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Thank you Chairman Stupak, Ranking Member Whitfield and other distinguished members of the Subcommittee. Today I will be discussing the Department of Energy's National Nuclear Security Administration (NNSA) role in the interagency effort to prevent a nuclear terrorist attack against this country. More specifically, I will focus on the role of my office, the Office of International Material Protection and Cooperation, as a part of this larger, coordinated effort.

Before I start the technical part of my testimony concerning radiation detection monitors, I would like to provide a short background on the overall mission of my office. I believe this will demonstrate the history and expertise that DOE brings to bear on the subject of the hearing today. Detection of dangerous radioactive materials is at the heart of our mission and over the last 15 years we have worked with technical experts to successfully deploy more than 1500 radiation portal monitors (RPMs) at over 300 facilities and border crossings within over 25 countries.

Secure at the Source

The first goal of my office is to secure nuclear weapons and weapons-useable nuclear materials by upgrading security at vulnerable nuclear sites in the Russian Federation and other countries of greatest concern to the U.S. national security. By working to secure nuclear materials and weapons at the point of origin, we continue to make important strides toward denying terrorists and states of concern access to nuclear weapons and the essential element of a nuclear weapon: the fissile material. We are working at 125 nuclear sites and have secured hundreds of actual nuclear weapons and enough nuclear material for thousands of additional warheads. We have completed security upgrades at 160 buildings containing weapons useable material, more than 75% of the Russian nuclear warhead sites of concern, including 39 Russian Navy nuclear sites, and 15 Russian Strategic Rocket Sites. Work is underway at the balance of sites and is on track to be completed by the end of 2008.

Second Line of Defense

The second goal of my office is to prevent smuggling of nuclear and radiological material at international seaports, airports and land border crossings. The Second Line of Defense

program, referred to as SLD, was started in 1998 and is dedicated to this important effort. The SLD program is composed of two equally important offices: the Core Program and the Megaports Initiative. The Core Program focuses on securing border crossings, airports, and feeder seaports in Russia and other former Soviet States, Eastern Europe, Central Asia, and other key countries around the world. Under the Core program, approximately 450 sites have been identified to receive detection equipment. In Russia alone we have already equipped over 100 of these sites. Under our Megaports Initiative, we work closely with the Department of Homeland Security's Customs and Border Protection (CBP) and with the host governments to equip major international seaports with radiation detection equipment to screen cargo containers for nuclear and other radiological materials. We have identified approximately 75 seaports of interest to us for implementation and are currently at various stages of engagement with approximately 40 countries in this regard.

DOE/NNSA's SLD Program is also playing a key role in implementing the Secure Freight Initiative (SFI), a joint DHS-DOE and DOS effort started last December. This is an unprecedented effort to build upon existing port security measures by enhancing the U.S. government's ability to scan containers overseas for nuclear and radiological materials using both radiation detection equipment and non-intrusive imaging equipment to assess the risk of inbound containers. Under SFI, DHS is providing non-intrusive imaging systems to host governments while DOE is deploying radiation portal monitors, optical character recognition systems, and is developing and installing the communications systems necessary to integrate data from varying systems together to provide a more comprehensive set of information about U.S.-bound containers. Data on all scanned containers is provided to the host government. Data on U.S.-bound containers is segregated and provided to U.S. Customs officials on the ground that also send the information back to the National Targeting Center in Northern Virginia for incorporation into existing risk assessment systems. This effort is currently being implemented at seven foreign ports located in Pakistan, Honduras, the United Kingdom, Oman, Singapore, South Korea, and Hong Kong.

Unfortunately, we have clear evidence that the detection systems are necessary. In 2003, Georgian border guards, using U.S.-provided portal monitoring equipment at the Sadakhlo border crossing with Armenia, detected and seized approximately 173 grams of highly enriched uranium carried by an Armenian national. Also, in late 2005, a Megaports RPM picked up a small neutron signal from a scrap metal container leaving Sri Lanka bound for India. The source of the signal turned out to be an extremely small neutron source, which was found by the Indian authorities.

I hope the above information will be useful to the Subcommittee as I move forward to provide the technical information that you have requested concerning the nuclear detection equipment installed by the SLD program

SLD Integrated Detection System

To understand how the SLD system works, it is important to understand the interface between the fixed radiation portal monitors, the alarm station, and secondary inspections with hand-held detectors. The centerpiece of every installation completed under the SLD Core and Megaports Programs is the radiation portal monitor or RPM. We deploy RPMs that use plastic scintillators made of polyvinyl toluene (PVT) to detect gamma signatures and Helium 3 tubes to detect neutrons. The primary mission of the SLD Program is to detect special nuclear material (SNM), even small quantities of SNM, in particular plutonium and highly-enriched uranium -- materials that can be used to make an improvised nuclear device or that may have already been incorporated into a device. The equipment that we deploy can also detect other radioactive materials suitable for use in radiological dispersal devices, often referred to as "dirty bombs".

I would like to emphasize that the PVT-based nuclear detection technology deployed by the SLD program is proven technology, capable of operating effectively in varied, and in many instances harsh environmental conditions. This technology was developed to ensure nuclear material security at DOE weapons sites and the specific monitors that we deploy have been tested and evaluated by our National Laboratory technical experts for over three decades. Indeed, NNSA installs this same type of monitor at the foreign weapons laboratories and nuclear facilities to prevent insiders from smuggling SNM out of these facilities. Our extensive experience with these monitors ensures that we can deploy them effectively and ensure their long-term sustainability.

The RPM detects the presence of radiation and feeds alarm information to operators, typically customs agents or border guards, located in a local or central alarm station. The communications system graphs the gamma or neutron signal and helps the operators identify what type of alarm has occurred. At this point, the vehicle or pedestrian is retained and handheld equipment is used as part of a secondary inspection to identify the specific radioisotopes that caused the alarm. The handheld identification equipment that we currently deploy utilizes sodium-iodide or germanium technology and is the standard commercially available technology. Determination of the specific isotopes involved and their specific location is important because a number of common materials such as ceramic tile and kitty litter, in large quantities, may signal an alarm due to their relatively high concentration of radioisotopes. We call these "NORM" alarms, for 'naturally occurring radioactive material' alarms.

Experience has shown that effective use of the hand-held equipment is highly dependent on the skill and training of the onsite official as they try to locate the source of the alarm. Expediting proper adjudication of alarms through these secondary inspections is particularly important in high-volume locations like major seaports. It is DOE's judgment that use of Advanced Spectroscopic Portal (ASP) monitors will improve the rate and accuracy of alarm resolution in these high-volume settings.

ASP Testing

As you know, the Domestic Nuclear Detection Office at the Department of Homeland Security is leading the research and development (R&D) effort on the ASP monitors. DOE has been involved in some of the testing activities associated with the ASP program. In order to determine the effectiveness of the ASPs, we are working jointly with DNDO to ensure that the increased ability of these monitors to differentiate threats does not compromise threat detection. In support of this effort, I have asked Los Alamos National Laboratory (LANL) to work with DNDO and lead a multi-lab effort to collect data on the spectra of well-characterized, unshielded special nuclear material (i.e., threat objects) resident at LANL under carefully-controlled conditions for all of the ASPs. These data will provide supplemental information to help validate injection studies where actual threat signatures will be injected into stream of commerce data collected at operational sea ports during the ASP test campaign. This data gathering effort is planned to occur over the next few months. When it is completed, this information will be combined with stream of commerce data already collected by DHS to carry out injection studies, an effective and flexible tool to help determine the extent to which the presence of NORM material in cargo may mask the identification of SNM and thus prevent containers of concern from being sent to secondary inspection.

Finally, DOE will conduct additional performance evaluation of the ASP at LANL in FY 2008 to determine how best to take advantage of the ASP's spectral resolution in order to maximize the performance of the ASPs as secondary inspection tools in SLD deployments. Because the allowable times for secondary inspections and installation parameters vary from one site to another, the ASP configuration parameters must be optimized for the variety of operational sites. SLD will perform tests to optimize the installation parameters and ConOps for the range of deployments required.

Use of ASPs

In the near-term, DOE is purchasing a limited number of ASPs via contracts awarded by DNDO. Our plan is to deploy ASPs at some of our Megaports locations for use in secondary inspections. Under the planned SLD approach, once a PVT monitor alarms, the container will be sent to the ASP for secondary inspection. The ASP, with a much larger detector surface area, larger libraries, and better algorithms than the handheld detectors, should provide enhanced capability to effectively identify specific isotopes to aid Customs officials in determining whether a container presents an increased nuclear risk. Additionally, since the ASP monitors will be permanently installed and operated with less direct Customs officer involvement (i.e., there will be no need to move the hand-held device across the container) the ASP should provide greater consistency in secondary inspection. We anticipate that secondary inspections will be conducted more quickly, thus reducing the potential impact on port operations. If the ASPs are demonstrated to be reliable under a variety of field conditions, we would hope to deploy them to the remaining Megaports installations for secondary inspections.

In the future, based on the results of additional analysis or testing and once the pool of operational experience has been more fully developed, DOE/NNSA may consider deployment of the ASP in some limited primary locations where extremely high amounts of NORM in the stream of commerce may make this approach necessary and cost effective. Our experience to date has not identified this as a major area of concern. Therefore, our plan is to continue to deploy PVT for primary detection and use ASPs in secondary in large, high-volume seaports.

Summary

In closing, I would like to point out that DOE and DHS are working closely together to improve our nuclear and radiological detection capabilities. We share the common objective of preventing terrorists and states of concern from obtaining and smuggling nuclear materials that can be used in acts of terrorism against our country and our allies. I want to thank the Administration and Congress for their continued support of our program.

Thank you. I would be happy to answer any questions you may have.