U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE AND TECHNOLOGY
SUBCOMMITTEE ON TECHNOLOGY AND INNOVATION

HEARING CHARTER

Passenger Screening R&D: Responding to President Obama's Call to Develop and Deploy the Next Generation of Screening Technologies

Wednesday, February 3, 2010
2:00 – 3:00 p.m.
2318 Rayburn House Office Building

1. Purpose

On Wednesday, February 3, 2010, the Subcommittee on Technology and Innovation will hold a hearing to review the airline passenger screening-related research, development, testing, and deployment activities of the Department of Homeland Security Science and Technology Directorate, the DHS University Centers of Excellence, the National Institute of Standards and Technology, and the Department of Energy National Laboratories.

2. Witnesses

Mr. Brad Buswell is the Deputy Undersecretary of the Science and Technology Directorate at the Department of Homeland Security.

Dr. Penrose Albright is the Principal Associate Director for Global Security at the Lawrence Livermore National Laboratory.

Dr. Bert Coursey is the Program Manager of the Coordinated National Security Standards Program at the National Institute of Standards and Technology.

Dr. Sandra Hyland is a Senior Principal Engineer at BAE Systems.

3. Brief Overview

In remarks made after the December 25th airplane bombing attempt, President Obama called for a review of the current screening systems and an expansion of the development of new technologies, stating:

> "…we need to protect our airports -- more baggage screening, more passenger screening and more advanced explosive detection capabilities, including those that can improve our ability to detect the kind of explosive used on Christmas. … And today, I'm directing that the Department of Homeland Security take additional steps, including: …working aggressively, in cooperation with the

Department of Energy and our National Labs, to develop and deploy the next generation of screening technologies."

The hearing will focus on the advancement of new passenger screening technologies, testing methods used to evaluate screening machines, and issues encountered during deployment of new screening systems.

4. Background

The Transportation Security Administration (TSA) was created in 2001 to act as a centralized federal authority to manage transportation security efforts in the United States. Moved to the Department of Homeland Security in 2006, TSA oversees security for highways, railroads, buses, mass transit systems, pipelines, ports and airports. The majority of TSA's work is in airport security, heading up screening efforts for passengers, checked luggage, and commercial cargo.

The Transportation Security Laboratory (TSL) became part of the Department of Homeland Security Science and Technology Directorate (DHS S&T) in 2006 and provides support for TSA's mission through research, technology development, testing and evaluation, and technical support for deployed technologies. The bulk of TSL's work is the validation of explosive detection systems for passengers, luggage, and cargo. TSL tests explosive detection systems submitted by private industry vendors against specifications provided by TSA. Once systems pass the validation phase, they are placed on the Qualified Products List, indicating their efficacy and deployment readiness. In addition to TSL's validation activities, DHS S&T conducts research in imaging, particle physics, chemistry, material science, and advanced algorithms to develop enhanced explosive detection and mitigation capabilities.

The National Explosives Engineering Sciences Security Center (NEXESS) was established by DHS S&T in 2006, combining expertise from three National Labs: Lawrence Livermore National Lab, Los Alamos National Lab, and Sandia National Lab. This center studies the performance characterization of homemade explosives (HME) and understanding vulnerability of aircraft to HME threats.

The National Institute of Standards and Technology (NIST) is a non-regulatory agency of the Department of Commerce. Founded in 1901, NIST's mission is to promote US innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life. NIST supports the passenger screening mission of DHS S&T and TSA by developing measurement methods, standards reference materials, and new measurement technologies for passenger screening systems and reference data on explosives. This underlying information is critical to the development of new technologies that can detect and identify the current and future generations of explosives in the most efficient, safe, and reliable manner.

5. Issues and Concerns

Does the current research and development portfolio of DHS S&T, its University Centers of Excellence and the National Labs adequately meet the needs of the TSA and fill existing capability gaps? How are priorities set for future research projects and do these priorities allow a balanced portfolio of basic research, applied research, and technology transition? TSA is responsible for setting research and technology priorities at TSL through the Capstone Integrated Product Team (IPT) process. There are thirteen IPTs in DHS S&T that provide input into the research plans based on their needs in the field. The Transportation Security IPT consists of representatives from agencies such as TSA, US Coast Guard, Customs and Border Patrol and US Secret Service. The IPT process is designed to meet the short-term needs of the customer and can lead to research that is improperly weighted towards flash-in-the-pan areas, such as liquid explosives. DHS S&T, its University Centers of Excellence, and the National Laboratories must coordinate a balanced research agenda that does not overly prescribe reactive research and maintains a proactive view of future passenger screening technologies.

How does TSL develop the testing metrics and methods used to evaluate passenger screening technologies? What are the criteria for success and are technologies that are tested by TSL ready for deployment? If not, what additional efforts are necessary to bring technologies to full readiness? TSL takes technology specifications from TSA and evaluates passenger screening devices submitted by manufacturers. A successful evaluation places the device on the "Qualified Products List" indicating that it is suitable for use by TSA. Although most machines are evaluated successfully, there have been recent examples of missteps, such as the Explosive Trace Portals, or "puffers." These machines use puffs of air to dislodge trace amounts of explosive material from a passenger for detection. Despite passing qualification tests, the extensive pilot study was discontinued due to maintenance issues that arose when the puffers encountered dirt and humidity common in any airport environment. TSL, TSA, and NIST must work together to ensure that testing metrics and methods not only reflect the minimum requirements for detection, safety, and usability, but can predict performance levels in a realistic environment.

Does DHS S&T adequately consider the social science impact of new technologies (e.g. passenger convenience, safety, and public acceptance due to privacy) when developing new passenger screening devices? What research is being done to develop technologies or techniques that can mitigate concerns over privacy and safety? The newest, most accurate and most efficient passenger screening devices are useless if a passenger refuses to walk through them. TSA and DHS S&T must work to understand how these technologies will affect the people being screened and develop the devices from the start that appropriately minimize these concerns. Congress has recently seen legislation that bans the use of full-body scanners due to privacy concerns. While R&D is currently being done to develop technologies and techniques that minimize privacy concerns, it is reactive in nature to a problem that should have been anticipated.