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PREVENTING NUCLEAR TERRORISM: DOES DHS HAVE AN EFFECTIVE AND EFFICIENT NUCLEAR DETECTION STRATEGY?

HEARING

BEFORE THE

SUBCOMMITTEE ON CYBERSECURITY, INFRASTRUCTURE PROTECTION, AND SECURITY TECHNOLOGIES

OF THE

COMMITTEE ON HOMELAND SECURITY HOUSE OF REPRESENTATIVES

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PREVENTING NUCLEAR TERRORISM: DOES DHS HAVE AN EFFECTIVE AND EFFICIENT NUCLEAR DETECTION STRATEGY?

Thursday, July 26, 2012

U.S. HOUSE OF REPRESENTATIVES,
COMMITTEE ON HOMELAND SECURITY,
SUBCOMMITTEE ON CYBERSECURITY, INFRASTRUCTURE
PROTECTION, AND SECURITY TECHNOLOGIES,
Washington, DC.

The subcommittee met, pursuant to call, at 9:59 a.m., in Room 311, Cannon House Office Building, Hon. Daniel E. Lungren [Chairman of the subcommittee] presiding.

Present: Representatives Lungren, Walberg, Marino, and Clarke.

Mr. LUNGREN. The Committee on Homeland Security, Subcommittee on Cybersecurity, Infrastructure Protection, and Security Technologies will come to order.

The subcommittee is meeting today to examine the nuclear detection capabilities and strategy of the Department of Homeland Security. We have been advised that we are going to have votes starting at 10:30 or 10:45. It will go for 2 hours, so we are going to try and—we are going to have to get this in, in a very short period of time. So we will move as quickly as possible and hopefully get to questions.

I will recognize myself for an abbreviated opening statement.

First of all, let me thank those of you who are here and others who helped give us a very, very good classified briefing the other day. I think that was very helpful. I understand there were a lot of questions and answers that we got in the classified briefing that we couldn't have here, and I appreciate it. Just for the record, I think the attendance of the membership was an indication of how important this issue is and how well received the briefing was.

Nuclear and radiological terrorism is my greatest fear for various reasons, which I articulate in my written statement, which will be made a part of the record. I would mention that it was a year ago in this hearing room that the Domestic Nuclear Detection Office informed us that it was canceling the costly Advanced Spectroscopic Portal Monitoring Program, known as ASP. Obviously that was a disappointment. The disappointment was expressed by the Department. It was shared, at least shared, by those of us on this subcommittee.

A few months ago the Department provided its proposed path forward with the Global Nuclear Detection Architecture—GNDA—implementation plan. We thank you for responding to our questions on that in the classified briefing that we had. I believe that this is a major accomplishment of your office by facilitating the interagency cooperation that is essential to the development of such a comprehensive architecture.

In 2005 the President called for the establishment of the Domestic Nuclear Detection Office, DNDO, in the Department of Homeland Security. I responded by codifying it in our Safe Port Act of 2006, which we introduced to address the terrorist threats at our ports of entry. I believe the Safe Ports Act has served the Nation very well. The Department acknowledged at least the Department has met its goal of scanning 100 percent of the containerized cargo entering our country's highest-risk ports.

Now that we have made progress in securing these ports it is important to expand our look into all potential pathways for nuclear smuggling whether by land, sea, or air. The Global Nuclear Detection Architecture is a response to that. We appreciate the work that you are doing on that.

Unfortunately for the subcommittee, we have seen a recurring theme—and perhaps you can address that—that DHS is struggling to manage its technology acquisition processes. We hope that the situation will be quickly corrected, since it is a vital part of our global architecture strategy.

I would like to commend DNDO on its Securing the Cities Program, which has successfully put radiation detector technology in the hands of first responders throughout the New York City area. It is, I believe, a model for Federal-State nuclear defense cooperation.

I would leave the rest of my statement to be entered into the record so that we can proceed as quickly as possible to our panel.

[The statement of Chairman Lungren follows:]

STATEMENT OF CHAIRMAN DANIEL E. LUNGREN

JULY 26, 2012

Nuclear and radiological terrorism is my greatest fear. It would represent an unprecedented catastrophic event, causing enormous death, destruction, as well as long-term economic disruption. So it is critical that we continue our vigilance and oversight efforts in order to address this continuing threat. Our subcommittee hearing today will examine the current nuclear detection strategy of the Department of Homeland Security and assess whether that strategy is both effective and efficient in countering this threat.

It was exactly 1 year ago today, in this very hearing room, that the Domestic Nuclear Detection Office informed me that it was cancelling its costly Advanced Spectroscopic Portal Monitoring Program, known as "A–S–P". After much promise, testing, and evaluation, the Department cancelled ASP without identifying a new technology replacement.

Three months ago, the Department provided its proposed path forward with its Global Nuclear Detection Architecture (GNDA) "Implementation Plan". This was a major accomplishment of DNDO by facilitating the interagency cooperation that is essential to the development of such a comprehensive architecture. The plan provides for the first time, a 5-year look-ahead of the needed capabilities for countering our nuclear and radiological threats. While the GNDA plan contains excellent procedures and policies to coordinate our Nation's nuclear defense efforts, it fails to identify the Department's priorities for acquiring its next generation of detection equipment.

In 2005, the President called for the establishment of the Domestic Nuclear Detection Office (DNDO) in the Department of Homeland Security. I responded by codifying DNDO in the SAFE Port Act of 2006 which I introduced to address terrorist threats at our ports of entry. I believe that the SAFE Port Act has served this Nation very well. We are proud to acknowledge that the Department has met its goal of scanning 100% of containerized cargo entering our country's highest-risk ports. Now that we have made progress in securing these ports, it is important that we expand our look into all potential pathways for nuclear smuggling, whether by land, sea, or air. In response, DNDO is developing, in coordination with the Departments of Defense, Energy, and State, the Global Nuclear Detection Architecture. DNDO is responsible for implementing the domestic portion of this architecture which focuses on the U.S. border as well as Federal, State, and local governments. It's also responsible for developing and acquiring radiation detection equipment to support the domestic efforts of DHS and other Federal agencies. A key partner in this domestic nuclear security effort is U.S. Customs and Border Protection, or "C–B–P". We are disappointed that CBP was unable to testify at today's hearing but we look forward to hearing from them on this topic at a later date.

Today we will examine how the Global Nuclear Detection Architecture will detect and prevent a catastrophic nuclear terrorism event. Reliable and effective detection technology is critical to that effort. Unfortunately, in hearings before this subcommittee, we have seen a recurring theme: DHS struggling to manage its technology acquisition processes. We are hopeful that this situation will be quickly corrected since it is a vital part of our global architecture strategy.

I would like to compliment DNDO on its Securing the Cities Program which has successfully put radiation detector technology in the hands of first responders throughout the New York City metropolitan area. Securing the Cities is a model for Federal-State nuclear defense cooperation. We are hopeful that DNDO can apply these positive lessons learned to its next generation of radiation portal monitors (RPM's) and other technologies.

Dr. Gowadi, I welcome and congratulate you on your new Director position. It is a critical role and the centerpiece of our defense to the Nation's nuclear terrorist threat.

I also look forward to hearing from GAO on the effectiveness and efficiency of DNDO's plans as well as one of our National laboratories on new and innovative ways to improve our radiation detection capability.

I now recognize the gentle lady from New York, Ms. Clarke for her opening statement.

Mr. LUNGREN. I would now recognize my Ranking Member, the gentle lady from New York, Ms. Clarke, for her opening statement.

Ms. CLARK. I thank you, Mr. Chairman. Thank you for holding this hearing today to discuss developments in the Domestic Nuclear Detection Office strategy and the Global Nuclear Detection Architecture.

It has been said before, the enormous devastation that would result if terrorists used a nuclear weapon or nuclear material successfully requires us to do all we can do to prevent them from entering or moving through the United States. This subcommittee in its oversight capacity has held hearings starting in 2005 and continuing through 2012 regarding the development and implementation of the GNDA and in the decision-making process that involves costly investments in it.

The overarching issues include the balance between investment in near-term and long-term solutions for architecture gaps, the degree and efficiency of Federal agency coordination, the mechanism for studying agency investment priorities in the architecture, and efforts DNDO has undertaken to retain institutional knowledge regarding this sustained effort.

In the policy and strategy documents of the GNDA the DNDO is responsible for developing the global strategy for nuclear detection, and each Federal agency that has a role in combating nuclear smuggling is responsible for implementing its own program. DNDO identified 73 Federal programs, which are primarily funded by DOD, DOE, and DHS that engage in radiological and nuclear detection activities.

With the publication of an overall DNDO strategy development document and the release of the Global Nuclear Detection Architecture and the implementation plan, Congress will have a better idea of how to judge DNDO's policy, strategy, operations, tactics, and implementation.

But we need to know about their R&D activities, their resource requests and their asset allegations. I know that I might sound like a broken record before the day is through, but from the very start of the ASP program, which was officially cancelled just 10 days ago, July 16. DNDO seemed to push acquisition decisions well before the technology had demonstrated that it could live up to its promise.

On July 14, 2006, Secretary of Homeland Security Michael Chertoff, and then-director of DNDO, Mr. Oxford, one of our witnesses today, announced contract awards to three companies worth an estimated $1.2 billion to develop ASP, including the Raytheon Company from Massachusetts, the Thermal Electron Company from Santa Fe, New Mexico, and Canberra Industries from Connecticut.

Both Secretary Chertoff and Oxford held a press conference to announce the billion-dollar contract awards just a few months after highly critical reviews of the ASP's ability by the GAO and the National Institute of Standards and Technology. I hope we don't see that kind of decision making again in DNDO.

Within DNDO, policy and strategy have historically not been adequately translated into operations, tactics, and implementation. Overlapping missions, especially in the field of nuclear detection, worsened this. Since 2009, DNDO has made important changes under Secretary Napolitano, and made especially good progress in nuclear forensics. I hope that our Congressional oversight has had an effect, a positive one, in bringing to light decisions that cost the taxpayers a lot of money with little to show.

In 2010, the Science and Technology Directorate requested $109 million for the transformational research and development, radiological and nuclear division. This research was to be transferred from DNDO to the Science and Technology Directorate, and the Democratic committee Members supported the transition of radiological and nuclear research away from DNDO into S&T.

The committee, under then-Chairman Thompson, worked to make this transition happen and we believed that research and development and operations and procurement are best left to separate organizations in order to avoid obvious conflicts of interest.

What I hope we are going to hear today is how DNDO's mission can be better defined. Some claim there is still confusion as to whether it is an end-to-end RDT&E and procurement entity for all things nuclear and radiological, a development entity or an operational entity, and the question whether there is an inherent conflict of interest when an agency is both an R&D workshop and a procurement platform.

Let me finish with this thought, completely out of the policy arena. On the ground and every day our nuclear deterrent effort requires motivated and vigilant officers supplied with the best equipment and intelligence we can give them.

Customs and Border Patrol officers working at our Nation's ports of entry have an extremely complex and difficult job. Thousands of decisions are made every day to clear a container or personal vehicle for transit into the United States, require further inspection, and even deny entry or interdict such a vehicle or person. That is the hard, cold, every-day reality of our mission to prevent this kind of violent nuclear attack. We must do our best.

I look forward to hearing from our witnesses today.

With that, Mr. Chairman, I yield back.

[The statement of Ranking Member Clarke follows:]

STATEMENT OF RANKING MEMBER YVETTE D. CLARKE

JULY 26, 2012

Mr. Chairman, thank you for holding this hearing to discuss developments in the Domestic Nuclear Detection Office Strategy, and the Global Nuclear Detection Architecture.

It has been said before, the enormous devastation that would result if terrorists use a nuclear weapon or nuclear materials successfully, requires us to do all we can to prevent them from entering or moving through the United States.

This subcommittee, in its oversight capacity, has held hearings starting in 2005, and continuing through 2012, regarding the development and implementation of the GNDA and in the decision-making process that involves costly investments in it.

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With the publication of an overall DNDO strategy document and the release of the Global Nuclear Detection Architecture and implementation plan, Congress will have a better idea of how to judge the DNDO's policy, strategy operations, tactics and implementation.

But we need to know more about their R&D activities, their resource requests, and their asset allocations. And I know that I might sound like a broken record before the day is through, but from the very start of the ASP program which was officially cancelled just 10 days ago, July 16, DNDO seemed to push for acquisition decisions well before the technology had demonstrated that it could live up to its promise.

On July 14, 2006, Secretary of Homeland Security Michael Chertoff and the then-Director of DNDO, Mr. Oxford, one of our witnesses today, announced contract awards to three companies worth an estimated $1.2 billion to develop ASPs, including the Raytheon Company, from Massachusetts, the Thermo Electron Company from Santa Fe, New Mexico and Canberra Industries from Connecticut. Both Secretary Chertoff and Oxford held a press conference to announce the billion-dollar contract awards just a few months after highly critical reviews of the ASPs' abilities by the GAO and the National Institute of Standards and Technology (NIST).

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Within DNDO, policy and strategy have, historically, not been adequately translated into operations, tactics, and implementation. Overlapping missions, especially in the field of nuclear detection, worsen this.

Since 2009, DNDO has made important changes under Secretary Napolitano, and made especially good progress in nuclear forensics. And I hope that our Congressional oversight has had an effect, a positive one, in bringing to light decisions that cost the taxpayers a lot of money, with little to show.

In 2010, the Science and Technology (S&T) Directorate requested $109.000 million for the Transformational Research and Development Radiological and Nuclear Division. This research was to be transferred from DNDO to the S&T Directorate,[1] and the Democratic Committee Members supported the transition of radiological and nuclear research away from DNDO into S&T. The committee, under then-Chairman Thompson, worked to make this transition happen, and we believe that research and development, and operations and procurement, are best left to separate organizations in order to avoid the obvious conflict of interest.

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Let me finish with this thought, completely out of the policy arena. On the ground, and every day, our nuclear deterrence effort requires motivated and vigilant officers supplied with the best equipment and intelligence we can give them. Customs and Border Patrol officers working at our Nation's ports of entry have an extremely complex and difficult job.

Thousands of decisions are made every day to clear a container or personal vehicle for transit into the United States, require further inspection, or even deny entry or interdict such a vehicle or person, and that is the hard, cold, everyday reality of our mission to prevent this kind of violent nuclear attack.

We must do our best.

I look forward to hearing from our witnesses today and with that, Mr. Chairman, I yield back.

Mr. LUNGREN. The gentle lady yields back.

Other Members of the committee are reminded that opening statements may be submitted for the record.

[The statement of Ranking Member Thompson follows:]

STATEMENT OF RANKING MEMBER BENNIE G. THOMPSON

JULY 26, 2012

Good morning, Mr. Chairman, and thank you for holding this hearing. I also want to thank the witnesses for their testimony today.

Exactly 1 year ago, we had a similar hearing on our nuclear detection capabilities.

As we continue to seek ways to resolve known vulnerabilities, the work of DNDO can play an important role in the security of our borders and ports of entry by assuring that radiological and nuclear materials are detected before they enter this country.

Many DHS components contribute to meeting the Department's strategic goal of preventing unauthorized acquisition or use of chemical, biological, radiological, and nuclear materials and capabilities, but only DNDO has detection as a core mission.

Since its creation, the Department has maintained existing programs, and established new programs dedicated to the detection of radiological and nuclear materials.

These programs initially lacked a unified strategy that integrated their activities with the programs of other Federal departments.

In 2010, the Department, in coordination with other Federal agencies, released a strategic plan for the global nuclear detection architecture that provided this unified strategy.

It is my understanding that the strategy does not provide guidance to participating entities; leaves program level budgeting to the discretion of the component, and does not establish performance measures and benchmarks.

It seems that without these elements, the strategy is not a road map to success and may well be a path to nowhere.

I raise the need for these elements because I do not want DNDO to repeat the ASP fiasco. After several years, a few GAO reports, and $393 million,[1] DNDO has come to the conclusion that ASP is not a workable product.

And while I commend you for accepting the truth, it is my understanding that this conclusion could have been reached much sooner and without the expenditure

[1] DHS fiscal year 2011 Budget in Brief, *ICE 10–2647.000474 p. 139.*

[1] Government Accountability Office, *Combating Nuclear Smuggling: DHS Has Developed a Strategic Plan for its Global Nuclear Detection Architecture, but Gaps Remain,* GAO–11–869T, July 26, 2011.

of millions of dollars if DNDO had talked to CBP and understood the needs of the product's end-user.

I hope that the Global Nuclear Detection Architecture and strategy is an effort to revamp the process that allowed the ASP fiasco to occur.

However, I cannot be assured that DNDO has learned from this experience without knowing that routine management tools like performance measures and benchmarks are in place.

Hopefully, our witnesses today will tell us that DNDO has turned a corner and is not likely to repeat its unfortunate past.

Mr. LUNGREN. We are pleased to have a distinguished panel of witnesses today for us on this important topic. Dr. Huban Gowadia is the acting director of the Domestic Nuclear Detection Office at the Department of Homeland Security. In this capacity, she oversees integration of the interagency efforts for technical nuclear detection and forensics, and directs research, development, evaluation, acquisition activities for the Department's radiological and nuclear detection technologies.

Served most recently at DNDO as the deputy director. Previously served as the assistant director of DNDO's mission management directorate, where she was responsible for ensuring an effective link between user requirements, operational support, and technology development across the nuclear detection architecture.

Mr. David Maurer is the director in the U.S. Government Accountability Offices, Homeland Security and Justice team, where he heads GAO's work reviewing DHS and DOJ management issues. His recent work in these areas include DHS management integration, the Quadrennial Homeland Security review, Secret Service financial management, DOJ grant management for the present system, and assessment of the technology for detecting explosives in the passenger rail environment.

Mr. Vayl Oxford is the national security policy advisor at the Pacific Northwest National Laboratory. In this role he is responsible for working with the laboratory's leadership to guide the strategic direction and vision for National security issues.

Prior to joining the Pacific Northwest National Laboratory, Mr. Oxford spent a short time in private industry after 35 years of public service, combining time in the military and as a government civilian employee. He served at the Department of Homeland Security from October 2003 to January 2009, where he held positions of policy advisor to the under secretary of science and technology, acting director of Homeland Security Advanced Research Projects Agency, and as the first director of the Domestic Nuclear Detection Office.

I am sorry we are under the time constraints that we have, but we are going to have a voting session of about 2 hours on the floor. So again, your written statements will be made a part of the record and we would ask you for a summarization of 5 minutes of each of your points and then we will try and get as many questions possible.

If you will please testify in the order in which I introduced you.

STATEMENT OF HUBAN A. GOWADIA, ACTING DIRECTOR, DOMESTIC NUCLEAR DETECTION OFFICE, DEPARTMENT OF HOMELAND SECURITY

Ms. GOWADIA. Good morning, Chairman Lungren, Ranking Member Clarke, and Mr. Walberg.

Thank you so much for having us here today to discuss DNDO's progress in coordinating the Global Nuclear Detection Architecture, or GNDA, and implementing its domestic component.

DNDO is a unique interagency organization with a singular focus on making nuclear terrorism a prohibitively difficult undertaking for our adversaries. On DO oversight, DNDO continues to build upon the concept of an interagency GNDA.

As we strive to build an effective and efficient nuclear detection strategy, we acknowledge that ability to counter the nuclear threat is fundamentally based on the critical triad of intelligence, law enforcement, and technology.

To maximize our ability to detect and interdict a nuclear threat, it is imperative that we apply these technologies in operations that are driven by intelligence indicators, and place them in the hands of the well-trained law enforcement and public safety personnel.

To this end, we have steadily increased our collaboration with the intelligence community, and we continue to set the training standards and build curricula necessary to train front-line operators. We are now focusing on an architecture that is capable of surging in response to credible information that indicates an imminent threat to our National security. This means that nuclear detection capabilities must be robust, flexible, agile, and well-coordinated. Our multi-layered architecture will indicate partner assets and capabilities into a unified response.

Following completion of the first-ever interagency GNDA strategic plan in December 2010, we worked with our DHS partner components to develop the DHS–GNDA implementation plan. This plan represents the next step in the development of an operational and coordinated capability to search for, detect, and interdict nuclear threats. As this plan illustrates, we are committed to balancing capabilities across the architecture, not just in any one pathway.

Over the past decade DHS has made considerable progress in deploying systems at our land borders and seaports to scan cargo and vehicles for nuclear threats. Our on-going work with the U.S. Customs and Border Protection has resulted in the scanning of over 99 percent of all containerized cargo that enters our Nation at our seaports and via trucks at our land borders.

DHS began deploying the current generation systems in 2003 and many of these are now approaching 10 years of service in the field. While recent studies have shown that the service life of these systems may be significantly longer than originally anticipated, at DNDO we are proactively examining technical methods to improve their operation and capabilities and extend their service life. This includes efforts to ensure that alternative neutron detection technologies are now commercially available and large quantities of helium–3 will no longer be necessary for these systems.

As we look beyond our land and seaports to implement a more balanced National architecture, we will need cost-effective detectors that can be widely deployed and detection systems that can search wide areas, even in the most challenging environments. Such challenges require new materials, such as lanthanum bromide, that can be applied in novel concepts of operation. Recently, we developed the next-generation radioisotope identification device which has improved algorithms and is based on this material, resulting in significantly superior performance.

We worked closely with our partners to identify key operational requirements that drove the new system design, and now we have an easy to use light-based system that is more reliable and has lower maintenance costs due to its built-in calibration and diagnostics feature.

To address the challenge of wide-area search, our long-range radiation detection project seeks to advance technologies that detect, identify, and precisely locate radiation sources at stand-off distances. To allow for nuclear detection along our borders, DNDO is working on network detectors that integrate data from across multiple portable monitors with the goal overall system performance compared to a non-network system.

DNDO is able to strengthen the security triad of intelligence, law enforcement, and technology because of our integrated and holistic approach to preventing nuclear threats through our detection and forensics efforts. Our disciplined and singular focus on nuclear counterterrorism is reinforced by our rigorous systems development process and anchored by the skills and knowledge of our interagency staff, scientists, engineers, current and former law enforcement and military personnel, intelligence professionals, and policy experts.

Thank you again for this opportunity to discuss DNDO's efforts to protect our Nation from a nuclear threat. I would be happy to take your questions.

[The statement of Ms. Gowadia follows:]

PREPARED STATEMENT OF HUBAN A. GOWADIA

JULY 26, 2012

Good morning Chairman Lungren, Ranking Member Clarke, and distinguished Members of the subcommittee. As acting director of the Department of Homeland Security's (DHS) Domestic Nuclear Detection Office (DNDO), I am pleased to testify today with my distinguished colleagues to discuss nuclear detection. My testimony today will focus on the DNDO's progress in coordinating the global nuclear detection architecture (GNDA) and implementing the domestic portion.

DNDO is a unique interagency organization, with staff expertise in technical, law enforcement, military, and interagency issues, focused exclusively on preventing nuclear terrorism. Countering nuclear terrorism is a whole-of-Government challenge, and DNDO works with Federal, State, local, Tribal, territorial, international, and private-sector partners to fulfill this mission. Working in coordination with partners from across the U.S. Government (USG), including DHS components, the Departments of Energy (DOE), State, Defense (DOD), Justice, the intelligence community, and the Nuclear Regulatory Commission, DNDO develops the global nuclear detection architecture (GNDA) and implements the domestic component of the architecture. DNDO also works with its partners to coordinate interagency efforts to develop technical nuclear detection capabilities, measure detector system performance, ensure effective response to detection alarms, integrate USG nuclear forensics efforts, and conduct transformational research and development for advanced detection and forensics technologies.

DNDO continues to build upon the concept of an interagency GNDA. We are working with partners to build a flexible, multi-layered architecture that will strategically integrate Federal, State, local, territorial, and Tribal assets and capabilities into a unified response when intelligence or information indicates there may be a credible nuclear threat. The USG must be able to respond effectively to credible information that indicates an imminent threat to our National security, and, if necessary, surge all available resources in a coordinated manner. Since a surge relies on detection resources that are in place at the time, this places a premium on identifying what is needed to respond to threats and ensuring it will be available if needed. The USG strategy leverages the integrated efforts of Federal, State, local, territorial, and Tribal responders to perform nuclear detection in concentrated regions or areas when information indicates there may be a need for responsive search operations for preventive detection or interdiction. DNDO continues to develop new equipment and technology that is flexible and mobile, enhancing the ability of the USG to respond to radiological and nuclear threats.

DHS GNDA IMPLEMENTATION PLAN

Building upon the interagency GNDA Strategic Plan, which we submitted to Congress in December of 2010, DNDO led the Department's development of the DHS GNDA Implementation Plan. This plan represents the next step in the development of the Department's operational and coordinated capability to respond to radiological and nuclear threats against the homeland. The planning team was made up of representatives from across DHS operational components and headquarters offices, as well as interagency representatives.

The DHS GNDA Implementation Plan identifies specific DHS-led programs and activities that will support the mission, goals, and responsibilities detailed in the GNDA Strategic Plan.

As requested by Congress, the plan also includes current resource planning information based on the Future Years Homeland Security Program.

The GNDA will require constant review to account for changing threats, missions, and technology. Through this implementation planning process, DHS has developed metrics associated with GNDA Strategic Plan performance goals. These metrics define achievement and time lines for each performance goal.

MAINTAINING AND ENHANCING CAPABILITIES AT PORTS OF ENTRY

Over the past decade, DHS has made considerable progress in deploying systems at our borders and seaports to scan cargo and vehicles for radiological and nuclear threats. Through the Radiation Portal Monitor (RPM) program, detection equipment is procured and installed at domestic ports of entry to scan containerized cargo for radiological and nuclear threats, addressing the requirements of the Security and Accountability For Every (SAFE) Port Act of 2006 (Pub. L. No. 109–347). Our on-going work with U.S. Customs and Border Protection (CBP) to facilitate container security has resulted in the scanning of over 99 percent of all incoming containerized cargo for radiological and nuclear threats entering via truck at our land borders and at our seaports, utilizing RPMs. RPMs, coupled with handheld radioisotope identification devices (RIIDs), are the workhorses of our on-going deployments.

Scanning of containerized cargo at seaports of entry will continue, in accordance with SAFE Port Act requirements. However, given the current fiscal environment, DNDO and CBP, working together, will continue to work to balance risk reduction, effectiveness of radiological and nuclear scanning, flow and volume of commerce, and life-cycle costs when determining RPM deployment priorities.

Improvements to Current Generation RPMs

We are looking ahead in anticipation of a future need for enhanced capabilities or new systems for scanning cargo at ports of entry. The RPM program began deployment of the current generation poly-vinyl toluene (PVT) RPMs in 2003 and many of these are approaching the 10-year service life mark. While recent DNDO-funded studies have shown that the service life of PVT RPMs may be significantly longer than was previously anticipated, the oldest RPMs will eventually need to be replaced or refurbished. Given the very significant DHS investment in the RPM program, DNDO has been studying the issue of how to extend the usefulness of this investment and develop the system to its full potential. DNDO's PVT Improvement Program examines technical methods to improve the operations and capabilities of currently deployed PVT RPMs. DNDO plans to complete developmental testing and field validation testing of selected PVT improvement solutions in fiscal year 2013.

Next Generation Handheld Detectors

Radioisotope Identification Devices (RIIDs) are used by law enforcement officers and technical experts during routine operations. To further improve operational nuclear detection capability, DNDO has led the development of a next-generation RIID. We worked closely with CBP, USCG, the TSA, and State and local operators, to identify key operational requirements that drove the design of the new system. Based on an enhanced detection material, lanthanum bromide, and improved algorithms, this new handheld technology is easy-to-use, lightweight, and more reliable, and because it has built in calibration and diagnostics, has a much lower annual maintenance cost. We are currently in the process of deploying these with CBP at POEs.

Advanced Spectroscopic Portals (ASP)

Last year, my predecessor announced the Department's decision to cancel full-scale deployment of the ASP system for either primary or secondary scanning. At the recommendation of the Department's Acquisition Review Board, Secretary Napolitano directed DNDO and CBP to end the ASP program as originally conceived and to instead use hardware left over from the ASP program to collect spectroscopic data from operational environments that can be used to characterize future models and refine operational requirements. Based upon a careful review of needs and resources, DNDO is working with CBP, as well as State authorities, to determine locations for data collection purposes. The data gathered will be used for modeling and to refine requirements, especially in the areas of detecting special nuclear materials in the presence of masking, and for characterizing the effect of conveyance speed control on isotope identification.

DNDO ACQUISITION AND COMMERCIAL ENGAGEMENT STRATEGY

Recognizing the important contributions and innovations of private industry, National laboratories, and academia, DNDO has evolved its acquisition focus from one that is predominantly fueled by a Government-funded, Government-managed development process to one that relies upon industry-led development. As such, all DNDO technology development programs now proceed with a "commercial first" approach—engaging first with the private sector for solutions and only moving to a Government-sponsored and -managed development effort if necessary. This approach takes advantage of industry's innate flexibility and ability to rapidly improve technologies, leveraging industry-led innovation.

This transition will also include a new approach at the systems level, in which strategic interfaces will be clearly defined in the detector/system architecture, allowing system upgrades without wholesale changes. We have shared the DNDO Acquisition and Commercial Engagement Strategy with industry through DHS's Private Sector Office to ensure the commercial sector remains aligned with DNDO's current development and acquisition approach. In some cases, shifting to commercial-based acquisitions will reduce the total time to test, acquire, and field technology.

RESEARCH AND DEVELOPMENT TO SUPPORT AND ENHANCE THE ARCHITECTURE

Along with intelligence and law enforcement, technology is fundamental in our ability to detect nuclear threats. In recent years, there have been dramatic advancements in nuclear detection technology. Thirty years ago, identification of detected nuclear material required laboratory specialists and large, complicated equipment. Now, newer detection materials that can be integrated into mobile and human-portable devices, coupled with advanced algorithms, allow for significantly improved operations. As a result, front-line responders and law enforcement officials now regularly use detection equipment to search for, find, and identify nuclear materials in the field. Technological advances in computing, communications, software, and hardware have also contributed to this revolution in nuclear detection technology.

Despite these advancements, however, developing nuclear detection technology for homeland security applications is an inherently difficult technical task. The fundamental technical challenge for nuclear detection is one of distinguishing signal from noise. Sensors can detect radiation, but detection is limited by several factors, including speed, distance, shielding, and source strength. Compounding these challenges is the difficulty in distinguishing ever-present background radiation from radiation that poses a threat. Additionally, to mitigate risk across all pathways in the GNDA, detection technologies must be capable of operations in challenging environments, such as on the water and in rugged terrain between ports of entry.

While DNDO's work to develop, evaluate, and deploy systems supports the ongoing enhancement of the GNDA, significant technical challenges remain. These challenges include:

- Cost-effective equipment with sufficient technical performance to ensure widespread deployment;
- Enhanced wide-area search capabilities in a variety of scenarios to include urban and highly-cluttered environments;

- Monitoring along challenging GNDA pathways, to include scanning of general aviation and small maritime vessels, and searching for nuclear threats between ports of entry; and
- Detection of nuclear threats even when heavily shielded.

Additionally, our programs must be able to reach out to operators for user requirements and to balance both "technology push" and "technology pull" efforts, as appropriate. For the former, the technology developer is pushing a new concept out for examination by the operator. These systems may be otherwise unknown to operators, and are often state-of-the-art with enhanced or improved threat detection capabilities and may further allow for simplified operational use. Technology pull refers to equipment and programs where operators have identified new concepts of operation and/or features that they need in order to achieve their missions. The operators are constantly pulling the technologies in directions that guide our development of detection systems.

DNDO works to address these challenges through a robust, long term, multi-faceted transformational and applied research and development (R&D) program. I would like to highlight a few of the projects in our transformational R&D portfolio that are showing significant progress and promise.

Helium–3 Alternatives

Helium–3 has been widely used as a neutron detection component for radiation detection devices, such as RPMs. However, in recent years, our country has faced a helium–3 shortage. Years before the recent helium–3 shortage, DNDO was already exploring options for better, more cost-effective, alternatives for neutron detection. DNDO's transformational and applied research efforts included 14 different technologies that could be used instead of helium–3 tubes, including those based on boron or lithium.

Once the shortage was identified, DNDO accelerated this progress and led an interagency working group to address the use of alternate neutron detection technologies. DNDO also queried the commercial marketplace for available systems. At a recently-completed test, present and next generation alternatives from DNDO's research and development and the private sector were evaluated and multiple systems proved to have sufficient performance to replace helium–3 in RPMs. As a result of DNDO's efforts, alternative neutron detection technologies are now commercially available and large quantities of helium–3 will no longer be necessary for use in RPMs. Importantly, due to a collaborative, USG-wide effort to address the shortfall, our U.S. strategic reserve of helium–3 has increased by 40 percent since 2009.

Advanced Radiation Monitoring Device (ARMD)

Our Advanced Radiation Monitoring Device (ARMD) project focuses on enhancing our ability to distinguish benign radiological and nuclear materials, from those that potentially pose a threat. The ARMD project capitalizes on the efficiency and energy resolution of emerging detector crystals, such as strontium iodide (SrI_2) and cesium lithium yttrium chloride, or "CLYC", to develop smaller, more capable detection systems. Through DNDO's efforts, the detector materials have sufficiently matured to the point where they are now commercially available. New handheld detector systems using these crystals are being designed, built, and will soon be ready for formal evaluation by DNDO.

Long Range Radiation Detection (LRRD) Project

Our Long Range Radiation Detection (LRRD) project has the potential to have broad operational impact by significantly improving the range of detectors. Through the LRRD project, DNDO has been developing advanced technologies to detect, identify, and precisely locate radiation sources at stand-off distances, through passive gamma-ray imaging technology. We have focused on two systems: Stand-Off Radiation Detection Systems, which uses a mobile system to locate stationary sources; and the Road Side Tracker, which is a rapidly re-locatable monitoring system capable of identifying and tracking threats in moving vehicles across multiple lanes of traffic. Recent LRRD demonstrations included interagency partners from the technical and law enforcement communities, utilizing a "technology push" to allow operators to use the prototype systems in simulated and operational environments. DNDO is assessing the potential for further development based upon operator feedback and evaluations obtained during the demonstrations.

Networked Detectors

To address nuclear detection in challenging operational environments, DNDO is working on networked detectors. These detectors, being developed in the Intelligent Radiation Sensor System (IRSS) project, are intended to facilitate situational awareness and improve capabilities to detect, identify, locate, and track threats across distributed sensors. The IRSS integrates data from across multiple portable detectors with the goal of improving overall system performance compared to a non-networked system. This technology will support operations where scanning for nuclear threats by routing traffic through checkpoints is not tenable. These operations are conducted at some special security events, between ports of entry along the land border, and include scanning general aviation or small maritime vessels for illicit radiological or nuclear materials.

Detecting Shielded Nuclear Threats

Nuclear threats may be shielded or masked, increasing the challenge for passive detection techniques. To address shielded nuclear threats, DNDO has several important projects. The Shielded Nuclear Alarm Resolution project seeks to develop and characterize advanced active interrogation systems with improved ability to uniquely detect special nuclear material and to resolve alarms with confidence, even in the presence of significant countermeasures (such as shielding). This technology may substantially reduce the number of manual inspections required to resolve alarms, while increasing the probability of nuclear threat detection even when heavily shielded. Technologies of interest include induced fission, high energy backscatter, and nuclear resonance fluorescence.

Recent advancements in the commercial sector have also resulted in technologies that combine the merits of passive and active technologies into a single system through either muon tomography or by integrating radiation detectors into X-ray radiography systems. In theory, these systems should be able to automatically detect nuclear threats, regardless of the shielding level, while providing an image for detecting other anomalies. In order to characterize the full performance capability of these technologies, DNDO recently solicited proposals for our Nuclear and Radiological Imaging Platform Advanced Technology Demonstration. This project will characterize imaging systems for scanning conveyances and identifying possible shielded threats. Results from this demonstration will be available in 2014.

TESTING, EVALUATION, AND STANDARDS FOR NUCLEAR DETECTION TECHNOLOGIES

Over the years, DNDO's test program has grown and matured. To date, DNDO has conducted more than 70 test and evaluation campaigns at over 20 experimental and operational venues. These test campaigns were planned and executed with interagency partners using rigorous, reproducible, peer-reviewed processes. Tested nuclear detection systems include pagers, handhelds, portals, backpacks, and vehicle-, boat- and spreader bar-mounted detectors, as well as next-generation radiography technologies. The results from DNDO's test campaigns have informed Federal, State, local, and Tribal operational users on the technical and operational performance of nuclear detection systems, allowing them to select the most suitable equipment and implement effective concepts of operations to detect nuclear threats.

DNDO has also supported the development, publication, and adoption of National consensus standards for radiation detection equipment. Several such standards now exist for use in homeland security. DNDO collaborated with the National Institute of Standards and Technology to conduct a review of all National and international consensus standards for nuclear detection systems, and formed an interagency working group to draft Government-unique technical capability standards (TCS). Earlier this year, we finalized the first TCS for hand-held systems.

The success of the nuclear detection mission is contingent on timely information exchanges. To this end, DNDO successfully collaborated with the National Institute of Standards and Technology to create a major update of the Data Format Standard for Radiation Detectors used for Homeland Security. This standard facilitates the exchange of detection information by ensuring that the systems create and distribute data in a specified format to enable interoperability. Through the International Electrotechnical Commission (IEC) and the American National Standard Institute, this significantly improved standard (IEC 62755) is now internationally accepted. IEC 62755 was approved in late February 2012.

The DNDO Graduated Radiological/Nuclear Detector Evaluation and Reporting (GRaDER℠) Program builds upon these standards to determine if commercially-available nuclear detection equipment complies with established standards. DNDO created the infrastructure for voluntary, vendor testing of commercial nuclear detection technologies by independent, accredited laboratories against National consensus standards and Government-unique TCS. This program encourages vendors to develop better nuclear detection and identification systems that meet evolving homeland security requirements.

With the maturation of our test and evaluation program, DNDO's collaboration with interagency partners, such as DOE and DOD, and international partners, such as the United Kingdom, Canada, Israel, the European Union, and the International

Atomic Energy Agency (IAEA), has increased significantly. For example, our close partnership with the DOE Second Line of Defense program, European Commission, and the IAEA for the Illicit Trafficking Radiation Assessment Program+10 (ITRAP+10) will result in a comprehensive evaluation of the performance of nearly 100 commercially-available radiation detection systems against National and international standards. ITRAP+10 will allow for the refinement of nuclear detection standards and promote greater homogeneity in United States and international detection standards. The test program will conclude in the spring of 2013.

INCREASED COLLABORATION WITH FEDERAL, STATE, AND LOCAL PARTNERS

Our ability to counter the nuclear threat is fundamentally based on the critical triad of intelligence, law enforcement, and technology. To maximize our ability to detect and interdict nuclear threats, it is imperative that we apply detection technologies in operations that are driven by intelligence indicators and place them in the hands of well-trained law enforcement and public safety personnel.

We have increased our collaboration with the intelligence community. By sharing information, personnel, and requirements, we continue to improve our ability to successfully bring technologies to bear on the nuclear detection mission. Additionally, we have made significant progress in ensuring that law enforcement officers are appropriately trained and equipped for the nuclear detection mission.

DNDO has facilitated the delivery of radiation and nuclear detection training to thousands of Federal, State, and local officers and first responders Nation-wide. Our work with DHS partners has developed cross-sector capabilities for radiation and nuclear detection: All U.S. Coast Guard (USCG) boarding teams and Transportation Security Administration (TSA) Visible Intermodal Prevention and Response teams are equipped with detection capabilities.

DNDO has also made considerable progress in deploying detection equipment. For example, DNDO has made available radiological and nuclear detection training to over 23,000 State and local law enforcement officers and first responders. In the New York City region, the Securing the Cities (STC) program has funded the deployment of nearly 8,500 pieces of detection equipment and provided the requisite training to over 13,000 personnel. This year, DNDO will also select a second region to implement a phased STC program, tailored to build a regional nuclear detection architecture and integrate State and local capabilities into the Federal response framework. DNDO will assist regional partners in implementing self-supported sustainment of capabilities and sharing of data from fixed, mobile, maritime, and human-portable radiation detection systems.

DNDO also supports five Mobile Detection Deployment Units that are operated by our State and local law enforcement partners to provide enhanced detection capability at large public gatherings and special events. With regular use, these units, which are available upon request, are being integrated into exercises, operations, and planning for nuclear search operations in response to threats.

CONCLUSION

DNDO has come a long way since its creation in 2005. With our integrated approach to GNDA planning, testing and assessments, research and development, acquisition, and operational support, we continue to strengthen the Nation's capabilities to detect and interdict nuclear threats. We appreciate your continued support as we work with our partners to develop, evaluate, deploy, and support the necessary systems to implement a nuclear detection architecture that can effectively respond to credible intelligence and threat information.

Chairman Lungren, Ranking Member Clarke, I thank you for this opportunity to discuss the nuclear detection architecture and the progress of DNDO. I am happy to answer any questions the subcommittee may have.

Mr. LUNGREN. Thank you very much.

Mr. Maurer.

STATEMENT OF DAVID C. MAURER, DIRECTOR, HOMELAND SECURITY AND JUSTICE ISSUES, GOVERNMENT ACCOUNTABILITY OFFICE

Mr. MAURER. Good morning, Chairman Lungren, Ranking Member Clarke, and other Members and staff. I am pleased to be here today to discuss DHS's efforts to combat nuclear terrorism.

Mr. Chairman, as you know well, GAO has been following and reporting on this topic for the past several years. In the interests of time, I would like to call your attention to some key themes from my statement at today's hearing.

First and foremost, DHS is learning from its past mistakes. The best evidence of this is the Department's announcement last week that it was canceling the ASP program. Let us be clear, the ASP program was a failure for the Department.

DHS prematurely pushed for full-scale production and deployment before it was clear the system would work in the real world, before unbiased testing demonstrated whether it worked better than existing systems, before completing a rigorous cost-benefit analysis, and without the benefit of a documented strategic approach to explain how the program fit into the broader effort to combat nuclear smuggling.

But that was the past. Today, DHS has an overall strategy and implementation plan. These documents, in tandem, address our prior recommendations that, among other things, DHS define objectives, identify needed funding, and monitor progress. These documents are not perfect. We would like to see clearer articulation of priorities and a more robust discussion of anticipated resource needs. But they do demonstrate that DHS has changed for the better.

The Department has also modified its overall approach. Today, DHS is less focused on deploying static radiation portal monitors and is placing greater emphasis on flexible approaches, deployable technology, and more attention to other aspects of the detection architecture.

Looking ahead, DHS and Congress face some tough decisions. We have already invested billions of dollars in the currently deployed radiation detection technology. Some of these systems are starting to reach the end of their expected service life. DHS is currently studying whether to refurbish or replace its current system.

Regardless of what path DHS takes, it will likely cost billions of dollars and take several years. With that in mind, it is important for DHS to position itself for the future. However DHS decides to modernize its existing capabilities, it should, No. 1, test before it buys. Any investment in new systems should include sufficient and rigorous testing to ensure they meet mission needs.

No. 2, make sure new technologies meet the operational needs of the people who will be using them every day. No. 3, conduct a cost-benefit analysis to ensure the benefits from new systems are worth the costs in taxpayer dollars. Finally, ensure that decisions on what to buy are driven by the Department's strategies and plans, and not the other way around.

Now, keep in mind, detection technology is an important part of the overall effort to keep a nuclear device out of the United States, but it is not the only one. Consider this, if the United States ever has to rely on a radiation portal monitor to stop a smuggled nuclear device, a lot of other things have already gone wrong.

It means law enforcement missed it, the intelligence community missed it, our allies missed it, risk-based screening missed it, treaty regimes didn't work, and non-proliferation programs failed. All of these—play a key role long before detection technology at ports of entry come into play, and they should not be overlooked. That is why it is so important for the United States to have a clear and coherent strategy to tie all these various pieces together.

The bottom line, keep your eyes on the billions that DHS will be investing in the future, hold DHS accountable for its strategies, and GAO will be there to help with that oversight, and remember that technology is one part of a much larger effort.

Mr. Chairman, thank you for the opportunity to testify this morning and I look forward to your questions.

[The statement of Mr. Maurer follows:]

PREPARED STATEMENT OF DAVID C. MAURER AND GENE ALOISE

JULY 26, 2012

Mr. Chairman, Ranking Member Clarke, and Members of the subcommittee: I am pleased to be here today to discuss the efforts of the Department of Homeland Security's (DHS) Domestic Nuclear Detection Office (DNDO) to develop and deploy a global nuclear detection architecture (GNDA)—an integrated system of radiation detection equipment and interdiction activities to combat nuclear smuggling in foreign countries, at the U.S. border, and inside the United States—and to provide an update on the deployment of radiation detection equipment at U.S. borders. Preventing terrorists from using nuclear or radiological material to carry out an attack in the United States is a top National priority. DNDO is charged with, among other things, enhancing and coordinating the nuclear detection efforts of Federal, State, local, and Tribal governments and the private sector to ensure a managed, coordinated response.[1] Among other things, DNDO is required to coordinate with other Federal agencies to develop an enhanced GNDA. It is also responsible for developing, acquiring, and deploying radiation detection equipment to support the efforts of DHS and other Federal agencies. While Federal efforts to combat nuclear smuggling have largely focused on established ports of entry, such as seaports and land border crossings, DNDO has also been examining nuclear detection strategies along other potential pathways in the architecture, including: (1) Land border areas between ports of entry into the United States, (2) international general aviation, and (3) small maritime craft, such as recreational boats and commercial fishing vessels.

Even before DNDO's inception in 2005, we were highlighting the need for a more comprehensive strategy for nuclear detection. In 2002, we reported on the need for a comprehensive plan for installing radiation detection equipment, such as radiation portal monitors, at all U.S. border crossings and ports of entry.[2] In July 2008, we testified that DNDO had not developed an overarching strategic plan to guide the development of a more comprehensive GNDA, and we recommended that DHS coordinate with the Departments of Defense, Energy, and State to develop one.[3] DHS agreed with our recommendation. In January 2009, we recommended that the Secretary of Homeland Security develop a strategic plan for the domestic part of the global nuclear detection strategy to help ensure the success of initiatives aimed at closing vulnerabilities in the United States.[4] We stated that this plan should focus on, among other things, establishing time frames and costs for the areas DNDO had identified—land border areas between ports of entry, aviation, and small maritime craft. DHS did not comment on this recommendation but noted that it aligned with DNDO's past, present, and future actions. The status of these recommendations is discussed later in this testimony.

As we will discuss today, DHS has made meaningful progress in deploying radiation detection equipment at U.S. border crossings and seaports; however, as deployed portal monitors begin to reach the end of their expected service lives, DHS will soon need to make decisions about whether to refurbish or replace them. DHS

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[1] National Security Presidential Directive 43/Homeland Security Presidential Directive 14, *Domestic Nuclear Detection,* April 15, 2005. DNDO was established in statute by the Security and Accountability for Every Port Act of 2006 (SAFE Port) Act, Pub. L. No. 109–347, § 501, 120 Stat. 1884, 1932 (codified as amended at 6 U.S.C. § 591).

[2] GAO, *Customs Service: Acquisition and Deployment of Radiation Detection Equipment,* GAO–03–235T (Washington, DC: Oct. 17, 2002).

[3] GAO, *Nuclear Detection: Preliminary Observations on the Domestic Nuclear Detection Office's Efforts to Develop a Global Nuclear Detection Architecture,* GAO–08–999T (Washington, DC: July 16, 2008).

[4] GAO, *Nuclear Detection: Domestic Nuclear Detection Office Should Improve Planning to Better Address Gaps and Vulnerabilities,* GAO–09–257 (Washington, DC: Jan. 29, 2009).

has also made progress in developing key planning documents to guide the GNDA. This testimony discusses: (1) DHS's efforts to complete the deployment of radiation detection equipment to scan all cargo and conveyances entering the United States at ports of entry, (2) observations from our past work that may help DHS as it considers options for deploying new technologies to refurbish or replace existing portal monitors when they reach the end of their expected service lives, and (3) our assessment of the extent to which DHS has addressed our prior recommendations.

This testimony is primarily based on our prior work on Federal efforts to detect and prevent the smuggling of nuclear and radiological materials, issued from October 2002 through July 2011. We have updated our prior work in this testimony to reflect DHS's continuing efforts to deploy radiation detection equipment. To do so, we met with DHS, DNDO, and Customs and Border Protection (CBP) officials and reviewed DHS documents including the GNDA strategic plan, the 2011 GNDA Joint Annual Interagency Review, and the GNDA implementation plan issued in April 2012. As part of our update, we asked for, and DHS provided, a classified briefing that compared the GNDA capabilities with the expected capabilities of adversaries who may wish to smuggle nuclear material into the United States. Details on the scope and methodology for our prior reviews are available in our published reports. We conducted this work in accordance with generally accepted Government auditing standards.

In summary, over the past 10 years, DHS has made significant progress in deploying radiation detection equipment to scan for nuclear or radiological materials in nearly all trucks and containerized cargo coming into the United Stated through seaports and border crossings. However, challenges remain for the agency in developing a similar scanning capability for railcars entering this country from Canada and Mexico, as well as for international air cargo and international commercial aviation. As portal monitors approach the end of their expected service lives, observations from our past work may help DHS as it considers options to refurbish or replace such monitors. Among other things, we have previously reported that DHS should: (1) Test new equipment rigorously prior to acquisition and deployment, (2) obtain the full concurrence of the end-user to ensure that new equipment meets operational needs, and (3) conduct a cost-benefit analysis to inform any acquisition decisions. In our past work on the GNDA, we recommended that DHS develop an overarching strategic plan to guide the development of the GDNA, as well as a strategic plan for the domestic part of the global nuclear detection strategy. DHS took action on these recommendations and, in December 2010, it issued the interagency GNDA strategic plan.[5] We reported, in July 2011, that the GNDA strategic plan addressed several of the aspects of our prior recommendations but did not: (1) Identify funding necessary to achieve plan objectives or (2) employ monitoring mechanisms to determine progress and identify needed improvements. In April 2012, DHS issued its GNDA implementation plan, which addresses the remaining aspects of our recommendations by identifying funding dedicated to plan objectives and employing monitoring mechanisms to assess progress in meeting those objectives. However, in both the GNDA strategic plan and the implementation plan, it remains difficult to identify priorities from among various components of the domestic part of the GNDA.

DHS HAS MADE PROGRESS DEPLOYING RADIATION DETECTION EQUIPMENT AT LAND BORDERS AND MAJOR SEAPORTS, BUT CHALLENGES REMAIN

Over the past decade, DHS has made significant progress in deploying radiation detection equipment and developing procedures to scan cargo and conveyances entering the United States through land and sea ports of entry for nuclear and radiological materials, but it has made less progress with other pathways. In 2010, we reported that DHS initially planned to deploy more than 2,100 portal monitors to U.S. ports of entry. Due to funding constraints and challenges in developing new technologies, DHS is updating its portal monitor deployment plan by reducing the number of portal monitors it planned to deploy and increasing its reliance on portable systems. Specifically, according to DHS officials, DHS has deployed about 1,465 of the approximately 1,537, or 95 percent, of radiation portal monitors that it now plans to deploy; the agency expects to complete this deployment by December 2014.[6] As we reported in 2011, since 2009, DHS has scanned nearly all of the containerized cargo and conveyances entering the United States through land borders and major

[5] The GNDA strategic plan was an interagency effort jointly developed by the Departments of Homeland Security, Energy, Defense, Justice, and State; the intelligence community; and the Nuclear Regulatory Commission.

[6] Radiation portal monitors are large stationary detectors through which cargo containers and vehicles pass as they enter the United States.

seaports for nuclear and radiological materials.[7] However, as we reported in 2010 and 2011, DHS has made less progress scanning: (1) Railcars entering the United States from Canada and Mexico and (2) international air cargo and commercial aviation aircraft, passengers, and baggage.[8]

Land Ports of Entry

As we reported in 2011, according to DHS officials, since November 2009, almost all nonrail land ports of entry have been equipped with one or more radiation portal monitors. Of the about 1,465 portal monitors deployed, as of July 2012, 917, or about 63 percent, have been deployed along the Northern and Southern Borders of the lower 48 States to all but a few nonrail ports of entry. According to DHS officials, 100 percent of all containerized cargo, conveyances, drivers, and passengers entering the United States through commercial lanes at land borders are scanned for radiation, as are more than 99 percent of all personally-operated vehicles (noncommercial passenger cars and light trucks), drivers, and passengers.

Seaports

According to DHS officials, the Department scans nearly all containerized cargo entering U.S. seaports for nuclear and radiological materials. Specifically, of the about 1,465 portal monitors, DHS has deployed 453, or about 31 percent, of radiation portal monitors to major American seaports—including the largest seaports accounting for the majority of cargo. However, some smaller seaports that receive cargo may not be equipped with portal monitors. DHS officials told us they will know how many more portal monitors will be deployed to these smaller seaports when the agency completes its updated deployment plan in September 2012. Furthermore, in July 2012, these officials told us that, due to increased cargo volume at some major seaports, additional portal monitors may be needed to avoid delays in moving cargo through larger ports. In such cases, DHS officials told us that they are considering cost-sharing arrangements with seaport operators, whereby DHS and seaport operators would share the cost of additional portal monitor deployments. Under such arrangements, DHS would continue to purchase, maintain, and operate these additional portal monitors, but the seaport operators would share in the cost of deploying them.

International Rail

As we reported over the last 2 years, DHS has made limited progress with regard to radiation scanning of the roughly 4,800 loaded railcars in approximately 120 trains entering the United States each day from Canada and Mexico through 31 rail ports of entry.[9] Although, most international rail crossings have radiography systems to scan the majority of cargo, much of the scanning for nuclear and radiological materials that takes place at these ports of entry is conducted with portable, handheld radioactive isotope identification devices. This scanning is triggered when, for example, anomalous readings are detected from imaging scans of railcar contents. According to DHS officials, international rail traffic represents one of the most difficult challenges for radiation detection systems. Specifically, in June 2010, they told us that rail traffic poses unique operational challenges due to the length of the trains (up to 2 miles), the distance required to stop moving trains, and the difficulties in separating individual cars for further examination. Furthermore, DHS officials told us that rail companies typically own the land where DHS would need to establish stations for screening, and these companies often resist doing things that might slow down rail traffic. Moreover, DHS officials told us that an effective solution would require scanning of at least some rail traffic on Mexican or Canadian soil, and they said that it will take time to develop the close cooperation with officials in Mexico and Canada necessary to do so. Accordingly, in 2010, DHS undertook an International Rail Threat and Gap Study to determine the most promising radiation detection approach. In July 2012, DHS officials said that the agency is presently in the final stages of completing a second study analyzing technological and operational options. DHS officials told us that decisions about additional enhancement of radiation detection capabilities at international rail ports of entry are pending the results of this analysis and the Department's broader consideration of the

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[7] GAO, *Combating Nuclear Smuggling: DHS has Developed a Strategic Plan for its Global Nuclear Detection Architecture, but Gaps Remain,* GAO–11–869T (Washington, DC: July 26, 2011).

[8] GAO, *Combating Nuclear Smuggling: DHS Has Made Some Progress but Not Yet Completed a Strategic Plan for its Global Nuclear Detection Efforts or Closed Identified Gaps,* GAO–10–883T (Washington, DC: June 30, 2010) and GAO–11–869T.

[9] GAO–10–883T and GAO–11–869T.

needs and priorities of the GNDA. The second study is due to be completed in September 2012, according to DHS officials.

International Air Cargo and Commercial Aviation

DHS has made less progress scanning air cargo and commercial aviation for nuclear and radiological materials. As of July 2012, DHS was scanning for nuclear and radiological materials at certain major international airports in the United States using some portal monitors. CBP also utilizes radioactive isotope identification devices and personal radiation detectors to alert the agency to the presence of such materials.

DHS officials told us in June 2010 that they were studying options for effectively deploying portal monitors to increase their capacity to scan for nuclear and radiological materials in international air cargo conveyed on commercial airlines. According to these DHS officials, their experience scanning air cargo at a few major international airports in the United States has led them to conclude that the deployment of radiation portal monitors is not feasible at many locations due to the lack of natural choke points, where scanning would take place. Furthermore, these officials stated that scanning 100 percent of air cargo would be technically and logistically challenging and would require significant investment in equipment, staffing, and maintenance resources. Moreover, further DHS analysis since June 2010 has shown that there are no procedural or operational changes that can easily overcome the logistical and resource challenges associated with airports. Until solutions to these challenges can be found, DHS officials told us that the scanning for radioactive materials that occurs at airports will continue to be conducted primarily with handheld detectors where portal monitors are not deployed.

Similarly, DHS does not scan all commercial aviation aircraft, passengers, or baggage for radioactive materials with portal monitors. However, passengers are scanned for radioactive materials with radioactive isotope identification devices when DHS is alerted to the presence of radiation by CBP officers' personal radiation detectors, and some baggage is scanned by radiation portal monitors at selected overseas airports.

OBSERVATIONS FROM OUR PAST WORK FOR DHS TO CONSIDER WHEN REPLACING PORTAL MONITORS

As deployed portal monitors reach the end of their expected service lives, observations from our past work may help DHS as it considers options for deploying new technologies as to whether to refurbish or replace them. DHS has been procuring portal monitors for about 10 years, and DHS officials estimate that the expected service life of many of these portal monitors is about 10 to 20 years. Their service lives can be extended by refurbishing their key components but doing so also requires some additional investment. In July 2012, DNDO and CBP officials told us they are working on a portal monitor replacement strategy that is due to be completed in 2013. As DHS considers options to refurbish existing systems, or replace them with new systems, observations from our past work may help the agency make the most informed decisions, mitigate risks, and produce expected outcomes. Specifically, we believe it is important that DHS consider the following:

- *Taking into account the overall priorities of the domestic side of the GNDA before making investments or reinvestments in ports and border crossings*.—Ports and border crossings have received most of the investment of radiation detection technologies because these are the areas through which a significant amount of cargo must pass, and Federal law requires certain scanning at seaports.[10] However, as discussed earlier, other pathways also pose risks. As we reported in 2011, any additional investment in radiation detection equipment needs to be consistent with the highest priority needs of the domestic side of the GNDA, including examining and balancing the needs and risks of all smuggling pathways into the United States.[11] In July 2012, DHS officials told us they agreed that further investment in detecting radiation in ports and border crossings needs to be consistent with the overall needs of the GNDA.
- *Testing new equipment rigorously prior to acquisition and deployment*.—One of the principal findings of our past work reviewing DNDO's efforts to develop and procure the advanced spectroscopic portal—a more advanced radiation portal monitor—was that initial testing was not rigorous enough.[12] Once the testing

[10] 6 U.S.C. §921 (2006).
[11] GAO–11–869T.
[12] For further information regarding our work on the advanced spectroscopic portal, see GAO, *Combating Nuclear Smuggling: Additional Actions Needed to Ensure Adequate Testing of Next*
Continued

became more rigorous, these portals did not perform well enough to warrant deployment, and the program was subsequently cancelled, after DNDO had spent more than $280 million on development and testing costs. Consistent with our past recommendations, any investment in new equipment should include sufficient and rigorous testing to ensure that any new selected equipment performs well enough to meet mission needs. DNDO officials told us that DNDO is currently working on a collaborative effort with the radiation detection agencies of the European Union to test the capabilities of currently available radiation detection equipment, including portal monitors, from multiple vendors. This testing is part of the Illicit Trafficking Radiation Assessment Program and is not connected to any planned acquisition; instead, it will provide performance information on a variety of radiation detection equipment. According to DHS officials, the final report from this testing is expected in 2013, and DNDO could use the results as part of its basis for considering whether to replace currently deployed portal monitors with other devices.

- *Obtaining full concurrence of the end user—CBP—to ensure that any new equipment meets CBP's operational needs*.—Our past work on the advanced spectroscopic portal and DNDO efforts to develop a system to use radiography to scan cargo for nuclear materials found that DNDO did not fully understand: (1) How CBP used existing radiation detection equipment in a port environment or (2) the extent of the space limitations in port environments.[13] Consistent with our past findings, decisions to rehabilitate or replace currently deployed portal monitors need to be made with the full buy-in of CBP—particularly if the decision involves new equipment or technologies. Obtaining early buy-in from CBP will help ensure any new equipment is consistent with CBP's operational needs.
- *Conducting a cost-benefit analysis to inform acquisition decisions*.—A key part of deciding whether to refurbish or replace currently deployed portal monitors is conducting a comprehensive cost-benefit analysis that can be used to compare the relative costs and expected benefits of existing versus new equipment. Consistent with our past recommendations in 2006 on portal monitors, such an analysis should articulate what enhanced performance could be expected of new equipment and whether this benefit is worth its cost.[14]

DHS'S GNDA STRATEGIC AND IMPLEMENTATION PLANS ADDRESS OUR PAST RECOMMENDATIONS BUT DO NOT YET CLEARLY DEFINE PRIORITIES

In our past work on the GNDA, we made recommendations about the need for a strategic plan to guide the development of the GDNA. Among other things, in July 2008, we recommended that DHS develop an overarching strategic plan for the GNDA that: (1) Clearly defines the objectives to be accomplished, (2) identifies the roles and responsibilities for meeting each objective, (3) identifies the funding necessary to achieve those objectives, and (4) employs monitoring mechanisms to determine programmatic progress and identify needed improvements.[15] DHS agreed with our recommendation. In January 2009, we recommended that DHS develop a strategic plan for the domestic part of the global nuclear detection strategy and that this plan focus on establishing time frames and costs for addressing previously identified pathways within the architecture—land border areas between ports of entry, aviation, and small maritime vessels.[16] DHS did not comment on this recommendation but noted that it aligned with DNDO's past, present, and future actions.

DHS has taken action on these recommendations. In December 2010, DHS issued the interagency GNDA strategic plan and in April 2012, it issued its GNDA implementation plan for domestic aspects of the GNDA. As we reported in July 2011, the 2010 GNDA strategic plan addresses several aspects of our prior recommendations—including defining program objectives and assigning roles and responsibil-

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Generation Radiation Detection Equipment, GAO–07–1247T (Washington, DC: Sept. 18, 2007); and GAO, *Combating Nuclear Smuggling: DHS Improved Testing of Advanced Radiation Detection Portal Monitors, but Preliminary Results Show Limits of the New Technology,* GAO–09–655 (Washington, DC: May 29, 2009).

[13] GAO, *Combating Nuclear Smuggling: Recent Testing Raises Issues About the Potential Effectiveness of Advanced Radiation Detection Portal Monitors,* GAO–10–252T (Washington, DC: Nov. 17, 2010) and GAO, *Combating Nuclear Smuggling: Inadequate Communication and Oversight Hampered DHS Efforts to Develop an Advanced Radiography System to Detect Nuclear Materials,* GAO–10–1041T (Washington, DC: Sept. 15, 2010).

[14] 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 DC: Mar. 22, 2006).

[15] GAO–08–999T.

[16] GAO–09–257.

ities.[17] However, it did not: (1) Identify funding necessary to achieve plan objectives or (2) establish monitoring mechanisms to determine progress and identify needed improvements. DHS officials stated at that time that they intended to include these aspects of our recommendations in an upcoming implementation plan.

Our review of the April 2012 GNDA implementation plan found that DHS had made progress in both identifying funding dedicated to plan objectives and in employing monitoring mechanisms to assess progress in meeting plan objectives. Furthermore, the plan has established specific milestones for completing many of DHS's activities—allowing a further assessment of whether progress is being made according to plan time frames. In our view, these actions address the intent of our 2008 recommendations to identify necessary funding and employ monitoring mechanisms. The plan also discusses strategies for addressing previously identified pathways in the domestic portion of the GNDA, including time frames and costs for key elements of DHS' approach. While these pathways remain an area of concern, the strategies discussed in the plan address our 2009 recommendations and lay out an approach to making nuclear smuggling through these pathways more difficult and thus less likely to succeed. As DHS updates the implementation plan in the future, providing additional details and discussion about how the strategy will address the pathways in the domestic GNDA could better position DHS to make decisions regarding resource allocations.

However, in both the GNDA strategic plan and the implementation plan, it remains difficult to identify priorities from among various components of the domestic part of the GNDA. As we reported in July 2011, one of the key benefits of a strategic plan is that it is a comprehensive means of establishing priorities and using these priorities to allocate resources so that the greatest needs are being addressed.[18] In times of tight budgets, allocating resources to address the highest priorities becomes even more important. Identifying priorities would help inform DHS's decisions to refurbish or replace portal monitors or invest in radiation detection equipment for other potential pathways. DHS has done a comprehensive analysis of GNDA capabilities and compared its capabilities with the expected capabilities of adversaries who may wish to smuggle nuclear material into the United States. This classified analysis provides data that DHS could use as a basis to set priorities within the GNDA. DHS officials told us they agreed that the implementation plan did not yet articulate specific priorities for GNDA program areas with the greatest need for development and resources and that the DHS classified analysis of GNDA capabilities could help inform those priorities. These officials told us the implementation plan was an iterative document that was designed to be periodically updated and that future versions of the plan would provide a greater discussion of priorities.

Mr. Chairman, Ranking Member Clarke, and Members of the subcommittee, this concludes my statement. I would be happy to answer any questions that you may have at this time.

Mr. LUNGREN. Thank you very much.

Mr. Oxford.

STATEMENT OF VAYL S. OXFORD, NATIONAL SECURITY EXECUTIVE POLICY ADVISOR, PACIFIC NORTHWEST NATIONAL LABORATORY

Mr. OXFORD. Good morning, Chairman Lungren, Ranking Member Clarke, and other distinguished Members of the committee, it is a pleasure to be here to discuss PNNL's support to DHS in formulating and executing an effective and efficient nuclear detection strategy.

At PNNL we have a long legacy of supporting Federal, State, local, private, and international users to protect them from and help them recover from WMD attacks. We find solutions for DHS, NNSA, DOE, DOD, DIC, and other Federal agencies.

Today, about half of what PNNL spends of its $1.1 billion budget is devoted to National security missions. Our mission-focused approach always considers the operational environment and the oper-

[17] GAO–11–869T.
[18] GAO–11–869T.

ators executing this mission, including the CVP officers at the ports of entry, the Border Patrol agents between ports of entry, the Coast Guard personnel protecting the maritime environment, the TSA officers protecting the transportation venues, and State and local and Tribal first responders.

PNNL has also been deeply involved in many aspects of the nuclear detection strategy to include a decade of support of DHS and NNSA deploying radiation detection portal monitors to U.S. land and seaports of entry, and ports of departure around the world.

We provide expertise and support to DHS to formulate strategies that balance risk reduction and total program costs, including long-term O&M costs associated with various technologies. We evaluate emerging technologies and concepts of operation for application in non-PON, like Ondoc and international rail, to include analysis of alternatives, technologies assessments, life-cycle cost estimates and threat definitions.

We identify new detection materials to include the resolution and processing time in detecting rad/nuc threats. We provide strategic planning, program support, training and overseas installation in material, control and accountability and second line of defense of radical new detection systems.

Last year PNNL supported efforts in over 100 foreign countries. Since 2002, PNNL has been an integral part of the DHS radiation portal monitor program, deploying rad/nuc detection technologies at approximately 530 U.S. ports of entry. This support extended to working with DHS, NNSA, and other National laboratories to identify alternatives to the helium–3 shortage for neutron detection.

Finally, we perform preliminary analysis for the anticipated life cycle for the currently deployed RPMs, and propose sustainment strategies to extend their life cycle while assessing associated costs. Significant progress has been made in the last 10 years to protect the Nation from the threat of nuclear terrorism, but there is still much work to be done. That work involves developing and executing risk-based strategies associated with all vectors into the country that are integrated with other security programs in DHS and across the U.S. Government.

We must consider the current status of our deployed systems. The second line of defense and mega ports programs are currently transitioning to sustainment in current capabilities and coverage overseas. Domestic coverage includes scanning over 99 percent of all incoming containerized cargo at land and sea ports of entry.

We are conducting preliminary pre-clearance of passenger and baggage at some foreign airports. We are sustaining a maritime security program in the Puget Sound to protect against the small vessel maritime threat. We continue the Securing the Cities Program in New York, and expansion to a second city is expected in 2013. DHS is now requiring and deploying the next generation handheld radiation detection systems to enhance GDP to field operations.

Finally, we have equipped the U.S. Coast Guard boarding and TSA Viper teams with radiation detection capabilities. Despite these successes, there are areas that we are involved, including addressing threats in general aviation and commercial air cargo, expanding the small maritime vessel programs, looking at areas between ports of entry, and finally, an expanded major urban area concentration.

In closing, PNNL has provided critical support to the formulation and implementation of nuclear counterterrorism efforts around the globe and is ready to continue that support, especially in light of the threat of nuclear terrorism has not diminished.

I thank you for the chance to appear before you today and welcome any questions you might have.

[The statement of Mr. Oxford follows:]

PREPARED STATEMENT OF VAYL S. OXFORD

JULY 26, 2012

INTRODUCTION

Chairman Lungren, Ranking Member Clarke, and other distinguished Members of the committee, it is a pleasure to be here and discuss PNNL's support to DHS in formulating and executing an effective and efficient nuclear detection strategy. This is a very important issue; one that I personally consider critical and worthy of great attention, and resources that demands the collective efforts of the USG and the international community. I have devoted much of my career to combating the threat of weapons of mass destruction (WMD) with the focus ranging from developing offensive capabilities to locate, exploit, and defeat WMD-related facilities to developing policies and approaches to interdict illicit transfers of WMD-related materials and technologies to combat the threat of nuclear terrorism.

Pacific Northwest National Laboratory (PNNL) has a long history of providing valuable support to numerous Federal, State, local, private, and international users to protect them from and help them recover from WMD attacks. PNNL is one of ten U.S. Department of Energy (DOE) National Laboratories managed by DOE's Office of Science (SC). Our support strengthens the Nation's foundation for innovation, and we find solutions for not only DOE, but for DHS, the National Nuclear Security Administration (NNSA), the Department of Defense (DoD), the intelligence community, other Government agencies, universities, and industry. Our multidisciplinary technical teams are brought together to address the Nation's most pressing issues in energy, environment, and National security through advances in basic and applied science.

ROLE OF DOE LABORATORIES

The DOE and NNSA complex of National Laboratories, which are and have been a vital centerpiece of the Nation's research and development capabilities for over 60 years, continue to play a prominent role in developing and deploying technologies to protect America against evolving threats, most especially, the rad/nuc threat.

Important objectives of DOE's multi-program science laboratories are to accelerate the rate of innovation, steward unique National capabilities, and leverage the National science base for the benefit of diverse applied missions. The rad/nuc detection research programs at PNNL successfully illustrate how these objectives come together. We have scientific and engineering strengths and historic capabilities with roots dating back to the Manhattan project of the 1940s at the Hanford Site. Today, approximately half of PNNL's $1.1 billion business is centered on National security missions. Threat detection technology development and deployment is a central part of these programs and one in which science plays a particularly critical role.

FRONT-LINE OPERATORS

It is important to note that the most critical element of the nuclear detection strategy is the brave men and women who execute this important mission day in and day out—the U.S. Customs and Border Protection officers at our ports of entry (POE), the Border Patrol (BP) agents between our POEs, the U.S. Coast Guard (USCG) personnel monitoring our waterways, the Transportation Security Administration (TSA) officers defending transportation venues, and the State, local, and Tribal first responders, and international partners. Nuclear detection is just a single aspect of one of many missions they execute each and every day, and the role of technology is to enable these tremendously capable men and women, to make the mission of interdiction of nuclear threats more efficient, more effective, and less onerous. PNNL takes great pride in the opportunities afforded it to work alongside and partner with mission personnel to understand their requirements and operational environments. We are committed and work hard to support them in the execution of all aspects of their mission and to provide them with operationally and technically effective and efficient solutions to their requirements.

To successfully detect and interdict nuclear materials requires an informed encounter. There are three elements in an informed encounter: (1) Know the signature or indications of illicit nuclear trafficking, (2) place your personnel or assets in a position where they have the opportunity to sense or observe the signature of indication, and (3) accurately interpret the indications when presented. Clearly technology can play a role in this process, but there is no substitute for well-trained law enforcement personnel.

It is also important to consider all of the actions we can take to detect illicit nuclear trafficking activities. Nuclear detection technology has and will continue to play a critical role. However, this is only one source of relevant data. There are other physical sensors that could play an important role. Imagine if operators were able to determine if someone has been in the presence of nuclear materials though a simple hair sample. Additionally, operators clearly need more capable information sensors. The number and diversity of data sources continues to increase and provides a key opportunity to identify illicit trafficking activities. However, the ability to ingest and analyze the sheer quantity of data requires new solutions that will only be realized through additional research and development that is currently being undertaken at PNNL and other National Laboratories.

In the end, all of these tools are either collecting data for or actually performing the analysis to find signatures of illicit nuclear trafficking. Signatures are not new in this business, but it is important that we continue to systematically look for new signatures. The new signatures are likely to combine disparate data or approaches to increase sensitivity and specificity. However, new signatures must be evaluated for accuracy, the cost and risk to collect them, and whether they change or evolve over time. Finally, it is crucial that we provide an integrated framework that allows the analysis and decision-making—by analysts, front-line operators, and senior officials.

PNNL'S ROLE IN THE EVOLUTION OF THE NUCLEAR DETECTION STRATEGY

Initial response to the terrorist events of 9/11 included far-reaching and comprehensive strategies for technology deployment across various points or layers for possible interdiction including: The place of origin for nuclear materials or weapons, foreign border crossings and airports, ports of departure, ports of entry, between the ports of entry, and the target. In particular, PNNL has supported the deployment of radiation detection equipment for over a decade in partnership with DHS and NNSA to achieve initial post-9/11 and SAFE Ports Act scanning goals at domestic POEs and ports of departure (POD) around the world.

Since 9/11, DHS has a more mature assessment of the nuclear threat and a deeper understanding of how to evaluate the risks through various technology insertion strategies. Coupled with the current budget realities, new strategies are emerging that balance risk reduction and total program costs, including the long-term operations and maintenance (O&M) costs associated with various technologies. As an example of how the risk analyses have matured, the new analyses more accurately recognize the fact that the presence of uniformed CBP officers and BP agents at POEs and BP checkpoints, along with the extensive range of regulatory and security functions performed by officers/agents provides for a substantial deterrent and makes the POEs a significantly less desirable entry path into the country. Hence, new, risk-based strategies for radiation detection equipment at the POEs are currently being generated.

The risk-based analyses highlight key gaps and vulnerabilities. These gaps need to be solved through a combination of material and non-material solutions. Over the last few years, DHS has implemented rigorous systematic approaches to define and address these gaps. In support of these systematic approaches, PNNL has been providing expertise and support to DHS in formulating and executing these new strategies. This support includes risk analyses, evaluation and deployment of technologies, technology pilots, O&M strategies, and impact analyses, etc.

PNNL STRATEGIC SUPPORT TO THE DEVELOPMENT AND IMPLEMENTATION OF A DHS STRATEGY

PNNL has been a strategic partner with DHS and its interagency partners and supported the development and implementation of the nuclear detection strategy. Those partners include CBP and BP, USCG, and TSA within DHS; NNSA; and DoD. Specific support to DNDO, responsible within DHS for the development of the

GNDA, has included assisting with the development of the first GNDA Strategic Plan that was delivered to Congress in December 2010, conducting numerous architectural studies of potential threat pathways, collaborating on the development of a risk analysis model, and determining potential efforts to strengthen relationships between the GNDA and the interagency. PNNL has provided this strategic support since its initiation in 2005 and continues to this day.

One example worth noting that illustrates the unique role PNNL plays in supporting DHS architecture advancement is the development of the Rad/Nuc Risk Analysis Model (RNRAM) in collaboration with Battelle Memorial Institute. This improved RNRAM, compared to previously-employed risk analysis tools, will allow DNDO to more easily and quickly determine risks associated with the GNDA and incorporate the most recent information for more timely results.

PNNL participated in several characterization surveys of the major and minor airports in metropolitan areas. These survey teams were led by CBP with representatives from DNDO and PNNL. The fact gathering at the airports, including the obtaining of extensive information on stakeholders, cargo handling procedures, and CBP's inspection and cargo release process, supported the development of an approach to study the scanning opportunities for international air cargo. PNNL conceptualized cargo movement, captured it as stylized diagrams, and developed a matrix of conceptual rad/nuc scanning systems versus cargo encounter locations. PNNL also developed a potential volume model that makes use of commercial flight data and other open source data to quantify international air cargo movement around the airport. The model estimates the percentage of cargo volume passing various encounter locations at an airport.

PNNL managed the Puget Sound portion of DNDO's West Coast Maritime Pilot project. Activities included pilot exercise series, which began with the Concept Development Conference and ended with a full-scale exercise. The pilot agencies were eager to sustain the capability developed in the Puget Sound. Sustainment was coordinated for the region through the Puget Sound Area Maritime Security Committee, and they secured a Port Security Grant, the first of its kind for rad/nuc detection. The grant will fund the continued maintenance of detection equipment in the region, new equipment for new agency participation, and additional training.

PNNL is currently doing work for DNDO in the international rail environment by using modeling and testing to support the analysis-of-alternatives work that includes technology assessments, concept of operation development, life-cycle cost estimates, deployment task definitions, port of entry site surveys, and threat definition. However, the fact remains that the operational constraints in the rail environment are quite daunting to perform rad/nuc detection efforts.

CBP does utilize imaging systems along the Mexican and Canadian border to inspect international rail traffic. PNNL has been involved in efforts to both evaluate and optimize system performance.

In the area of new detection materials, PNNL has been using its expertise in materials discovery to identify, select, and develop new materials that will improve the resolution and processing time in detecting radiological and nuclear devices. Experts now have a greater understanding of the potential materials covering the four conventional semiconductor material classes. They were able to narrow over 2,000 material compositions to a list of 245 that may have comparable performance characteristics to cadmium zinc telluride, a well-known radiation detection material. This work has drawn collaborative interests from multiple industrial and academic partners with plans to develop new detection instruments, increasing effectiveness in the field.

As DHS, the interagency, industry, and academia advance the technology and materials used in the detection of rad/nuc materials there needs to be a commensurate testing and evaluation program to ensure those systems and materials detect the types of threats we are concerned with. In addition, they should be tested in an environment that closely approximates the operational environment to ensure the systems or materials can withstand the rigors of front-line operators like CBP, USCG, or TSA.

DEPLOYMENT SUPPORT TO DHS AND NNSA

PNNL's strategic support to the nuclear detection strategy stems from our unique understanding of the operational environment, both domestically and internationally. Over the past 2 decades PNNL has been a part of or managed for the U.S. Government large-scale deployment programs of rad/nuc detection systems that are an essential component of a layered defense strategy. Part of that strategy involves securing rad/nuc materials at its source overseas. Locking down proliferation concern materials where they legally reside is critically important and much progress has been made by the various Cooperative Threat Reduction (CTR) programs involved with this work. Over the years PNNL has provided strong leadership, sound programmatic recommendations, and high-value technical contributions supporting the management of projects, strategic planning, training, infrastructure development, and the overseas installation of Material Protection Control and Accounting (MPC&A) and Second Line of Defense (SLD) rad/nuc detection systems in support of the Office of International Materials Protection and Cooperation (NA–25) in NNSA. Last year alone, PNNL provided its capabilities in over 100 foreign countries through staff travel or relocation as part of these programs and NNSA's Global Threat Reduction Initiative (GTRI) which seeks to secure radiological sources in foreign countries that might be used for a radiological dispersal device (RDD), also known as a "dirty bomb."

PNNL subject matter experts in the fields of system engineering, protective forces, physical protection, material control and accounting, radiation detection, physics, materials science, training, procurement, and technically-related project management helped NNSA execute large, highly-visible nuclear nonproliferation/National security projects around the globe. These same experts have been utilized by the DoD as part of its Guardian Program that seeks to deploy rad/nuc detection systems at U.S. military bases domestically and overseas.

Since 2002, PNNL has been an integral part of DHS' Radiation Portal Monitor Program (RPMP) which deploys rad/nuc detection technology to scan incoming international traffic and cargo for illicit radioactive materials at approximately 530 ports of entry into the United States while maintaining the uninterrupted flow of legitimate trade and travel.

PNNL support to RPMP also includes tapping into our scientific expertise to tackle such technical issues as supporting efforts to transition the Nation's portal monitoring activities away from the current neutron detection standard, which is based on the now highly-constrained helium–3 (He–3) commodity, toward more sustainable solutions. Several DOE labs, in conjunction with industry, the DNDO, and NNSA, played critical roles in driving innovation and evaluating technology so that today's detection system needs are met with commercial instrumentation that does not consume precious He–3. In the longer run, improved detection systems will require more rapid discovery of new materials with advanced capabilities. To this end, laboratories such as PNNL have focused on the fundamental science necessary to understand how and why radiation detection materials function as they do.

Another example of PNNL work involves improving the capability of currently deployed RPMs via advanced algorithms. RPMs operate via algorithms that allow the technology to detect radiation from threatening materials, but these algorithms sometimes result in a large number of alarms from naturally-occurring radioactive materials (NORM) as well. The current data provided by the RPMs make it difficult to directly distinguish between the two, thus requiring a referral to secondary inspection. PNNL is adapting its anomaly detection algorithms to improve the detection of illicit rad/nuc materials. In addition, PNNL also continues to make significant progress on the DNDO-sponsored Energy Window Optimization Initiative. The initial results indicate a potential for modest reduction of alarms due to NORM on deployed RPMs while holding the threat detection probability constant through optimization of existing system settings.

SUSTAINMENT OF CURRENT DOMESTIC ARCHITECTURE

When deployment started in 2002 as part of RPMP, the RPMs were estimated to have a 10-year life cycle. However, the deployment of RPMs across U.S. POEs is the first of its kind on this scale. While regular maintenance is part of RPM sustainment, the goals of upgrading for improved performance, controlling costs, eventual replacement of aged systems, and maintaining configuration commonality are fundamentally in conflict. Thus, the best approach to sustaining and replacing these systems is still being developed. PNNL is analyzing the anticipated life cycle for an RPM and proposing sustainment strategies to extend their life cycle and understand the associated costs.

PNNL has also used its expertise in RPM technology to support CBP operations across a full range of engineering work including maintaining and upgrading individual pieces of hardware and software to managing the service of entire systems. Two of PNNL's key support functions are trouble call handling and calibration. For example, PNNL provided subject matter expertise via phone support to CBP's Enforcement Technology Program as needed regarding preventive maintenance, repairs, and improvements to ensure installed systems remain fully operational. PNNL staff also calibrate systems annually to prevent long-term drift or degradation, minimizing the effects of the recalibration process on port operations. PNNL is also assisting CBP's Enforcement Technology Program in sustaining fully-transitioned RPM equipment and related systems within CBP so that all systems continue to operate as planned in detecting threats.

PNNL also plays a key role in the management and execution of the sustainability strategy under NNSA's SLD program. Maintaining the operational effectiveness of foreign deployed rad/nuc detection systems is critically important and PNNL operates a help desk that provides as-needed troubleshooting assistance to foreign partners. Implementing robust preventative maintenance programs, tracking system performance, developing partner-country training capabilities and providing assistance in the creation of National alarm response plans are all activities that PNNL leads on behalf of NNSA to help ensure long-term risk reduction is achieved.

CONSIDERATIONS FOR NEXT STEPS

Although significant progress has been made across the last decade to protect the United States from the threat of nuclear terrorism, there is still work to be done. Much of that work involves developing and executing strategies associated with all pathways into the country that are risk-based and highly integrated with all security programs in DHS and throughout the USG.

In order to discuss next steps associated with an effective strategy to combat the threat of nuclear terrorism, it is important to summarize some high-level views of the significant progress that has been made to date that PNNL has directly supported:

- On the international front, the SLD program is increasing its focus on both the sustainment of deployed radiation detection systems and expanding the provision of mobile "surge" radiation detection technologies to special law enforcement agencies.
- Implementation at the POEs, in the maritime vector, for general aviation, and within cities:
  - Scanning over 99% of all incoming cargo at land and sea ports of entry;
  - Preliminary pre-clearance of international general aviation aircraft at foreign airports;
  - Successful maritime pilot demonstration and sustained program in the Puget Sound to protect against the small maritime vessel threat;
  - On-going Securing the Cities program in the New York City region and an expansion to a second city expected in 2013;
  - Acquisition and deployment of the next generation handheld radiation detection system to enhance CBP's field operations;
  - Successful equipping of the USCG boarding teams and TSA Visible Intermodal Prevention and Response (VIPR) teams with radiation detection capabilities.

Despite these successes there are still areas of the DHS detection strategy that will continue to evolve including:

- General aviation and commercial air cargo;
- Small maritime vessels;
- Areas between POEs;
- Protection of major urban areas;
- Next-generation detection and imaging technology.

PNNL stands poised to continue to support DHS in further developing and executing these evolving strategies.

CLOSING

Mr. Chairman and Members of the committee, protecting the Nation from a nuclear attack has been at the top of U.S. Government priorities for at least the last 11 years and PNNL has been honored to provide essential support to U.S.G. strategy formulation and implementation of nuclear counterterrorism efforts around the globe and stands ready and prepared to continue its support. There is still much work left to be done. Advanced risk analyses and highly-integrated strategies need to emerge to ensure capabilities are not eroded but actually improve, despite current fiscal realities since, unfortunately, the threat of nuclear terrorism has not diminished. I thank you for the chance to appear before you today and welcome any questions you might have.

Mr. LUNGREN. Thank you very much, all the panelists, and I thank you for staying within the time of 5 minutes each.

We will start our round of questioning.

First of all, Mr. Maurer, thank you for the work that you have done and GAO has done on this and helping us for a vigorous oversight. I was interested to see someone who attended Michigan State and the University of Michigan. You don't show any of the schizophrenic attitude I would expect from somebody like that.

Mr. WALBERG. It doesn't happen in Michigan.

Mr. LUNGREN. It doesn't? Oh, it doesn't happen in Michigan? Yes.

I would say this. We will continue in our efforts to assist DNDO in becoming better. There are very good people that have been there. Very good people that are there now. Obviously, some mistakes were made in the past. You have pointed out, given us some avenues of inquiry to continue with. We thank you for that.

Dr. Gowadia, you told us a year ago the ASP program was not successful, official cancellation of it. We spent a lot of money on it. GAO representative has given us reasons where there is valid criticisms of it.

My concern is: Do you have a suitable follow-up program? How far along are we on that? How are we going to avoid making the same mistakes we made with the ASP program?

Ms. GOWADIA. Thank you, Chairman Lungren.

I want to assure you that despite the fact we cancelled the ASP program, current port security has not been adversely affected. We continue to seek to improve the portal monitoring systems we already have in the field, and extend their service life. We are also deploying much more depth capability for hand-held detection systems with our CVP partners for field operations.

When it comes to lessons learned, we have definitely stepped up, based on your oversight and GAO's recommendations, process within not just the Department, but within DNDO itself. We have a far more rigorous solution development process. We have evolved our strategies to looking at surge concepts in global architectures. All around, the rigor in our program management and execution has certainly turned up——

Mr. LUNGREN. I was saying the follow-on program to ASP is not necessarily the single technological fix that ASP would, but a panoply of approaches using current technology and some tweaks to current technology?

Ms. GOWADIA. Exactly, sir. We are not looking at the architecture anymore at a single——

Mr. LUNGREN. Okay.

Ms. GOWADIA. So we will use this generation and next generation for software.

Mr. LUNGREN. Okay. Let me ask you about the GNDA, the Global Nuclear Detection Architecture. The plan that we received from their office calls for the Department to spend nearly a billion dollars in the next 5 years on radiation detection imaging equipment fixed sites. Per your figures, only 10 percent of the planned funding will go to acquiring equipment for scanning international rail and air cargo. Are you satisfied this is the right risk balance?

Ms. GOWADIA. Sir, the imaging systems that are fairly expensive actually apply to far more than just the nuclear detection mission. International rails and in air cargo we are making significant progress, not just from the technical perspective, but looking at both modes holistically.

For example, in air cargo, 70 percent of incoming air cargo is express mail or consignment cargo. One hundred percent of that is scanned before it comes into the country. So again, we are looking across the board at all parts of the Global Nuclear Detection Architecture to implement a balanced approach.

Mr. LUNGREN. In response to a letter from Chairman King of this committee, both DNDO and CVP indicated, "there is no National plan" for recapitalizing radiation portal monitors. I am trying to figure out what that answer means, consistent with what you have just told us here?

Ms. GOWADIA. We are looking very carefully with CVP on the life extension programs and improving the detection systems that are presently in the field. Future strategies will not be a one-for-one portal exchange. It may even come to using a mix of mobile and agile technologies in conjunction with the systems that are out there.

So we are in the process of doing those studies, sir. I think we will have some answers for you—better answers for you—as we go through our planning this year.

Mr. LUNGREN. Thank you very much.

The Ranking Member is recognized.

Ms. CLARK. Thank you, Mr. Chairman.

To Dr. Gowadia, the Global Nuclear Detection Architecture Implementation Plan contains details on what we just have spent on various activities within the domestic of GNDA. So rather than focus on past expenditures, do you plan to have more information about future programmatic budgetary needs as you update the plan? Wouldn't it be one way to better articulate priorities within DNDA?

Ms. GOWADIA. Certainly, ma'am. Actually, the plan is forward-looking and it does describe what we will be doing across our presently-planned 5-year budget. Now, this was a static snapshot. I will give you that. This was our first go-around. With every year we look through our gap vulnerabilities and address and adapt those adversaries. Those mixes will change, but we do intend to keep up, keep looking at that plan on a regular basis.

Ms. CLARK. You plan to make it much more dynamic going forward?

Ms. GOWADIA. Absolutely.

Ms. CLARK. Okay. The GNDA strategic plan was released in 2010, and DHS-GNDA implementation plan was released in 2012. Between these dates, the DHS, through its component agencies, continued work on the GNDA by funding and operating those programs contributing to the GNDA. How did the release of the GNDA strategic plan change the day-to-day operation of programs, like the use of RPMs at the U.S. border by CVP?

Ms. GOWADIA. It would be hard for us to make a direct link from a high-level USG-wide strategic plan down to the tactical operations of, say, a port. However, the roles and responsibilities that we signed up to win that strategic plan, all of us coming together to agree upon those objectives and goals is beginning to drive our planning process moving forward. We see that reflected to a certain extent in the implementation plan for the first generation. I sincerely hope you will we see more of it as we go along.

Ms. CLARK. Then just finally, what do you plan on doing with the 13 ASP units? What is the disposition of that?

Ms. GOWADIA. Actually, thank you for giving me the opportunity to speak about the ASP. Just to give you a couple of things. Last year at this time, Warren—Mr. Stern—was here and told you about the cancellation of the ASP program. I want to assure you that in July of last year when the last contract expired we did not spend any further money with contracts for ASP.

The Secretary did cancel the program and sent a letter to Congress in October of last year. What you received last week was just the next step in the process where the Acquisition Review Board closed out the action item.

Ms. CLARK. Okay.

Ms. GOWADIA. The 13 portals that we have, some of them will go to State agencies who are interested in deploying some of these along their borders. In fact, I believe New Mexico is getting one this month. So we continue to try to learn and expand the knowledge we have, data that we can collect.

Ms. CLARK. So then, in transferring the unit it then becomes the responsibility of the State for any further development with it, any maintenance of it? What is the relationship?

Ms. GOWADIA. I do not have all of the details on the MOU. I know that they wouldn't develop it further, but I know that we will be partnering with them to get a lot of the data and the knowledge moving forward.

Ms. CLARK. Thank you very much.

Mr. Maurer, how did PNNL in its role as a testing site, coordinate between CVP and DNDO of these systems?

Mr. MAURER. Are you talking about during the testing process for the original development of ASP?

Ms. CLARK. Correct, sir.

Mr. MAURER. Correct? The PNNL played a coordination role. The specifics varied depending on what level of testing and what stage in the testing process you were talking about. I can provide additional details for the record, if you would like.

Ms. CLARK. That would be helpful, sir.

Mr. Chairman, I yield back.

Mr. LUNGREN. Thank you.

The gentleman from Michigan is recognized for his time.

Then, we have heard from the floor that things are going a little more slowly there, so we might have a little more time here. But that doesn't mean you should use any more time than you need.

Mr. WALBERG. Well, thank you, Mr. Chairman. I am not schizophrenic about Michigan State or Michigan U either.

Representing both institutions in my district, Mr. Maurer, I would concur that there is no schizophrenia, that is just quality experience.

Thanks for being here.

Thanks to the rest of the panel as well.

Mr. Maurer, the recent GNDA implementation plan states performance measures of achieving 100 percent radiation scanning of sea cargo, and over 80 percent of rail and air cargo within the next 3 years.

In your opinion, are these appropriate performance goals? In your opinion, does the Department have a credible technology acquisition plan and cost estimate for achieving these performance goals?

Mr. MAURER. I think those are reasonable performance goals the Department has set for itself as the targets for accomplishing what they need to do in the future. Particularly in the rail environment, that has been one of the more critical vulnerabilities, or potential vulnerabilities.

I know that DHS has taken a number of efforts to try to address the rail environment. That one is particularly challenging. Some of it gets down to the fact that you just can't stop a large freight rail train in its tracks if you get a hit, so there is some challenges around that.

But I think it is important for DHS to have that as a goal going forward. In terms of the technology, one of the things that we are going to be watching carefully over the next couple of years is the results of DHS's on-going work to develop new technologies to supplement what it currently has in place. The current systems have been the backbone of radiation detection capabilities at DHS for a number of years and it has significantly enhanced their capabilities.

However, they really need to take advantage of new technologies, particularly to address some of the challenges, be detecting shielded radioactive sources as well in the rail environment. So we will be watching that carefully and seeing what develops over the course of the next year.

Mr. WALBERG. But you are positive in your sense of the movement forward, that is it is not simply adequate, but it is staying with the curve, ahead of the curve?

Mr. MAURER. Yes, absolutely. We think that DNDO is on the right path. We are encouraged by the recent changes in its overall approach. We are encouraged by the fact that they now have a strategy and implementation plan in response to our recommendations. The key for us, from an oversight perspective, is seeing what they do to execute on those plans and strategies.

Mr. WALBERG. Okay. Expanding on that, the Department of Homeland Security continues to experience difficulty in acquiring new technology. We have seen, as you have indicated, millions of dollars wasted on failed efforts to develop security technologies. The ASP plan already being a prime example of that.

In your opinion, could you expand on I guess some of the root problems with the Department's approach to technology acquisition?

Mr. MAURER. Absolutely. Some of its members sort of diverted in the past, and DHS is taking measures to address some of these problems. But generally speaking, there was a tendency a few years ago to push the deployment of new technology before it was really ready. In other words, trying to make decisions about deployment before it had been adequately tested to show that it actually worked in a real-world environment. That was one significant challenge that DHS faced.

Another challenge that it faced was the Department traditionally has had some pretty robust guidance for its overall acquisition programs, its policies. When you read them on a piece of paper it looks quite sound. They weren't always complying and following with those policies. That is something that we have some on-going on. We will be issuing a report on that relatively soon and talking about where they are now. They are making progress, but there is still some ways to go on that.

Then finally, another key challenge they face is that oftentimes the portions of DHS that were developing the new technologies weren't talking to the actual end-users, the eventual end-users, of those systems. So sometimes there were some pretty significant disconnects between the folks developing the technologies and the people who actual had to use them on a day-to-day basis. Once again, DHS has a number of plans in place right now to address that problem, and we will be watching them carefully to make sure that they carry them out.

Mr. WALBERG. Okay.

Mr. Chairman, unless you would give me the opportunity to ask another question, knowing that it is getting close to the time ending.

Mr. LUNGREN. Well, let me ask Mr. Marino if he has some questions. Then if you have some more I think we might have some time.

Mr. Marino from Pennsylvania.

Mr. MARINO. Nothing, sir.

Mr. LUNGREN. Well, then I would ask the gentlelady if she has further questions?

Ms. CLARK. Sure.

Just quickly to Dr. Gowadia. The Domestic Nuclear Detection Office develops and coordinates, as time would have it, Global Nuclear Detection Architecture. Many Federal departments participate in implementing it even within DHS, and many DHS components participate.

Given the involvement of the multiple agencies, how does DNDO achieve its statutory mission of implementing the domestic portion of GNDA?

Ms. GOWADIA. Thank you, Congresswoman Clarke. We actually have multiple ways in which we do that. First and foremost, we do work closely with our DHS operational components, CDC, Coast Guard, TSA, working with them closely to get their images or requirements, make sure that those are coupled with our rigorous analysis of the architecture and where weaknesses and vulnerabilities exist.

So that is how we start programs. Now, sometimes that is a technical program, sometimes it could be a training program, it could be a policy issue. That is the Federal end of things. We also work with our State and local partners very closely. They have been tremendous supporters of this mission and I believe all of you commented on their law enforcement skills.

So I go back to the notion of, again, that security triad. How do we bring to bear the technologies that are available from our end with law enforcement skills and intelligence skills to make sure that as a Federal, State, and local enterprise we are doing our best to counter nuclear terrorism?

Ms. CLARK. Just quickly to follow that, is there a metric involved?

Ms. GOWADIA. Yes, some metrics are reflecting an annual review, their first—the one from last year I believe got us some initial metrics. This year's, you will see a little bit. We will continue to build on those initial metrics. Also, our implementation plan allows us to track progress.

Ms. CLARK. Very well.

Thank you, Mr. Chairman, I yield back. I know Mr. Walberg has a question.

Mr. LUNGREN. Mr. Walberg.

Mr. WALBERG. Thank you, Mr. Chairman.

Mr. Oxford, at the National Laboratory, you need to have forward-looking plan to support technology development and sustain a world-class technical workforce.

In your opinion, has the Department shared with you a sufficiently detailed plan for its upcoming technology acquisition programs?

Mr. OXFORD. Congressman, what we do is work closely with places like DNDO. We actually advise them in many cases of where some of the gaps and some of the issues are surrounding either emerging technologies, or the existing technology.

We will provide information that contributes now to what Dr. Gowadia mentioned as their solution development process, informing analysis of alternatives so they can make cost-effective decisions as new technology comes about. We also get directly involved in tests and evaluation of existing or emerging technologies.

For example, we supported an initiative to look at Ondoc rail straddle carrier detection systems to find out whether that is a feasible solution in the Ondoc rail or the seaport environments. So it was a good collaborative effort, allowing us not only to support their on-going efforts, but to look into the future to look at changes.

For example, we were directly involved in the helium–3 alternative discussion based on our background. So there is a very robust discussion allowing us to look forward.

Mr. WALBERG. So it is a working relationship where I am to understand that it is certainly is them coming and saying, "Here is a challenge that we have. These are some things that we need developed, processes?" But also could I conclude that you would be suggesting to them concerns, options, and capabilities?

Mr. OXFORD. Absolutely. We advise them on components of the Global Nuclear Detection Architecture. I would also work directly with them on looking, for example, as I mentioned in my opening statement, the sustainment of the current RPM program. It is not just an operational and maintenance issue. There are technical aspects of that that allow us to continue that program while DNDO determines what the future life cycle of a deployed system might look like.

Mr. WALBERG. Thank you.

Thank you, Mr. Chairman.

Mr. LUNGREN. Dr. Gowadia, about the ASP. That was at least presented to us as a program intended to improve performance for equipment for things such as false positives in sensitivity to shielded nuclear materials. But you folks have presented to us that it just didn't work based on the way that we thought it did and it was not worth continuing.

My question is: Why would States want something that is not working? Somehow it is going to work better because the State is operating it? Or I am really kind of confused on this.

Ms. GOWADIA. Chairman Lungren, as we were going through our field validation, we discovered that the jointly-developed specifications for the ASP system—I believe CDTMS developed this jointly in 2007—no longer reflected accurately the operational concerns that CVP faces. So specifically, truck speed in secondary inspection exceeds 2 miles an hour, and the design specification called for 2 miles an hour.

In the State and local weigh station environment, for example, they are able to control truck speed up to 2 miles an hour. So it is a—operational environment and the technology is suited for being used there. Again, what we will learn from these deployments is the impact of the speeds on the performance of the system. That was one of the things we intend to gain from our partnership with the States.

Mr. LUNGREN. I appreciate that very much.

I think we only have a few minutes to go to vote, so anybody else have a question?

We want to thank you for making a presentation before us. We appreciate very much the work that you are doing and the spirit of cooperation with which you have worked with this subcommittee.

Once again, I would like to say that I very much appreciate the participation that we had at the classified briefing and the number of people that were available to us for answering our questions. I hope that both in classified briefings and in open hearings we can continue with this dialogue.

I think it is very important. What you do at DNDO is as important as anything that is being done at DHS, and in my opinion as important as anything that is being done in the Federal Government.

We want to make sure that we get it right. We will work with you to make sure that we get it right to the extent that we can participate and that means active oversight. I assure you it is not partisan.

It is a bipartisan commitment and the concerns expressed by the Ranking Member are concerns I believe shared by all members about some of the past performance, with the recognition that, again, good people are working over there attempting to try and solve some very, very difficult problems.

I thank the witnesses for their valuable testimony, and Members for their questions. Members of the committee may have some additional questions for the witnesses that they would submit to you in writing. We would ask that you would respond to them in writing.

We thank you for your service. We thank you for your participation.

The hearing record will be held open for 10 days.

The subcommittee's hearing is adjourned.
[Whereupon, at 10:47 a.m., the subcommittee was adjourned.]

APPENDIX

QUESTIONS FROM CHAIRMAN DANIEL E. LUNGREN FOR HUBAN A. GOWADIA

Question 1. We have learned that the Department of Energy (DOE) is phasing out its Megaports Program, which was deploying new radiation detection equipment at foreign ports.

Does that mean that DHS will have to do even more scanning at our domestic ports to make up the difference?

Question 2. In the fiscal year 2013 Presidential budget request, neither DHS nor DOE requested any funds for the deployment of radiation portal monitors (RPM's) at domestic and foreign ports.

Based on this fact, please explain why RPM's are being de-emphasized in the overall Global Nuclear Detection Architecture (GNDA) strategy.

Answer. In keeping with the U.S. National Strategy for Global Supply Chain Security, DHS uses a layered, risk-based approach to cargo security that includes a variety of risk mitigation measures, including (among others) advance information, automated targeting, and inspection and scanning of cargo by personnel or technological means, both at domestic ports and in foreign trading partner ports. Radiation Portal Monitors (RPMs), whether provided via Megaports at foreign ports or deployed domestically, are but one example of this broader security system.

In the layered defense provided by the Global Nuclear Detection Architecture (GNDA), there are detection capabilities at various points along the pathways that nuclear and radiological materials might follow to get to the United States. Cargo scanning is but one part of that defensive posture. At this stage in the development and implementation of the GNDA, cargo scanning with RPMs is seen as one of a number of priorities that, in total, will result in a comprehensive, layered defense. This layered defense also includes sustainment of existing Megaports sites and equipment abroad, as well as expanding use of mobile detection methodologies like Human Portable Radiation Detection Systems.

It should also be noted that the Megaports Program is not being phased out. The Megaports Program continues to provide technical support to terminal operators and foreign counterparts who undertake this work, and is considering potential cost-sharing deployments in the out-years. Furthermore, the planned reduction in funding would not impact the equipment that has already been deployed in countries around the world.

Question 3a. Figures provided by DNDO indicate that less than 1% of the planned acquisition funding for new radiation detection equipment over the next 5 years will be dedicated to international rail port of entries.

Why is DNDO not putting more resources on this important aspect of the GNDA?

Question 3b. In testimony, it appears that it is technically feasible to monitor rail cargo as it enters the United States, but that there are logistical and operational barriers. Can you please describe these barriers and what actions need to be taken in order to remove these barriers?

Answer. Radiological and nuclear detection for freight rail cargo is technically challenging due to several factors, including those that impact logistics and operations for scanning freight trains. These include the length of railcars, the required stand-off distances from rail tracks for installation of detection equipment to scan trains, limited space, attenuation of any radiation through rail cargo and rail car structures, the speed of the train passing a detector, and legitimate commerce such as fertilizer and ceramics that can set off false alarms.

U.S. Customs and Border Protection (CBP) currently has 26 rail imaging systems deployed Nation-wide—18 rail imaging systems are deployed on the Northern Border and 8 systems are deployed on the Southern Border. These 26 systems provide CBP with the capability to examine up to 99% of all arriving rail traffic for the presence of contraband. Suspect containers can be further examined using hand-held radiation detectors for the presence of radiological and nuclear materials. Thus, the current funding profile for international rail cargo scanning was determined through a systematic process that considered budget levels; maturity and challenges faced by current technologies; and the ranking of other priorities within the global nuclear detection architecture. Consistent with this approach, DNDO is conducting an Analysis of Alternatives (AoA) for International Rail that is considering technical, operational, and logistical issues as part of the evaluation process. Based on the AoA findings and the DNDO Transformational and Applied Research Directorate (TARD) proof of concept evaluation, the funding profile for international rail cargo will be re-examined in comparison to other priority efforts as the results of these studies are reviewed.

In the technology development area, TARD is planning to explore technology concepts to address the rail cargo scanning challenges. TARD is participating in the AoA effort and will leverage data gathered during this study to assist in the evaluation of technologies. During fiscal year 2013, DNDO will conduct a freight rail scanning-related proof of concept evaluation for new and developing technologies. Based on the AoA findings and relevant technology evaluation, the funding profile for international rail cargo scanning can be re-examined.

Question 4. The Securing the Cities Program (STC) has successfully put radiation detector technology in the hands of first responders throughout the New York metropolitan area.

What made the STC acquisition so successful, and how can we apply or expand that model to other Departmental acquisitions?

Answer. The Securing the Cities (STC) program's success stems from effective management techniques applied to a focused capability development process. STC is not a standard acquisition program, but a financial assistance instrument allowing the grant awardee to procure the necessary commercial off-the-shelf radiation detection equipment and associated support. The program emphasizes a cooperative regional structure for radiation detection, unified under one grant recipient who enters into sub-awards with other principal area partners. This structure allows procurement of standardized equipment and brings all regional players together under a common concept of operations. DNDO maintains substantial involvement throughout the grant's period of performance and all phases of the STC program to ensure State and local acquisitions satisfy local requirements, as well as Federal program requirements. DNDO's technical assistance supports planning, strategy development, equipment acquisition, concepts of operation development, standard operating procedures development, training, exercises, and assessment activities, as well as sustainment and maintenance analysis.

The STC methodology has been standardized for replication to other high-threat, high-density urban areas to provide for radiation/nuclear detection capability. A replication of this program within other Department components would require an assessment of program fundamentals, such as outcomes (end-state), expectations, and cooperative agreements that partner State, local, and Federal resources into a coherent effort. A best practice for integrated programs leverages existing infrastructure and capabilities while taking advantage of current technology and partnerships. Additionally, a costs-versus-benefits assessment of the program will be needed to understand the overall value of an implemented program.

Question 5. The Department's nuclear detection strategy cross-cuts many U.S. Government and foreign agencies.

Is there specific coordination aspects that you believe need to be improved and are there legislative solutions that may help?

Answer. The coordination of the development of the Global Nuclear Detection Architecture (GNDA) is of great importance. DNDO has seen great success in working with our Federal, State, and local partners to implement the domestic portion of the GNDA. DNDO's authorities provided by the Security and Accountability for Every (SAFE) Port Act of 2006 (Pub. L. 109–347) and the Implementing Recommendations of the 9/11 Commission Act of 2007 (Pub. L. 110–53), have underscored the need for a cooperative working relationship with interagency and intra-DHS partners. Through continued productive engagement with our DHS and interagency partners, we are able to frequently discuss our collective efforts to build effective nuclear detection architecture to detect and report on the illicit trafficking of radiological and nuclear materials across our borders.

DNDO also coordinates with the Departments of Defense, Energy, and State, which have primary responsibility for overseas implementation of the GNDA, including with foreign countries and on U.S. Government international activities.

Question 6a. The technology providers for DNDO (e.g. industry and the National Laboratories) have stated that it is very difficult to plan their technology development efforts due to insufficient information regarding the Department's acquisition plans.

Has DNDO shared the GNDA Implementation Plan with its technology providers?

Question 6b. Are there specific actions that DNDO can take in order to improve the effectiveness and efficiency of its technology supply chain?

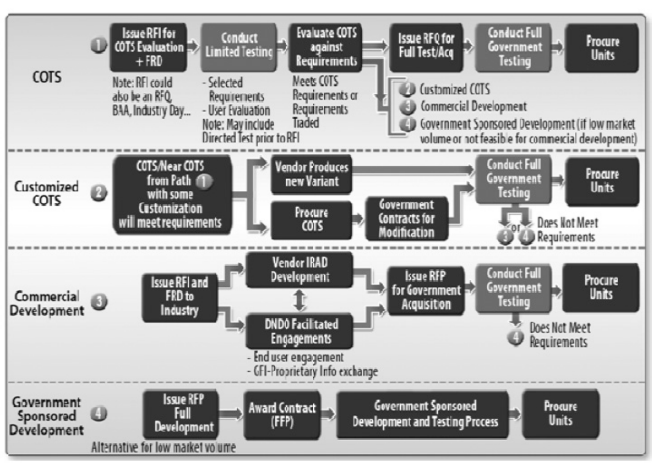
Answer. Consistent with the Federal Acquisition Regulation, the Domestic Nuclear Detection Office (DNDO) uses a variety of mechanisms to exchange information with industry to improve the understanding of Government requirements, including Broad Agency Announcement, Requests for Information, Industry Days, Presolicitation Notices, Draft Request for Proposals/Quotations, and one-on-one meetings with potential vendors. DNDO works with its partners to coordinate interagency efforts to develop technical nuclear detection capabilities, measure detector system performance, ensure effective response to detection alarms, integrate USG nuclear forensics efforts, and conduct transformational research and development for advanced detection and forensics technologies. We collaborate and coordinate efforts through shared review of Broad Area Announcements, Requests for Proposals, and through interagency portfolio reviews. Additionally, we interact and exchange technical information for research and development efforts under a Memorandum of Understanding with relevant parties.

DNDO is currently planning an Industry Day for the first quarter of fiscal year 2013, where information about the Government's upcoming programs and anticipated programs and acquisitions will be discussed and an overview of the GNDA Implementation Plan will be provided. In addition to these mechanisms, technology providers may access a wealth of publicly available budget and planning information through the Office of Management and Budget's website.

Additionally, in August 2012, DNDO hosted National Laboratory Information Day to promote an understanding of the current activities and future plans for GNDA program development and analysis and to provide an opportunity for APD staff to learn about National Laboratory programs and specialized areas of expertise that can support current and future GNDA activities. Staff members from seven National Laboratories attended the event.

DNDO has also implemented a Commercial First Initiative to improve the effectiveness and efficiency of its technology supply chain. The goal of DNDO Commercial First Initiative is to leverage the commercial marketplace to maximize the use of commercially available products, to engage commercial vendors to focus their internal product development efforts to meet the validated needs of DNDO and its stakeholders, and to invest in solutions to meet these needs. There are several "commercial first" pathways that a program can follow (as shown in the below graphic) depending on the defined gap and the technical maturity and commercial availability of potential material solutions that may be able to address that gap. These pathways include:

- Commercial-Off-The-Shelf (COTS)
- Customized COTS
- Commercial Development
- Government Sponsored Development



Question 7. Given that it has been 1 year since the cancelation of the ASP program, and DNDO has still not deployed any first-production ASP units in the field, we are now requesting that DNDO please provide a monthly report that includes the following information:

- Number of ASP units in storage;
- Number of ASP units deployed, their location, and the operating agencies;
- A full accounting of the $16.1 million that was dedicated for ASP deployments, including amount expended, and amount remaining;
- Monthly reports shall continue until all ASP units have been deployed or until all remaining funds have been expended, whichever occurs first.

Answer. DNDO will provide a monthly report that contains the following information:

- Number of Advanced Spectroscopic Portal (ASP) units in storage (For Official Use Only/Law Enforcement Sensitive Information Attachment)*
- Number of ASP units deployed including the location and operating agency of each system (For Official Use Only/Law Enforcement Sensitive Information Attachment)*
- An accounting of the $16,072,560 that was dedicated for ASP deployments, including amount expended and amount remaining.

The data will be updated and provided on a monthly basis, as requested; however, given that the location and operating agency of each system constitutes Law Enforcement Sensitive information, this data will be appropriately marked and provided separately.*

Please note that the $16,072,560 in Systems Acquisition funds also included funds for the Radiation Portal Monitor Program (RPMP). Thus, the amount originally dedicated for ASP deployments was $13,251,591 instead of $16,072,560 (QFR referred to this as $16.1 million). As of 27 July 2012, there is $6,495,591 available for the deployment of ASPs to support data collection. The balance of remaining funds is reflected in the table below.

Description	Amount in Dollars
ASP LRIP Deployment Support	$13,251,591
RPMP Deployment Support	2,570,969
Additional RPMP Deployment Support	250,000
TOTAL for RPMP and ASP Deployment	16,072,560
ASP LRIP Deployment Support	3,251,591
Deobligation 1QFY12	(600,000)
ASP LRIP Deployment Support	12,651,591
Transferred to RPMP support 4QFY12	(7,500,000)
Available for ASP LRIP Deployment Support	5,151,591
Expended through 27 July 2012	(656,000)
Remaining as of 27 July 2012	4,495,591

Questions From Ranking Member Yvette D. Clarke for Huban A. Gowadia

Question 1. The Domestic Nuclear Detection Office (DNDO) develops and coordinates the global nuclear detection architecture (GNDA). Many Federal departments participate in implementing it. Even within DHS, many DHS components participate,

Given the involvement of multiple agencies, how does DNDO achieve its statutory mission of implementing the domestic portion of the GNDA?

Question 2. What authorities does DNDO have to ensure participation by other DHS components?

Are these sufficient? If not, how are DHS components held accountable to the deadlines presented in the DHS GNDA implementation plan?

Question 3. Who leads GNDA strategy development and implementation for the Federal Government?

How is the performance of programs, agencies, and departments participating in the GNDA assessed, and what mechanisms are in place to identify duplication, overlap, or synergy among the GNDA programs and activities?

Answer. DNDO achieves its statutory mission of implementing the domestic component of the GNDA through its procurement of equipment on behalf of its DHS

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*Information is retained in committee files.

partners, fostering the nuclear and radiological detection capabilities of State and local law enforcement, and close collaboration with interagency partners.

DNDO's authorities provided by the Security and Accountability for Every (SAFE) Port Act of 2006 (Pub. L. 109–347) and the Implementing Recommendations of the 9/11 Commission Act of 2007 (Pub. L. 110–53) have led to a cooperative working relationship with interagency and intra-DHS partners. DNDO has led the development of an interagency GNDA Strategic Plan, a DHS GNDA Implementation Plan, and the joint annual review of the GNDA. The joint annual review enables a careful comparison of the respective roles that individual constituents play. A recommendations section is intended in part to correct any duplication, overlap, or lack of synergy that is identified. Improved mechanisms for assessment are being explored as part of the annual reporting process.

These accomplishments and activities have served to advance the implementation of the domestic portion of the GNDA, and further cooperative work within DHS is being undertaken to track the activities and performance measures found in the DHS GNDA Implementation Plan.

While DNDO has led the GNDA strategy development for the Federal Government, we are cognizant of the extensive expertise and efforts on behalf of the GNDA by its interagency partners. For this reason, products such as the GNDA Strategic Plan and GNDA Joint Annual Interagency Review were developed collaboratively and work continues to further empower interagency partners in shaping strategy.

In addition, coordination mechanisms such as the GNDA Sub-Interagency Policy Committee (IPC) process run by the National Security Staff within the White House and the Nuclear Terrorism Working Group (NTWG) within DHS enable identification of potential duplication and overlap, as well as synergy among programs.

Question 4a. There have been many Congressionally-requested GAO and National Academy of Sciences reports that have identified the failures in the use, testing, evaluation, procurement, and deployment of the ASP, and finally the Department has terminated the program. How do you intend to move forward with the remaining ASP's and how much money do you anticipate spending on the existing devices that are not certified by the Secretary?

What steps has DHS undertaken to implement the lessons learned from the failed ASP procurement?

Question 4b. How have the procurement, testing, and evaluation of nuclear detection systems changed in response to Congressional oversight and GAO reports?

Answer. The remaining $6,495,591 will be used for ASP deployments, decommissioning (field validation and test sites), and stream-of-commerce spectroscopic data collection in support of requirements development for future systems. DNDO has already deployed two systems at State sites, and is planning to deploy another three systems at State sites, as well as one system to CBP at a port of entry (POE) for non-operational data collection, for a total of six systems. The remaining systems will be given to National Labs, academia, etc, or will be disposed of.

DHS has implemented numerous steps to improve its acquisition processes, including but not limited to the implementation of DHS Acquisition Management Directive 102–01 (MD 102–01). In support of MD 102–01, DNDO has implemented a Solution Development Process, including a Governance Review Board, which ensures guidance in MD 102–01 is properly met. In addition, DNDO captured and documented lessons learned from the ASP program in a Lessons Learned database that is available to program managers in DNDO and is discussed during program quarterly reviews. The aforementioned documents and several other processes have directly improved DHS procurement, testing, and evaluation of nuclear detection systems. The challenges faced by the ASP program also underscore the need for close coordination with operational partners to determine technical requirements and operational requirements in the field. MD 102–01 and DNDO's internal implementation of improved acquisition and program management facilitate close coordination between technology developers and end-users.

In response to the National Academy of Sciences Report, DNDO is expanding our developmental approach to include a more robust modeling and simulation of the environment where that equipment will be deployed for radiation detection in support of the global nuclear detection architecture. The set of possible combinations of threats, cargo, and environments (i.e., nuisance radiation signatures, shielding attenuations, and background variation) is so large and diverse that DNDO is incorporating a more thorough analytical basis for understanding the performance of its detectors systems against different configurations and in different operational environments.

In response to Congressional oversight and Government Accountability Office reports for test and evaluation of nuclear detection systems, DNDO has modified DNDO Operating Instruction 1 to increase the formality of test event planning by defining roles and responsibilities and implementing a structured Milestone Review Process with entrance and exit criteria that is reviewed by the senior management of DNDO. DNDO has also increased its use of independent verification and validation, and has developed a Test Observation Reporting System to capture any deviations from the Test Plan.

Finally, DNDO has improved its test capabilities through the manufacture and acquisition of specially-designed sources and ancillary test support equipment to ensure accurate and reproducible test conditions.

Question 5a. In 2009, Secretary Napolitano testified that "in order to implement the 100% scanning requirement of foreign ship cargo entering the United States by the 2012 deadline, DHS would need significant resources for greater manpower and technology, technologies that do not currently exist, and the redesign of many ports. These are all prohibitive challenges that will require the Department to seek the time extensions authorized by law."

What efforts has DHS undertaken since that time to overcome these challenges? How successful have those efforts been?

Answer. U.S. Customs and Border Protection (CBP) has focused substantial attention and resources over the last several years on securing goods being transported within maritime containers. As a result, we have strengthened our multi-layered security measures, more effectively securing and facilitating the large volume of goods arriving in the United States each year. By leveraging programs such as the Container Security Initiative (CSI) for the integrated scanning of high-risk containers, the Customs-Trade Partnership Against Terrorism (C–TPAT), and the Importer Security Filing (often called "10+2") for the advance collection of manifest and import data to enhance targeting, we are more secure than ever before. Our layered and risk-based approach provides that, at a minimum, 100 percent of high-risk containers are examined through a number of measures, including screening, scanning, physical inspection, or resolution by foreign authorities. In addition, we have strengthened our automated targeting systems and enhanced the quality and timeliness of the commercial data upon which those systems rely. CBP continues to work collaboratively with industry, our Federal partners, and the international community to expand these programs and our capability to detect, analyze, and report on nuclear and radiological materials that are outside of regulatory control.

Question 5b. Clearly DHS has planned for some time to extend the July 2012 deadline. The law permits additional extensions in 2-year increments.

Question 5c. Does DHS expect to extend the deadline again in 2014? If so, when does DHS expect to be able to meet the 100% scanning requirement?

Answer. DHS has not made any decision at this time regarding a decision to extend the deadline in 2014. DHS will continue to work with Congress to refine its approach and ensure that scanning remains a key layer of the suite of security systems.

Question 5d. In allowing for extensions of the 100% scanning deadline, the law requires the Secretary to certify that at least two of six specified conditions exist. A lack of resources for implementing the requirement is not one of the six specified conditions.

Which of the six conditions currently exist?

Answer. On May 2, 2012 DHS Secretary Napolitano certified that the following conditions existed to allow for the extension:

- Use of systems that are available to scan containers will have a significant and negative impact on trade capacity and the flow of cargo.
- Systems to scan containers cannot be purchased, deployed, or operated at ports overseas because ports do not have the physical characteristics to install such a system.

Question 5e. Which of the six conditions does DHS expect to resolve within the next 2 years?

Answer. It is unclear which conditions can be resolved in the next 2 years due to a variety of challenges and the uniqueness of each foreign port and the cooperation with foreign governments. However, DHS recognizes the need to proceed with container security programs in a responsible, practical manner that maximizes the security of maritime cargo, facilitates trade, and enhances global supply chain resilience. DHS plans to work within and across the U.S. Government to effectively develop technology, enhance risk management processes, and implement a robust layered enforcement strategy for screening cargo. Through the Department's Science and Technology Directorate and Domestic Nuclear Detection Office, DHS continues to monitor technology advancement in the private sector, academia, and the interagency to address the challenges of scanning maritime cargo. Through existing and new efforts on domestic and international fronts, DHS—along with the World Customs Organization, the International Maritime Organization, the International Civil

Aviation Organization, and other partners—is striving to improve the security of operations, raise international standards, and foster systems that secure the global supply chain.

Question 5f. Considering that resource availability is not an allowable reason for extending the deadline, how does DHS prioritize funding for this effort relative to other programs?

Answer. To date, CBP and the Department of Energy have spent approximately $120 million on efforts to implement the 100 percent scanning mandate. The Government Accountability Office has testified that the total cost to fully implement the 100 percent scanning mandate in all ports that ship maritime cargo to the United States would be approximately $20 billion.

The International Cargo Screening (ICS) PPA prioritizes funding for CBP to continue operations for the Container Security Initiative (CSI) in keeping with DHS policy of a robust risk-based approach to cargo security. CSI is a key component to DHS's layered security approach to cargo security. The ICS PPA also allows for sufficient funding for the Secure Freight Initiative (SFI) to continue 100 percent scanning operations in Qasim, Pakistan.

Funding continues to be a priority for other key components of DHS's layered security strategy such as Customs-Trade Partnership Against Terrorism, the Importer Security Filing, and enhancements to the Automated Targeting System. These programs, in conjunction with CSI and SFI, comprise DHS's layered security strategy.

QUESTION FROM RANKING MEMBER YVETTE D. CLARKE FOR VAYL S. OXFORD

Question. What work is PNNL currently doing that might improve the performance of existing RPMs? How would you characterize the importance and potential of that work?

Answer. PNNL is engaged in several programs that are focused on improving the performance of radiation portal monitors (RPMs) as well as extending RPM life in the field.

The performance of an RPM is dictated by its ability to simultaneously detect the threat (probability of detection) and to be insensitive to nuisance and false alarms. These sensor attributes are measured as the probability of detection (PD) and the nuisance and false alarm probability (NFAP). PNNL is currently funded to develop and evaluate a number of new algorithmic approaches that have the potential to improve both of these parameters of performance for current generation RPMs. This research is focused on making full use of all the information generated by current generation RPM technology and applying our experience and knowledge from 10 years of deployment support and approximately 750 million screening events. These projects specifically address optimization of the currently deployed commercial algorithm to make best use of fielded capabilities, the evaluation of a novel algorithmic approach that categorizes screening events (radiation spectra) as "threats" or "benign," and an algorithm that accounts for the changing radiation environments in real-world operations. Combined, these efforts will likely make modest improvements in the probability of threat detection, but offer the potential to have significant operational impact through the reduction of nuisance and false alarms, which drive the operational cost for these systems.

In addition to improving the detection performance of the systems, PNNL has focused on addressing the system life-cycle issues that reduce performance of RPM systems over time and require the ultimate replacement of components and whole systems. Specifically, the radiation-sensitive detector material poly-vinyl toluene (PVT), which is the backbone of almost all deployed RPM systems worldwide, has a limited life that is not well understood. This research has focused on understanding the reasons for the degradation of PVT over time and to get at root cause so that mitigation strategies can be put in place. As the Nation's deployed systems age, this will become a critical issue. There are other limited-lifetime components of the deployed systems, and PNNL has been asked to evaluate the issue to inform a United States Government strategy to sustain the existing deployed system network to the degree that it continues to meet the operational needs of the nuclear threat detection community.