Explosives Trace Detection and Screening

Explosive threats are a major concern in aviation security and across the Homeland Security Enterprise. Explosives Trace Detectors (known as ETDs) are deployed as a secondary screening method for explosives detection by multiple DHS components such as the TSA, USSS, CBP and the USCG as well as independent air cargo screening facilities. ETDs detect traces or residues of explosives left on surfaces such as a hand or a piece of luggage. The wide variety of operational environments of DHS components is challenging and must be taken into consideration when developing new explosives trace detection equipment.

New and improved trace explosives detection capabilities are needed due to the increasing variety of explosive threats such as homemade explosives and tactics used to evade detection. Specifically, DHS components need ETDs with upgradable threat libraries and enhanced sampling technologies for effective detection.

To address these needs, this program has near term and long term efforts. For near term efforts, the program focuses on retrofitting and enhancing capabilities of current ETDs. For long term efforts, the program develops Next Generation ETDs with upgradable threat libraries and improved contact and non-contact sampling capabilities while maintaining ease of use and keeping operational costs low. A supporting sciences effort provides foundational research to answer fundamental questions in trace explosives detection that benefit the entire research & development community. This includes work in developing enhanced contact and non-contact sampling tools, a vapor testbed for effective test and evaluation, and detection methods for families of explosives that are challenging for current ETDs.

S&T Delivers the Next Generation of ETDs and New Sampling Tools and Methods

DHS S&T is focused on providing more capability for secondary screening of explosives. Selected tasks include:

- Developing retrofit kits to enhance detection capabilities of currently deployed ETDs. Enhanced capabilities include an upgradable threat library to detect current and emerging explosive threats

- Conducting surveys of Transportation Security Officers (TSOs) to collect operational feedback needed for developing the next generation of ETDs

- Training TSOs at major CONUS airports on better sampling methods to increase operational effectiveness

- Developing Next Generation ETDs with enhanced sampling, upgradable and expandable threat libraries, and threat identification/confirmation for both current and emerging threats

- Developing efficient non-contact explosive sampling methodologies. These sampling methodologies minimize ETD end users' guesswork, target new explosive threats, and provide more flexibility in concepts of operations

Examples of non-contact samplers currently under development by the Secondary Screening Technology Development Program and an artist's concept for their integration into a passenger checkpoint

S&T Customers/Partners

The TSA, CBP, USSS, and the USCG are customers for the Secondary Screening Technology Development Program. The program coordinates with the Transportation Security Laboratory for Developmental Testing and Evaluation as well as Subject Matter Expertise in support of projects in the program. The program also collaborates with partners such as the DHS Office of the Chief Procurement Officer for strategic sourcing, the DoD's Combating Terrorism Technical Support Office (CTTSO), and international partners such as the United Kingdom Home Office.