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# COMBATING NUCLEAR SMUGGLING

# DHS has Developed Plans for Its Global Nuclear Detection Architecture, but Challenges Remain in Deploying Equipment

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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

[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, D.C.: Oct. 17, 2002).

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 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

[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, D.C.: July 16, 2008).

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

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.

[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.

## 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 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

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

[7]GAO, *Combating Nuclear Smuggling: DHS has Developed a Strategic Plan for its Global Nuclear Detection Architecture, but Gaps Remain*, GAO-11-869T (Washington D.C.: 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 D.C.: June 30, 2010) and GAO-11-869T.

(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

[9]GAO-10-883T and GAO-11-869T.

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 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.

[10]6 U.S.C. §921 (2006).

[11]GAO-11-869T.

- *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 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

[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 Generation Radiation Detection Equipment*, GAO-07-1247T (Washington, D.C.: 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, D.C.: 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 D.C.: 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, D.C.: Sept. 15, 2010).

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.

[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 D.C.: Mar. 22, 2006).

[15]GAO-08-999T.

[16]GAO-09-257.

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 responsibilities.[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 timeframes 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,

[17]GAO-11-869T.

[18]GAO-11-869T.

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.

## GAO Contacts and Staff Acknowledgments

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