. AHERN. If I just might add briefly to that. Certainly, I think we welcome DNDO once DHS was stood up and when they evolved as an organization for us to partner with on this issue. Because when we began this, it was before DHS was even created. So we very much welcome the partner that would actually be able to help us with some of the technological advice and help us with that aspect of our deployment.

What we bring to the process is knowledge of how our ports work, what we need for support of our frontline officers, the type of technological package we can inject in our operational environment, all the while being considerate that throughput and capacity is so delicate to cross-border travel and trade in the environment. So it is a great partnership, because we bring different skill sets, but we have the same goal as we go forward.

Mr. LANGEVIN. You are confident that, whether it is based on intelligence or concern that is raised by CBP, that if you needed to, you said that this was dynamic, that if you needed to change that deployment schedule quickly, that that could happen, that the intelligence would get to the right people at the right time and that we could get equipment in place as soon as possible?

Mr. OXFORD. Clearly, the plan is dynamic. Now, depending on whether we had started work at a site, it is not always immediate that we get installations in place. Now, we could react to a specific intelligence queue, maybe, with more mobile systems as opposed to some of the fixed installations, but the dynamics of the plan are that if CBP decided they needed to place emphasis somewhere, we would shift the priorities with the deployment people to do that, absolutely.

And I would also point out that I have been involved in a lot of programs in the Department of Defense and elsewhere that the developer wasn't always well-coupled with the user, and that usually does not lead to a good conclusion. So we are happy for all the help we get from CBP in terms of assigning the operational prerogatives and priorities to us. We think that is the way business ought to be done.

Mr. AHERN. And I would agree that, certainly, if we needed to be flexible and respond to an emerging challenge that we had not been aware of earlier in the process, we could quickly adapt to it.

When you are doing the physical laydown or permanent installations, it is a little more complex, takes a little more time, but that is the beauty of having—we now have 60 mobile RPMs out there, and we have seen some of those mounted on the back of the large trucks that can do operations. If we see it in some of the small ports or locations where we don't have the capacity, we can move that to there quickly. Also would be the compliment of some of the handheld devices that gives us the ability to get there very quickly to address an emerging threat.

When we first considered the laydown, we obviously went to the northern border first, and that was our first focus because of the potential threat coming from Canada and the United States and also the lack of advanced information.

Because I spoke of the multilayers that we have for our defense strategy at our nation's borders, it begins with getting electronic information in advance. We did not have that coming from Canada, whereas in a maritime environment, we were getting it 24 hours prior to lading, we were starting to put CSI teams overseas in foreign locations, giving us some capacity to do screening for security prior to lading. We didn't have that opportunity with Canada.

So based on volume and based on that level of threat and knowledge, we did our deployment on that northern border first, but now we are completing the border locations, both borders, 91 percent northern border, 96 percent southern border seaport.

I mentioned that statistic and we want to finish those off and then be able to address emerging threats and other environments that are also critical to the security of the country.

Mr. LANGEVIN. Very good. Very good.

Let me turn to costs for a second.

Director Oxford, I have a question related to one of the issues raised at last week's hearing regarding the cost-benefit analysis conducted by DNDO. The cost-benefit analysis overestimated the cost of the PVT monitors to be $131,000, which is 238 percent increase in what the actual cost is, which I understand is $55,000.

Is this still the expected cost? And if so, can you tell us why such a large cost increase is justified? Is there a concurrent increase of the performance of the RPMs? And given that DNDO has already purchased and deployed roughly 1,000 of these units and you plan to get 1,500, 2,000 more, shouldn't we be able to get a better price?

Mr. OXFORD. Mr. Chairman, I think one of the things I tried to correct last week was the $55,000 price quote was for a pedestrian portal, it is not a cargo portal. So an apples to apples between a deployed system for what we are dealing with in terms of cargo screening would be the $78,000 price that has been on the GSA schedule for some time. That contract has expired and is being renegotiated. We expect that price to be close.

Part of our $131,000 was to look at making some of those systems actually more capable and to see if we could get comparable both gamma capability as well as neutron capability. So it is about a two, to three, to one ratio between that and the ASP system.

When we did the CBA, one of the things we didn't talk about a lot last week was we looked at five different configurations for deployment strategies that ultimately took us away from what had been at one time an all–ASP deployment strategy where we would replace everything.

We came up with a hybrid approach where based on the volume of traffic at every port of entry or every site crossing, we will figure out the right combination of current PVT systems versus ASP, and in many cases, we will retain the PVT systems in primary screening with ASP as a secondary to work the discrimination and the operator workload. So we think we have been able to take what at one time was a $3.5 billion deployment plan down to about $1.4 billion across the entire strategy.

But we also have some issues associated with making sure that PVTs operate as well as they can. That is why we are testing them also at the Nevada test site until we fully understand their system's performance, so as we go forward with CBP, they understand how all of these systems work and what combinations fit best at every one of these ports.

Mr. LANGEVIN. Just for my understanding, the original $131,000 estimate was for what type of equipment? And you said the stationary model is the $76,000 per unit cost? And what is $55,000, what does that correspond to?

Mr. OXFORD. The $55,000 is for a pedestrian, if you just had people walking through, just like you would see at an airport. There is a design that is on the GSA schedule where you can buy those if you want to screen for people.

The cargo version, where you are actually looking at containerized cargo, was the $78,000 that I mentioned. What we had done is we looked at adding capability to that, if we wanted to deploy that, with better neutron capability. We were adding helium–3 tubes to that.

So the best comparison, if you really want to do apples to apples, would be the $78,000 to the $377,000 price as opposed to $55,000 to $377,000. We were trying to add additional capability to the PVT system when we went back and did the CBA. That probably confused some people.

Mr. LANGEVIN. Okay. Thank you for setting the record straight on that one.

Mr. Ahern, I have a question regarding the concept of operations used by your office to detect radiation, if you could just explain this a little further. The current procedure states that if a radiation alarm sounds in primary inspection, either by an RPM or by a radiation pager, the vehicle is sent to a secondary inspection where the vehicle is scanned with a radiation isotope identifier device, which usually a handheld device, as I understand.

These results are then evaluated by an officer who also has the option of contacting a technical expert with laboratory and scientific services. I know that between land and seaports, to date, roughly 360,000 alarms have been sounded and cleared, and I have been told, however that sometimes the RIID does not pick up the signal.

So what happens if that is the case? How can you resolve an alarm if the secondary device doesn't detect anything?

Mr. AHERN. Thank you for that question. I want to clarify a couple of points.

First off, the 360,000 alarms that have actually sounded, that number now has risen to close to 800,000. That is an older number. So we are now seeing over 150 million transactions that we put through the radiation portal monitors with about 800,000 that have been sent for further follow up because of an isotope that has actually alarmed the system.

Land border environments are basically the same as a seaport environment. They still will go from a primary portal, they will go through a secondary portal to go ahead and see if it alarms again. They will begin to try to locate it and isolate what the alarm is. They will use the handheld technology at that point in time to see if they can isolate it.

There is the capability then, once they identify the isotope, if they can identify it as being a nuisance alarm, we have the ability to go ahead and resolve it on site. We do have the reachback capability to our National Targeting Center where we can send the radiation spectra to the Laboratory and Scientific Service personnel so they can provide additional insight into what the isotope is that could be alarming in those particular circumstances.

Mr. LANGEVIN. Very good. Thank you for clarifying that.

Last question that I had for Director Oxford, I would like to focus a bit on closing many of the gaps that are still on the northern border. I know you touched on some of it, but it concerns me that some of the less populated areas, particularly along the northern border, still don't have adequate levels of radiation detection technology deployed.

Director, would you please describe where we are in terms of deploying our radiation detection equipment along the less populated areas of the northern border and outline some of the problems your department is facing there?

Would you also please give us your outlook as to when we will have full coverage of the more rural areas?

Mr. OXFORD. Mr. Chairman, I will let Mr. Ahern talk a little bit about the operating environment at some of those locations. As the director for field operations, he has a better feel on the ground for each of those. But in many cases, these are small and secure locations, but they take the same level of intensity for the installation that our larger-volume locations require.

That is why, based on the resources that are currently in our budget, it is going to take until 2013, and we will be dealing now with, in some cases, locations that have hundreds of percent of the overall cargo coming into this country.

So we are tracking places where there is 0.04 percent cargo coming across one location, but we are treating them with the same importance. It just takes a long time to go through these because of the numbers of locations now. We have hit all the high7-volume locations, and we are down to a lot of locations that require the same kind of intense installation process that we have been dealing with.

So it is a laborious process and is not an equipment issue as much as it is the arms and legs for people to get there, and that is where the resources are limited.

Mr. LANGEVIN. It is a function of resources in terms of dollars or is it a function of resources in terms of training personnel to operate the equipment?

Mr. OXFORD. It is actually the funding.

Mr. LANGEVIN. It is the funding.

Mr. OXFORD. Absolutely. We have looked at the supplemental, and, again, we are not overreacting to the prospects, but we are posturing in case the supplemental is successful. And right now, our estimate is we would take the 2013 deployment date and move it up to 2010 if that were to actually be made available.

Mr. LANGEVIN. Well, as you know, it has been my intention to try to push that issue as aggressively as possible, as you would agree, and try to get this program fully funded and deployed as quickly as possible. And we will continue to work together on that goal.

Mr. OXFORD. We appreciate your support. Again, what we are doing right now is we are looking at some contracts that we would award very quickly to get the extra deployment capacity, and then the equipment would be based, again, on ASP certification with the secretary. We would have to, at that time, decide whether to go with current generation systems or next generation systems based on his certification, hopefully in June, but we would be able to move out and, again, slide the deployment date from 2013 to 2010.

Mr. LANGEVIN. Thank you. Thank you for that.

I have concluded my questions, and I would like to welcome a new member, Mr. McCarthy, to the committee and ask if the gentleman from California would like to inquire.

Mr. MCCARTHY. No.

I just want to thank you, Mr. Chairman, for letting me be part of the committee. I know I am a little late, I apologize, and I will just pay attention a little more.

Mr. LANGEVIN. That is all right. You are the first one on the minority side to show up, so this is a good thing. We are glad you are here.

Well, that concludes my questions. I am sure Mr. McCaul will have both a statement and some questions to submit for the record.

With no further business, I will just end by thanking our two witnesses for their valuable testimony.

The members of the subcommittee may have additional questions, and we will forward that to you. All members will have an opportunity to inquire further.

But I want to thank you both for your testimony and for your service to the country. It is a difficult job, I know. The consequences of failure are catastrophic, which we cannot allow to happen, and you are working aggressively to do all you can to protect the country and our citizens, and we are grateful for your service.

Thank you.

And this committee stands adjourned.

[Whereupon, at 3:40 p.m., the subcommittee was adjourned.]

# APPENDIX

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ADDITIONAL QUESTIONS AND RESPONSES

RESPONSES SUBMITTED BY GENE ALIOSE

QUESTIONS FROM THE HONORABLE JAMES R. LANGEVIN, CHAIRMAN

**Question 1.: Do you agree that highly enriched uranium (HEU) is one of the most challenging threats to detect?**

**GAO Response:** Yes, HEU is one of the most challenging threats to detect, primarily because it emits a lower level of radioactivity than other radioactive sources. Detection can be made even more difficult if the HEU is shielded within a high-density material, such as lead.

**Question 2.: If an advanced spectroscopic portal (ASP) system can accurately identify HEU, does this mean that the ASP system will also perform equally well in identifying a different radioactive material that emits stronger radioactive signals.**

**GAO Response:** Even if an ASP system can identify HEU, it will not necessarily perform equally well in identifying other radioactive materials, even if they emit stronger radioactive signals than HEU. Different radioactive materials emit gamma rays with unique energies that creates a radiological signature that is unique to that specific material. ASP systems contain software designed to identify material such as HEU by recognizing the material's unique radiological signature. Thus, an ASP can identify a material only if its radiological signature is programmed into the ASP's software. For example, if an ASP's software has not been programmed to include the unique radiological signature of cesium, a common radiological material, then the ASP will not be able to correctly identify cesium.

QUESTION FROM THE HONORABLE AL GREEN

**Question 3:** In GAO's view, to what degree did the cost-benefit analysis of advanced spectroscopic portals conducted by the Domestic Nuclear Detection Office (DNDO) meet DHS's guidelines on how to perform a cost-benefit analysis?

**GAO Response:** DNDO's cost-benefit analysis of ASPs fully met only one of eight major criteria we identified within DHS' guidelines on how to conduct a cost-benefit analysis and is, therefore, incomplete. In our view, DNDO partially met three of the additional criteria and did not meet the other four criteria at all. During the March 14, 2007 testimony, the Director of DNDO asserted that DNDO was not aware of any specifics concerning the degree to which the methodology DNDO used in its cost-benefit analysis met DHS' guidelines for conducting cost benefit analyses. This is not the case. On June 27, 2006, we briefed DNDO officials, including the Assistant Director, Systems Development and Acquisition Directorate, and officials from Customs and Border Protection (CBP), on the information provided in Table 1, which summarizes the results of our analysis.

Table 1: The Extent to Which DNDO's Cost-Benefit Analysis Met Criteria Established in DHS Guidelines



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| Criterion | Extent to which DNDO's Cost-Benefit Analysis Met DHS Criteria |
| --- | --- |
| 1. The analysis should clearly state why the Department believes a project or investment is necessary. | Fully met. |
| 2. The analysis should include at least two alternatives to the current system. | Partially met. |
| 3. The analysis should include the rationale for including each alternative, including the specific pros and cons for each. | Partially met. |
| 4. The analysis' cost estimate for each alternative should be reasonable and complete. | Not met. |
| 5. The analysis' benefit estimates for each alternative should be reasonable. | Not met. |
| 6. The analysis should apply a proper discount rate to the costs and benefits and compare and evaluate alternatives on the basis of their net present value. | Not met. |
| 7. The analysis should include an assessment of the uncertainty of each alternative's costs and benefits. | Partially met.. |
| 8. The analysis should be compared with similar analyses and any differences should be discussed and explained. | Not met.. |

*Criterion 1: The analysis should clearly state why the Department believes a project or investment is necessary.* (**Fully Met**)

DNDO clearly articulated in its cost-benefit analysis that it believes the polyvinyl toluene—or "plastic scintillator" portal monitors (PVT)—currently deployed at the nation's ports-of-entry are inadequate and should be replaced with new technology. DNDO asserts that because PVTs detect the presence of radiation but do not identify its specific radiological isotope, they produce an unacceptable number of alarms. This occurs because PVTs alarm when the radioactive material detected inside a container is a benign material such as roofing tiles or fertilizer, as well as when it is a potentially dangerous material such as cesium or special nuclear materials (SNM). DNDO also clearly states that it believes secondary inspections—the inspections CBP performs after the material in a container triggers an alarm—slow the flow of commerce at seaports to an unacceptable degree. By explaining what it believes to be the problem with the current system of radiation detection at U.S. ports-of-entry, DNDO has **fully met** its requirement for this criterion.

However, it is important to note that, although DNDO fully explained what it asserts to be the problem with the current system of radiation detection (i.e., the use of PVTs slows the flow of commerce), it did not conduct an evaluation to determine the extent to which DNDO's alternative (the use of ASPs) will help to prevent nuclear smuggling—the primary purpose of radiation detection equipment. The only benefit from ASPs that DNDO cites in its analysis is improving the flow of commerce.

*Criterion 2: The analysis included at least two alternatives to the current system.T1* (**Partially Met**)

- DNDO included four alternatives to the current system of using PVTs in its cost-benefit analysis. These alternatives included an all-PVT option, two combination PVT–ASP options, as well as an all-ASP option. However, in our view, DNDO's analysis of each alternative was incomplete. Critical problems in DNDO's analysis include the following:
- DNDO based cost projections on 5 years because the contract was for that length of time rather than using a more reasonable life cycle of 10-years for an ASP or PVT.
- DNDO omitted system development costs in the total costs of ASPs.
- DNDO omitted costs that will be necessary to heat and cool ASPs. (Unlike PVTs, ASPs require heating and cooling systems to protect their hardware from extreme temperatures.) According to officials at CBP, depending on where an ASP is located, these heating and cooling costs could be substantial.

- DNDO omitted costs related to the specific ports in which an ASP may be deployed. These costs may vary significantly from port to port and are not necessarily the same for both ASPs and PVTs.
- Although ASPs differ in their ability to detect and identify radiological and nuclear materials, DNDO did not develop individual cost estimates for several ASPs; instead, it developed an estimate for only one. ASPs use crystals to detect and identify radiological materials, and the number and type of crystals they contain determines their detection and identification abilities. ASPs with better detection and identification abilities can cost several times more than those that are less sensitive. In contrast, the independent government cost estimate (IGCE) that DNDO obtained to support its cost-benefit analysis included separate cost estimates for three ASPs that differed in their ability to identify radiological and nuclear sources. In our view, DNDO should have developed cost estimates for ASPs of differing abilities in order to create a more comprehensive assessment.

*Criterion 3: The analysis should include the rationale for including each alternative, including the specific pros and cons for each.* (**Partially Met**)

DNDO included a general rationale for each alternative. However, it did not include specific pros and cons for each alternative, nor did it explicitly explain the factors it believed were important to analyze for each alternative. As a result, DNDO's rationale for favoring one alternative over another is not immediately transparent. For instance, DNDO's preferred option is to continue the use of PVTs for primary inspections (the initial screening of cargo as it departs ports of entry) and to use ASPs for secondary inspections (follow-up screenings for cargo that alarms during the primary screening). In the analysis, DNDO asserted that this alternative provides better performance and largest net benefits among the four alternatives. However, DNDO never explained what it meant by "better performance" relative to the other alternatives. DNDO also did not identify the potential disadvantages of using ASPs for secondary inspections, such as the possibility that an ASP could mistake a dangerous radiological material for something more benign—or detect nothing at all. In either case, dangerous nuclear or radiological material might be smuggled into the country.

*Criterion 4: The analysis' cost estimate for each alternative should be reasonable and complete. (***Not Met**)

DHS's guidance states that a reasonable estimate should develop the baseline costs associated with the current situation (i.e., using PVTs to screen cargo). This baseline should then be used to assess the costs for each of the alternatives. However, DNDO did not examine the costs of the current situation, rejecting it as "unacceptable" because of the number of false alarms that DNDO contends PVTs currently generate at U.S. points-of-entry. DNDO made this assertion without providing any supporting quantitative analysis. As a result, DNDO's analysis presented no way to compare each alternative to the current situation of using PVTs.

DNDO's cost estimates were also incomplete, omitting important items such as development costs, installation costs, operation costs that would be paid by CBP or seaport operators, and the costs associated with an ASP's "false negatives"—instances in which the ASP incorrectly identifies a radiological or nuclear material as benign. DNDO contends that estimating the potential cost of a false negative is impossible because of the difficulty in estimating (1) the probability that a dirty bomb or nuclear bomb could be detonated in the United States and (2) the economic damage resulting from a dirty bomb or nuclear bomb. However, it is important to note that economists, statisticians, and scientists make these types of estimates in a variety of areas, such as estimating the value of risks associated with nuclear power plants.

*Criterion 5: The analysis' benefit estimate for each alternative should be reasonable. (***Not Met**)

DHS's guidance requires that analysts measure and quantify the value of benefits in their cost-benefit analyses. The guidance suggests that all benefits can be quantified and urges analysts to monetize benefits to the greatest extent possible. DNDO's analysis did not produce reasonable estimates of benefits because the only benefits it describes are those associated with speeding up the flow of commerce out of seaports by reducing the number of false alarms and secondary inspections. The primary reason for installing radiation portal monitors is to prevent the smuggling of radiological or nuclear materials. DNDO never considers this in its benefit analysis. Instead, DNDO relies on a reduction of the time CBP takes to complete a secondary inspection as the sole benefit of ASPs.

*Criterion 6: The analysis should apply a proper discount rate to the costs and benefits and compare and evaluate alternatives on the basis of their net present value.* (**Not Met**)

DHS's guidance requires that the Department's cost-benefit analyses apply a discount rate that would convert future costs and benefits into present-day dollars. OMB Circular A–94, the general guidance for conducting cost-benefit analyses of federal government programs, also requires that analyses apply discount rates to all future costs and benefits.[1] DHS' guidance further requires that an analysis' discount rates should be in real terms (i.e., reflecting inflation, which reduces the value of the dollar over time), and applied over the same number of years for the current situation and each alternative. DHS's guidance also requires that benefits should be stated in terms of net present value, which attempts to adjust future costs and benefits in terms of the value of today's dollar.

DNDO did not apply a discount rate to any of the costs or benefits in its analysis. Given that DNDO will accrue costs today for development and installation of ASPs, while the benefits for the ASPs remain uncertain and in the future, the application of a discount rate could significantly affect the results of DNDO's analysis, especially if it included the option of maintaining the status quo. The development costs and installation costs of PVTs, because they represent a relatively mature technology, are relatively small compared to those of ASPs. Similarly, DNDO never calculated its benefits in terms of net present value. This could be a critical omission if the benefits of ASPs are delayed because they do not perform immediately as expected. Benefits accrued today would have a higher value than benefits accrued in the future.

*Criterion 7: The analysis should include an assessment of the uncertainty of each alternative's costs and benefits.* (*Partially Met*)

Cost-benefit analyses inherently have a degree of uncertainty because they use data and measurements that may be imprecise and apply assumptions about the future that may not come to fruition. DHS' guidance requires that a cost-benefit analysis acknowledge and account for these uncertainties and discuss how the uncertainties affect the relative value of each alternative. An uncertainty analysis should include an assessment of how much particular assumptions must change in order for the net benefits of the second best alternative to match the net benefits of the preferred alternative. In particular, DHS suggests that a cost-benefit analysis include "sensitivity analyses" that change a single assumption or factor in the analysis in order to assess how it changes the final outcome of the analysis. For example, a sensitivity analysis could calculate whether the purchase of ASPs would still produce a net benefit if their purchase price proved to be twice what DNDO assumes. A sensitivity analysis provides the reader with an idea of how precise and how stable the final outcome of the analysis may be.

DNDO did not include an assessment of the overall uncertainty of the estimates contained within its analysis. It did, however, include a sensitivity analysis of how changes in a few factors would affect DNDO's overall analysis. For instance, DNDO changed its assumptions about the ASP's maintenance costs, raising it from 10 percent to 25 percent of the purchase price, and showing that this change did not affect DNDO?s choice of a preferred alternative.

Nonetheless, DNDO's sensitivity analysis did not go far enough. If, for example, maintenance for an ASP costs 55 percent of its purchase price—an assumption we believe is plausible depending on the environmental conditions in which an ASP is installed—DNDO's proposed alternative no longer has the largest net benefits. Similarly, if DNDO included all the costs associated with ASPs that we believe it omitted from its analysis, such as costs of purchasing heating and cooling units and their associated electricity costs, DNDO's proposed alternative may not return the largest net benefits.

*Criterion 8: The analysis should be compared with similar analyses and any differences should be discussed and explained.* (*Not Met*)

DHS' guidance states that cost-benefit analyses, to the extent possible, should cross-reference similar analyses on the issue or analyses using similar methodologies. In this case, DNDO should have examined other cost estimates of ASPs and PVTs or the methodology of other studies examining the costs and benefits of technologies that have yet to be fully developed.

However, DNDO did not mention in its cost-benefit analysis whether it consulted other estimates of the costs of ASPs and PVTs or the methodologies of other studies. Neither did DNDO state that it conferred with other federal entities that use radi-

[1] Appendix C of OMB Circular A–94 provides specific guidance on the discount rates to be used. Circular A–94 can be found at *www.whitehouse.gov/omb/circulars/a094/a094.html.*

ation detection equipment, such as the Department of Defense or the Department of Energy, on the reasonability of its cost estimates or the assumptions in its analysis. DOE's experience developing and using portal monitors as it screens cargo in selected foreign ports before it embarks for the United States (the Megaports program) should have been assessed. Finally, CBP's experience with its installation of PVTs also could have been helpful in this regard. In short, DNDO did not conduct a "reality check" with other entities that have experience with the procurement, installation, and operation of radiation detection equipment.

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