Fact Sheet

Explosives Detection Personnel Portals

Commercialized Version of Explosives Detection Portal with IMS Detection

Prototype Portal using Mass Spectrometry Detection

Description

The Explosives Detection Portal is a walk-through system for rapidly screening personnel for trace amounts of explosives at sites such as airports. The portal uses a Sandia-patented air flow design and air sampling technique to detect trace explosives at levels previously considered impossible to analyze. The explosives material is collected using Sandia-patented preconcentration technology and then identified using a commercial chemical detector. The original version uses a commercial ion mobility spectrometer and the latest prototype uses a commercial mass spectrometer for explosives detection. Portal research has been funded by the Federal Aviation Administration (FAA) and the Department of Energy Office of Safeguards and Security.

Features

Sandia's latest preconcentrator is 1000 times more sensitive, 200 times smaller, 13 times less costly, and 4 times faster than previously existing technology. Levels of detection achievable by the portal are measured in parts per quadrillion sensitivity. A two-stage preconcentrator collects heavy organic molecules typically found in high explosives from very large, dilute air streams. The preconcentrator draws in a large volume of air, collects heavy organic compounds from the air stream onto a filter, then vaporizes these compounds into a smaller parcel of air that is then delivered to the commercial explosives detector. Using this patented approach, Sandia has been able to sample the large volumes of air necessary to screen personnel for explosives.

Applications

The Explosives Detection Portal can be used to prevent terrorist acts and restore public confidence not only in the commercial aviation industry but also in other high-risk public facilities such as nuclear facilities, prisons, courtrooms, post offices, federal buildings, and schools.

Availability

Sandia's patented air sampling and preconcentration technologies have been licensed to Smiths Detection (formerly Barringer Instruments, Inc.), for applications in personnel portals with ion mobility spectrometry (IMS) detection. The portal prototype using mass spectrometry was tested at the FAA Technology Center and Idaho National Engineering and Environmental Laboratory (INEEL) in 2002.

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