Checked Baggage Program

Checking baggage for explosives is critical for airliner passenger safety

Aviation security continues to be the biggest threat to homeland security. There are endless ways that explosives can be hidden in checked baggage aboard aircraft-–in toys, computers, food, shoes, even flashlights and medical devices. The Department of Homeland Security Science and Technology Directorate (S&T) is working on automated high-speed, high-performance checked baggage explosives detection systems (EDS) with improved throughput and reduced operations and maintenance costs for acquisition by the Transportation Security Administration (TSA).

S&T is also assisting TSA to develop performance requirements and standards as well as core technologies for next-generation EDS. This process builds on itself and progressively upgrades the ability to detect explosives in all situations.

The commercial development of these next-generation systems will substantially improve the performance and affordability of checked baggage screening. The following sections describe some of the projects with the Checked Baggage program and indicate some of the successes the program has realized to date.

S&T delivers a standard for the user interface of screening equipment

S&T delivered versions 1 and 2 of the Digital Imaging and Communications in Security (DICOS) industry standard for checked baggage as well as for carry-on luggage screening to TSA. DICOS will enable and require security screening components and systems to use standard interfaces for images and data (the video monitors and equipment control systems screeners will use).

S&T develops simulated explosives for realistic testing of screening equipment and procedures

S&T developed the explosives methods associated with TSA homemade explosives detection initiative. This included the science and procedural safety to build simulant explosives for vendor characterization and data collection. Refined algorithmic approaches and test and evaluation resulted in TSA qualification of new threat materials detection capability.

Collaborating with academia to develop measurement and advanced analysis

S&T is working with a consortia of universities including, Duke University, Massachusetts Institute of Technology, Washington University of St Louis and Stanford University to develop new X-ray signature measurement techniques as well as advanced approaches to data analysis and algorithms. These methods will be applied to X-ray conceptual prototypes and as information theoretic foundations for advanced system concepts starting in fiscal year 2015.

Checked baggage screening systems.

E-BEAM imaging prototype demonstration will improve detection of sheet-type explosives

The recently completed L-3 E-beam effort supported the development and testing of a high speed, 5th generation computed tomography prototype. This prototype system was completed in 2012 and has been shown to have imaging characteristics that will significantly improve the detection of sheet type explosives.

S&T customers/partners

TSA is the primary customer for the Checked Baggage program.

Homeland Security
Science and Technology

For more information about the Checked Baggage Program, email sandt.explosives@dhs.gov.

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