DHS Science and Technology Directorate

Air Cargo Program

Approximately 12 million pounds of cargo are transported daily on domestic passenger aircraft

Since the 9/11 Commission Act of 2007, the Transportation Security Administration (TSA) must ensure that 100 percent of cargo on all passenger flights in the United States is screened. To assist, the Department of Homeland Security, Science and Technology Directorate (S&T) is characterizing the air cargo environment (cargo, contamination and facilities), assessing new and modified screening systems, and developing new and advanced screening and detection tools and technologies. New technologies must screen more effectively without impacting the efficient flow of air cargo.

Assuring air cargo safety through the detection and screening systems

S&T develops and tests screening systems and operator training and decision support tools for the detection of explosives components and improvised explosive devices in air cargo.

S&T is developing portable Mass Spectrometer Explosives Trace Detection systems to more effectively detect homemade explosives (HMEs) that were tested in fiscal year (FY) 2013. S&T is developing Palletized Cargo Screening Systems to screen low- and medium-density pallets of air cargo more efficiently, with testing in early FY2014.

S&T is also looking to reduce false alarms by conducting trace source alarm analysis and developing explosive trace detection algorithm modifications.

S&T program accomplishments to date

S&T transitioned a definitive "Background Chemical Security" study to TSA. The study identified levels of key constituents of HMEs present in the background air cargo environment, and assessed their impact on explosive trace detection systems to develop better algorithms used for screening.

S&T developed training and decision support tools to help screeners make the right assessments in the course of their critical work, delivering a Train-the-Trainer Package, Break-Bulk and Palletized Cargo Image Based Qualification Tests, a Cargo Screener Selection Test Battery, a Palletized Cargo Images Database, and a Palletized Cargo Training Package.

S&T regularly conducts developmental and independent testing and evaluation, leading to the qualification of numerous systems. This ongoing effort supports updates to the TSA Air Cargo Screening Technology List, which identifies grandfathered, approved, and qualified systems.

New projects in the air cargo program

Opacity and Complexity Assessment Software Tool (OCAST) – S&T is refining OCAST for air cargo operations. OCAST objectively assesses the complexity of an X-ray image to determine whether it is reasonable for an operator to assess the image for the presence of explosives.

Payoff: Integrated software tool with X-ray screening systems for improved operator performance. OCAST could have wide applicability to other X-ray screening systems.

Image Review Procedures – S&T is conducting a pilot, collecting lessons learned, and updating X-ray procedures.

Payoff: Improved primary screening and increased air cargo throughput by sending fewer parcels for secondary screening.

Customers and partners

S&T is working with TSA, independent air cargo carriers and participants in TSA's Certified Cargo Screening Program to enhance air cargo screening technologies.

Homeland Security

Science and Technology

To learn more about the Air Cargo program, email sandt.explosives@dhs.gov.

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