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DHS Could Strengthen Acquisitions and Development of New Technologies

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Chairman McCaul, Ranking Member Keating, and Members of the Subcommittee:

I am pleased to be here today to discuss our past work examining the Department of Homeland Security's (DHS) progress and challenges in developing and acquiring new technologies to address homeland security needs. DHS acquisition programs represent hundreds of billions of dollars in life-cycle costs and support a wide range of missions and investments including border surveillance and screening equipment, nuclear detection equipment, and technologies used to screen airline passengers and baggage for explosives, among others. Since its creation in 2003, DHS has spent billions of dollars developing and procuring technologies and other countermeasures to address various threats and to conduct its missions. Within DHS, the Science and Technology Directorate (S&T) conducts general research and development and oversees the testing and evaluation efforts of DHS components, which are responsible for developing, testing, and acquiring their own technologies. For example, the Transportation Security Administration (TSA) is responsible for securing the nation's transportation systems and, with S&T, researching, developing, and deploying technologies to, for example, screen airline passengers and their baggage. U.S. Customs and Border Protection (CBP) is responsible for implementing measures and technologies to secure the nation's borders. In recent years, we have reported that DHS has experienced challenges in managing its multibillion-dollar acquisition efforts, including implementing technologies that did not meet intended requirements and were not appropriately tested and evaluated, and has not consistently included completed analyses of costs and benefits before technologies were implemented.

My testimony today focuses on the key findings of our prior work related to DHS's efforts to acquire and deploy new technologies to address homeland security needs. Our past work has identified three key challenges: (1) developing technology program requirements, (2) conducting and completing testing and evaluation of technologies and (3) incorporating information on costs and benefits in making technology acquisition decisions. This statement will also discuss recent DHS efforts to strengthen its investment and acquisition processes.

This statement is based on reports and testimonies we issued from May 2009 through July 2011 related to DHS's efforts to manage, test, and

deploy various technology programs and selected updates conducted in July 2011 related to DHS's efforts to strengthen its investment and acquisition processes.¹ For the updates, we reviewed recent DHS efforts to strengthen its investment and acquisition processes, such as a June 2011 DHS report on the department's progress and efforts in addressing challenges identified in our biennial reports addressing high-risk management issues.² For our past work, we reviewed program schedules, planning documents, testing reports, and other acquisition documentation. For some of the programs we discuss in this testimony, we conducted site visits to a range of facilities, such as national laboratories, airports, and other locations to observe research, development, and testing efforts. We also conducted interviews with DHS component program managers and S&T officials to discuss issues related to individual programs. We conducted this work in accordance with generally accepted government auditing standards. More detailed information on the scope and methodology from our previous work can be found within each specific report.

DHS Has Experienced Challenges in Developing and Meeting Key Performance Requirements for Various Technologies

Our past work has found that program performance cannot be accurately assessed without valid baseline requirements established at the program start. Without the development, review, and approval of key acquisition documents, such as the mission need statement, agencies are at risk of having poorly defined requirements that can negatively affect program performance and contribute to increased costs.³ We have also identified technologies that DHS has deployed that have not met key performance requirements. For example, in June 2010, we reported that over half of the 15 DHS programs we reviewed awarded contracts to initiate acquisition activities without component or department approval of documents essential to planning acquisitions, setting operational requirements, and establishing acquisition program baselines.⁴ We made

¹See the related products list at the end of this statement.

²Department of Homeland Security *Integrated Strategy for High Risk Management, Implementation and Transformation*, Bi-annual Update to the Government Accountability Office, June 2011.

³The mission need statement outlines the specific functional capabilities required to accomplish DHS's mission and objectives, along with deficiencies and gaps in these capabilities.

⁴GAO, *Department of Homeland Security: Assessments of Selected Complex Acquisitions*, [GAO-10-588SP](#) (Washington, D.C.: June 30, 2010).

a number of recommendations to help address these issues as discussed below. DHS has generally agreed with these recommendations and, to varying degrees, has taken actions to address them.

In addition, our past work has found that DHS faces challenges in identifying and meeting program requirements in a number of its programs. For example:

- In July 2011, we reported that TSA revised its explosive detection system (EDS) requirements to better address current threats and plans to implement these requirements in a phased approach. However, we reported that only some of the EDSs in TSA's fleet are configured to detect explosives at the levels established in the 2005 requirements. The remaining EDSs are configured to detect explosives at 1998 levels. When TSA established the 2005 requirements, it did not have a plan with the appropriate time frames needed to deploy EDSs to meet the requirements. To help ensure that EDSs are operating most effectively, we recommended that TSA develop a plan to deploy and operate EDSs to meet the most recent requirements to ensure new and currently deployed EDSs are operated at the levels in established requirements. DHS concurred with our recommendation.⁵
- In September 2010, we reported that the Domestic Nuclear Detection Office (DNDO) was simultaneously engaged in the research and development phase while planning for the acquisition phase of its cargo advanced automated radiography system to detect certain nuclear materials in vehicles and containers at ports.⁶ DNDO pursued the deployment of the cargo advanced automated radiography system without fully understanding the physical requirements of incorporating the system in existing inspection lanes at ports of entry. We reported that this occurred because, during the first year or more of the program, DNDO and CBP had few discussions about operating

⁵GAO, *Aviation Security: TSA Has Enhanced Its Explosives Detection Requirements for Checked Baggage, but Additional Screening Actions Are Needed*, [GAO-11-740](#) (Washington, D.C.: July 11, 2011). An EDS machine uses computed tomography technology to automatically measure the physical characteristics of objects in baggage. The system automatically triggers an alarm when objects that exhibit the physical characteristics of explosives are detected.

⁶GAO, *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).

requirements for primary inspection lanes at ports of entry. DHS spent \$113 million on the program since 2005 and canceled the development phase of the program in 2007.

- In May 2010, we reported that not all of the Secure Border Initiative Network (SBI*net*) operational requirements that pertain to Block 1 were achievable, verifiable, unambiguous, and complete.⁷ For example, a November 2007 DHS assessment found problems with 19 operational requirements, which form the basis for the lower-level requirements used to design and build the system. As a result, we recommended that the Block 1 requirements, including key performance parameters, be independently validated as complete, verifiable, and affordable and any limitations found in the requirements be addressed. DHS agreed with these recommendations and CBP program officials told us that they recognized the difficulties they experienced with requirements development practices with the SBI*net* program. In January 2011, the Secretary of Homeland Security announced her decision to end the program as originally conceived because it did not meet cost-effectiveness and viability standards.⁸
- In October 2009, we reported that TSA passenger screening checkpoint technologies were delayed because TSA had not consistently communicated clear requirements for testing the technologies.⁹ We recommended that TSA evaluate whether current

⁷GAO, *Secure Border Initiative: DHS Needs to Reconsider Its Proposed Investment in Key Technology Program*, [GAO-10-340](#) (Washington, D.C.: May 5, 2010) and *Secure Border Initiative: DHS Needs to Address Testing and Performance Limitations That Place Key Technology Program at Risk*, [GAO-10-158](#) (Washington, D.C.: Jan. 29, 2010). SBI*net* Block 1 is a surveillance, command, control, communications, and intelligence system fielded in parts of Arizona that is intended to mitigate or eliminate vulnerabilities along the international border between ports of entry. Block 1 is an element of DHS's Secure Border Initiative, a comprehensive, multiyear plan to secure the borders of the United States and reduce illegal cross border activities such as smuggling of economic migrants, illegal drugs, and people with terrorist intent.

⁸GAO, *Border Security: Preliminary Observations on the Status of Key Southwest Border Technology Programs*, [GAO-11-448T](#) (Washington D.C.: Mar. 15, 2011). After an internal assessment initiated in January 2010, the Secretary of Homeland Security announced in January 2011 that she had directed CBP to end the SBI*net* program as originally conceived. According to DHS, the Secretary's decision was informed by an independent analysis of cost-effectiveness, a series of operational tests and evaluations, and Border Patrol input.

⁹GAO, *Aviation Security: DHS and TSA Have Researched, Developed, and Begun Deploying Passenger Checkpoint Screening Technologies, but Continue to Face Challenges*, [GAO-10-128](#) (Washington, D.C.: Oct. 7, 2009).

passenger screening procedures should be revised to require the use of appropriate screening procedures until TSA determined that existing emerging technologies meet its functional requirements in an operational environment. TSA agreed with this recommendation and reported taking actions to address it.

DHS Has Encountered Challenges in Conducting and Completing Testing and Evaluation

Our prior work has also identified that failure to resolve problems discovered during testing can sometimes lead to costly redesign and rework at a later date and that addressing such problems during the testing and evaluation phase before moving to the acquisition phase can help agencies avoid future cost overruns. Specifically:

- In March 2011, we reported that the independent testing and evaluation of SBInet's Block 1 capability to determine its operational effectiveness and suitability was not complete at the time DHS reached its decision regarding the future of SBInet or requested fiscal year 2012 funding to deploy the new Alternative (Southwest) Border Technology.¹⁰ We reported that because the Alternative (Southwest) Border Technology incorporates a mix of technology, including an Integrated Fixed Tower surveillance system similar to that currently used in SBInet, the testing and evaluation could have informed DHS's decision about moving forward with the new technology deployment.
- In September 2010, we reported that S&T's plans for conducting operational testing of container security technologies did not reflect all of the operational scenarios that CBP was considering for implementation.¹¹ We reported that until the container security technologies are tested and evaluated consistent with all of the operational scenarios, S&T cannot provide reasonable assurance that the technologies will function as intended. For example, S&T did not include certain scenarios necessary to test how a cargo container would be transported throughout the maritime supply chain. We recommended that DHS test and evaluate the container security technologies consistent with all the operational scenarios DHS identified for potential implementation. DHS concurred with our recommendation.

¹⁰[GAO-11-448T](#).

¹¹GAO, *Supply Chain Security: DHS Should Test and Evaluate Container Security Technologies Consistent with All Identified Operational Scenarios to Ensure the Technologies Will Function as Intended*, [GAO-10-887](#) (Washington D.C.: Sept. 29, 2010).

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- In October 2009, we reported that TSA deployed explosives trace portals, a technology for detecting traces of explosives on passengers at airport checkpoints, even though TSA officials were aware that tests conducted during 2004 and 2005 on earlier models of the portals suggested the portals did not demonstrate reliable performance in an airport environment.¹² TSA also lacked assurance that the portals would meet functional requirements in airports within estimated costs and the machines were more expensive to install and maintain than expected. In June 2006, TSA halted deployment of the explosives trace portals because of performance problems and high installation costs. We recommended that to the extent feasible, TSA ensure that tests are completed before deploying checkpoint screening technologies to airports. DHS concurred with the recommendation and has taken action to address it, such as requiring more-recent technologies to complete both laboratory and operational tests prior to deployment.

DHS Has Not Consistently Incorporated Information on Costs and Benefits in Making Acquisition Decisions

Our prior work has shown that cost-benefit analyses help congressional and agency decision makers assess and prioritize resource investments and consider potentially more cost-effective alternatives and that without this ability, agencies are at risk of experiencing cost overruns, missed deadlines, and performance shortfalls. For example, we have reported that DHS has not consistently included these analyses in its acquisition decision making. Specifically:

- In March 2011, we reported that the decision by the Secretary of Homeland Security to end the *SBI_{net}* program was informed by, among other things, an independent analysis of cost-effectiveness.¹³ However, it was not clear how DHS used the results to determine the appropriate technology plans and budget decisions, especially since the results of *SBI_{net}*'s operational effectiveness were not complete at the time of the Secretary's decision to end the program. Furthermore, the cost analysis was limited in scope and did not consider all technology solutions because of the need to complete the first phase of the analysis in 6 weeks. It also did not assess the technology approaches based on the incremental effectiveness provided above the baseline technology assets in the geographic areas evaluated. As

¹²[GAO-10-128](#).

¹³[GAO-11-448T](#).

we reported, for a program of this importance and cost, the process used to assess and select technology needs to be more robust.

- In October 2009, we reported that TSA had not yet completed a cost-benefit analysis to prioritize and fund its technology investments for screening passengers at airport checkpoints.¹⁴ One reason that TSA had difficulty developing a cost-benefit analysis was that it had not yet developed life-cycle cost estimates for its various screening technologies. We reported that this information was important because it would help decision makers determine, given the cost of various technologies, which technology provided the greatest mitigation of risk for the resources that were available. We recommended that TSA develop a cost-benefit analysis. TSA agreed with this recommendation and has completed a life-cycle cost estimate and collected information for its checkpoint technologies, but has not yet completed a cost-benefit analysis.
- In June 2009, we reported that DHS's cost analysis of the Advanced Spectroscopic Portal (ASP) program did not provide a sound analytical basis for DHS's decision to deploy the portals.¹⁵ We also reported that an updated cost-benefit analysis might show that DNDO's plan to replace existing equipment with advanced spectroscopic portals was not justified, particularly given the marginal improvement in detection of certain nuclear materials required of advanced spectroscopic portals and the potential to improve the current-generation portal monitors' sensitivity to nuclear materials, most likely at a lower cost.¹⁶ At that time, DNDO officials stated that they planned to update the cost-benefit analysis. After spending more than \$200 million on the program, in February 2010 DHS announced that it was scaling back its plans for development and use of the portals technology.

¹⁴[GAO-10-128](#).

¹⁵GAO, *Combating Nuclear Smuggling: Lessons Learned from DHS Testing of Advanced Radiation Detection Portal Monitors*, [GAO-09-804T](#) (Washington, D.C.: June 25, 2009). The ASP program is an effort by DHS to develop, procure, and deploy a successor to existing radiation detection portals. Radiation detection portals, also known as radiation portal monitors, are designed to detect the emission of radiation from objects that pass by them. The current portals are generally deployed at the U.S. land and sea borders by DHS's DNDO and operated by DHS's CBP.

¹⁶GAO-09-804T

DHS Has Efforts Under Way to Strengthen Acquisition and Technology Development

Since DHS's inception in 2003, we have designated implementing and transforming DHS as high risk because DHS had to transform 22 agencies—several with major management challenges—into one department. This high-risk area includes challenges in strengthening DHS's management functions, including acquisitions; the impact of those challenges on DHS's mission implementation; and challenges in integrating management functions within and across the department and its components. Failure to effectively address DHS's management and mission risks could have serious consequences for U.S. national and economic security.¹⁷

In part because of the problems we have highlighted in DHS's acquisition process, implementing and transforming DHS has remained on our high-risk list. DHS currently has several plans and efforts underway to address the high-risk designation as well as the more specific challenges related to acquisition and program implementation that we have previously identified.

In June 2011, DHS reported to us that it is taking steps to strengthen its investment and acquisition management processes across the department by implementing a decision-making process at critical phases throughout the investment life cycle. For example, DHS reported that it plans to establish a new model for managing departmentwide investments across their life cycles. Under this plan, S&T would be involved in each phase of the investment life cycle and participate in new councils and boards DHS is planning to create to help ensure that test and evaluation methods are appropriately considered as part of DHS's overall research and development investment strategies. In addition, DHS reported that the new councils and boards it is planning to establish to strengthen management of the department's acquisition and investment review process would be responsible for, among other things, making decisions on research and development initiatives based on factors such as viability and affordability and overseeing key acquisition decisions for major programs using baseline and actual data. According to DHS, S&T will help ensure that new technologies are properly scoped, developed, and tested before being implemented. DHS also reports that it is working with components to improve the quality and accuracy of cost estimates and has increased its staff during fiscal year 2011 to develop independent

¹⁷GAO, *High Risk Series: An Update*, [GAO-11-278](#) (Washington, D.C.: February 2011).

cost estimates, a GAO best practice, to ensure the accuracy and credibility of program costs. DHS reports that four cost estimates for level 1 programs have been validated to date.

The actions DHS reports taking or has under way to address the management of its acquisitions and the development of new technologies are positive steps and, if implemented effectively, could help the department address many of these challenges. However, showing demonstrable progress in implementing these plans is key. In the past, DHS has not effectively implemented its acquisition policies, in part because it lacked the oversight capacity necessary to manage its growing portfolio of major acquisition programs. Since DHS has only recently initiated these actions, it is too early to fully assess their impact on the challenges that we have identified in our past work. Going forward, we believe DHS will need to demonstrate measurable, sustainable progress in effectively implementing these actions.

Chairman McCaul, Ranking Member Keating, and Members of the Subcommittee, this concludes my prepared statement. I would be pleased to respond to any questions that you or other members of the subcommittee may have.

GAO Contact and Staff Acknowledgements

For questions about this statement, please contact David C. Maurer at (202) 512-9627 or maurerd@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this statement. Individuals making key contributions to this statement include Chris Currie, Assistant Director; Bintou Njie; and Michael Kniss. John Hutton; Katherine Trimble; Nate Tranquilli; and Richard Hung also made contributions to this statement. Key contributors for the previous work that this testimony is based on are listed within each individual product.

Related GAO Products

Aviation Security: TSA Has Enhanced Its Explosives Detection Requirements for Checked Baggage, but Additional Screening Actions Are Needed. [GAO-11-740](#). (Washington, D.C.: July 11, 2011).

Homeland Security: Improvements in Managing Research and Development Could Help Reduce Inefficiencies and Costs. [GAO-11-464T](#). (Washington D.C.: March. 15, 2011).

Border Security: Preliminary Observations on the Status of Key Southwest Border Technology Programs. [GAO-11-448T](#). (Washington D.C.: March 15, 2011).

High-Risk Series: An Update. [GAO-11-278](#). (Washington D.C.: February 16, 2011).

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.: September 15, 2010).

Supply Chain Security: DHS Should Test and Evaluate Container Security Technologies Consistent with All Identified Operational Scenarios To Ensure the Technologies Will Function as Intended. [GAO-10-887](#). (Washington D.C.: September 29, 2010).

Department of Homeland Security: Assessments of Selected Complex Acquisitions. [GAO-10-588SP](#). (Washington, D.C.: June 30, 2010).

Secure Border Initiative, DHS Needs to Reconsider Its Proposed Investment in Key Technology Program. [GAO-10-340](#). (Washington, D.C.: May 5, 2010).

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