Use of Advanced Imaging Technology at Checkpoints

Homeland Security

Transportation Security Administration

Message from the Acting Deputy Administrator

May 10, 2019

I am pleased to present the following report, "Use of Advanced Imaging Technology at Checkpoints," prepared by the Transportation Security Administration (TSA).

This report was compiled pursuant to language in Senate Report 115-283, which accompanies the Fiscal Year (FY) 2019 Department of Homeland Security Appropriations Act (P.L. 116-6). The report discusses the status of current developments in Advanced Imaging Technology (AIT) airport checkpoint passenger screening systems.

Pursuant to congressional requirements, this report is being provided to the following Members of Congress:

> The Honorable Lucille Roybal-Allard
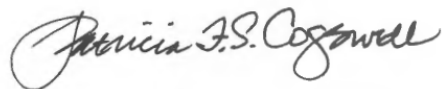> Chairwoman, House Appropriations Subcommittee on Homeland Security
>
> The Honorable Chuck Fleischmann
> Ranking Member, House Appropriations Subcommittee on Homeland Security
>
> The Honorable Shelley Moore Capito
> Chairman, Senate Appropriations Subcommittee on Homeland Security
>
> The Honorable Jon Tester
> Ranking Member, Senate Appropriations Subcommittee on Homeland Security

I appreciate your continued support of our mission. Inquiries relating to this report may be directed to me at (571) 227-2801 or to TSA's Legislative Affairs office at (571) 227-2717.

Sincerely,

Patricia F.S. Cogswell
Acting Deputy Administrator

Executive Summary

The purpose of this report is to provide Congress with the status of TSA's current development and deployment efforts for checkpoint AIT passenger screening systems.

TSA currently is working on three AIT efforts:

1. Enhancing the screening effectiveness of the currently installed systems at domestic airports;
2. Testing and demonstrating passenger screening technology that currently is used internationally; and
3. Identifying the passenger screening equipment vendors that currently are able to provide equipment that meets current threat detection standards.

Enhancing Screening Effectiveness

The enhancements to the current AIT fleet include a new threat detection algorithm that includes a higher threat detection standard that can be selected on the basis of risk, when appropriate. Other enhancements include:

- Clearly identifying to a transportation security officer (TSO) when he or she must perform a secondary search on a targeted area; and
- Allowing one TSO to continue to screen passengers while another TSO is performing a secondary search.

Once testing is complete, these enhancements will be implemented by the end of the first quarter of FY 2020.

Testing International Screening Technology

TSA is evaluating the operational impact and effectiveness of new AIT passenger screening technology, currently used internationally, through demonstration of the system at a small number of U.S. federalized airports.[1]

Identifying Equipment that Meets Current AIT Screening Standards

The prework required to identify passenger screening equipment that meets current AIT screening standards is in process. Any qualified manufacturer that would like to propose passenger screening equipment must submit the relevant documentation, data, and equipment for certification testing. TSA anticipates that certification testing of the proposed new screening equipment, and the documentation for the equipment that meets TSA standards, will be completed by the end of the second quarter of FY 2020.

---

[1] Federalized airports includes only airports where TSA operates, meaning that transportation security equipment and TSOs are in place.

Use of Advanced Imaging Technology at Checkpoints

Table of Contents

I. Legislative Language

This report is submitted pursuant to language in Senate Report 115-283, which accompanies the Fiscal Year (FY) 2019 Department of Homeland Security (DHS) Appropriations Act (P.L. 116-6), which states:

> The Committee is aware of AIT in use internationally since 2015. TSA is directed to report, not later than 90 days after the date of enactment of this act, on the suitability of this technology for use in U.S. airports and on any plans to test and evaluate the technology, which shall include a timeline toward qualification for procurement.

II. Background

Advanced Imaging Technology (AIT) uses millimeter wave technology to locate anomalies on a passenger's divested body using transmitters that generate millimeter wave electromagnetic energy. This low electromagnetic energy penetrates clothing and detects threats carried on the human body, but bounces off the body. The wave energy then is collected by signal receivers and is used to generate an image.

AIT includes a processor that evaluates the image using targeted algorithms to locate suspected threats. AIT anomalies are displayed on a human form avatar to assist with transportation security officer (TSO) resolution protocols.

The Transportation Security Administration (TSA) deployed the first generation of AIT units (AIT-1) in January 2008. AIT-1 units were upgraded to improve threat detection capability beginning in August 2010, known as AIT-1 Tier II. In April 2015, second-generation AIT units (AIT-2) were deployed to federalized U.S. airports.[2] Full operating capability was achieved in September 2017 with 962 units in use nationwide.

---

[2] Federalized airports includes only airports where TSA operates, meaning that transportation security equipment and TSOs are in place.

III. Current Passenger Screening Enhancement Initiatives

Enhancing the Deployed AIT Fleet

AIT continues to be a key component of passenger screening and is suitable for use in federalized U.S. airports. As the persistent and dynamic threat to aviation security continues, TSA actively is developing enhanced detection capabilities through the use of advanced threat detection algorithm software. The Targeted Threat Algorithm, in combination with a series of operator tools, provides a focused threat detection capability while improving throughput and passenger experience. These enhancements include:

- Selectable threat detection algorithms to support risk-based screening;
- Clearly identifying to TSOs when to do a secondary search on a targeted area; and
- Allowing one TSO to continue to screen passengers while another performs a secondary search.

Once testing is complete, these enhancements are scheduled to begin implementation across TSA's current fleet in the first quarter of FY 2020.

International Screening Technology Evaluation

In FY 2016, the TSA Innovation Task Force partnered with the vendor of an internationally deployed AIT system to assess its technology in TSA operations as part of a demonstration. To facilitate this demonstration, the DHS Science and Technology Directorate's Transportation Security Lab (TSL) certified this technology at the TSA detection standard of AIT-1 Tier II. With the certification, TSA procured and deployed a small quantity of these systems for installation at U.S. airports to assess the feasibility and impact of the distinctive components of this technology. TSA is assessing the impact of this equipment on security effectiveness, operational efficiency, and passenger experience. The results are informing future requirements development.

DHS TSL continues to perform certification testing of new equipment at the AIT-2 Tier II standard, which is the standard AIT equipment that currently is deployed. The demonstration equipment may provide an opportunity for TSA to have two vendors capable of meeting the AIT-2 Tier II standard, which is the highest level of detection currently used in the fielded fleet. Testing is also in process to determine if this new system is able to perform at levels higher than our current AIT-2 detection standard. This would pave the way for TSA to begin the approval process required to procure and field newer technology.

Identification of New TSA Certification-Tested AIT Equipment

TSA is interested in improving the performance of the AIT screening equipment, and has begun the process of identifying manufacturers of screening equipment with the potential to meet, or

exceed, the minimum screening certification standards. Manufacturers will be allowed to propose their equipment for testing and evaluation. To meet TSA's standards:

1. Proposed screening equipment must pass TSA's precertification process.
2. Precertified equipment then may be submitted to the DHS TSL for certification testing. Certification testing is designed to ensure that the equipment meets minimum screening performance standards in an airport environment.
3. Equipment that passes DHS TSL certification testing is eligible to be submitted to the TSA Systems Integration Facility (TSIF) for user/functional testing.
4. Equipment that passes TSIF testing may be submitted for operational testing at federalized airports.

Screening equipment that passes all of these tests meets TSA's operational, functional, and technical requirements. By the end of the second quarter of FY 2020, TSA expects to identify the equipment that meets these standards.

IV. Conclusion

AIT remains a key component of passenger screening in U.S. airports. To address persistent and dynamic aviation threats, AIT is undergoing development efforts to enhance detection capabilities through advances in threat detection algorithm software. Additionally, TSA is testing and demonstrating new passenger screening technology, including technology that currently is used internationally, to identify new products that meet or exceed TSA's requirements. These outreach, testing, and demonstration activities will identify products and vendors that are able to address checkpoint AIT passenger screening requirements.