2015

Body Cavities Screening Systems

Source: TSA

Homeland Security Research Corp.

Body Cavities Screening Systems – 2015

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1.1 Body Cavities Screening Systems

A body cavity search should be required when there is reasonable cause to believe that a *serious* breach of security has occurred or if there is sufficient reason to believe that an individual is carrying plastic explosives.

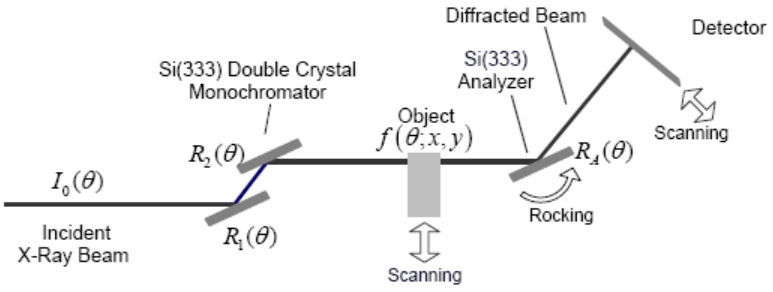
HSRC forecasts that "internally carried" bombs represent a real and growing threat and the technology must be developed to meet this challenge.

In the recent attack on the head of Saudi security, Abdullah Hassan Al Aseeri used his anal cavity to conceal a pound of explosives. The target, a Saudi prince, survived but Al-Aseeri was reportedly blown in half by the blast.

A team at Nesch LLC (Crown Point, Indiana), developed a technology or DEXI that combines X-ray diffraction imaging or DEXI with multiple X-ray imaging. It is a phase-sensitive imaging method called multiple-image radiography (MIR) which is an improvement on the known diffraction enhanced imaging (DEI).

MIR simultaneously produces several images from a set of measurements made with a single X-ray beam. Specifically, MIR yields three images depicting separately the effects of refraction, ultra-small-angle scatter, and attenuation by the screened object. All three images have good contrast, in part because they do not suffer from degradation due to Compton scatter. MIR yields a comprehensive object description, consisting of the angular intensity spectrum of the transmitted X-ray beam within the narrow angular range X-ray particles recorded by the radiation detector.

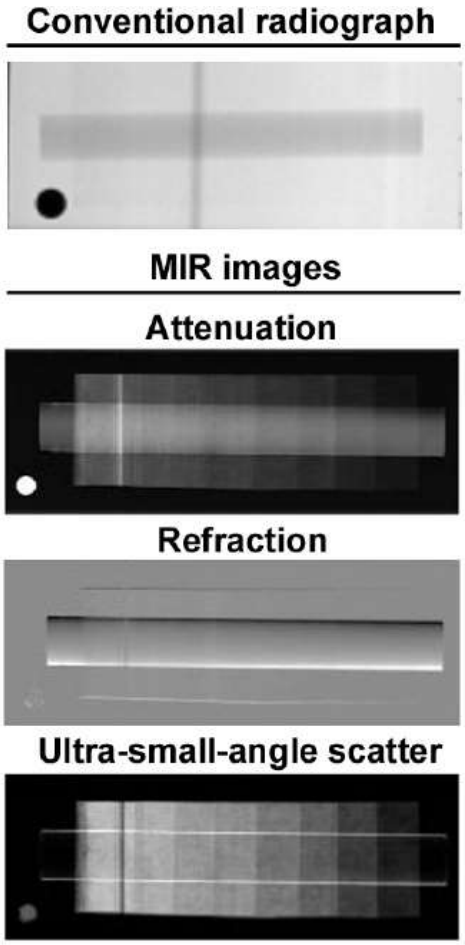
Figure 1 - Multiple-Image Radiography (MIR) Technology



Rather than simply shining X-rays through the subject and looking at the amount that passes through (like a conventional X-ray machine), DEXI analyzes the X-rays that are scattered or refracted by soft tissue or other low-density material. Conventional X-rays show little more than the skeleton, but the new technique

can reveal far more which makes it useful for security applications. The DEXI uses significantly less radiation than other approaches.

Figure 2 - MIR Projection Images, vs. Conventional Radiography

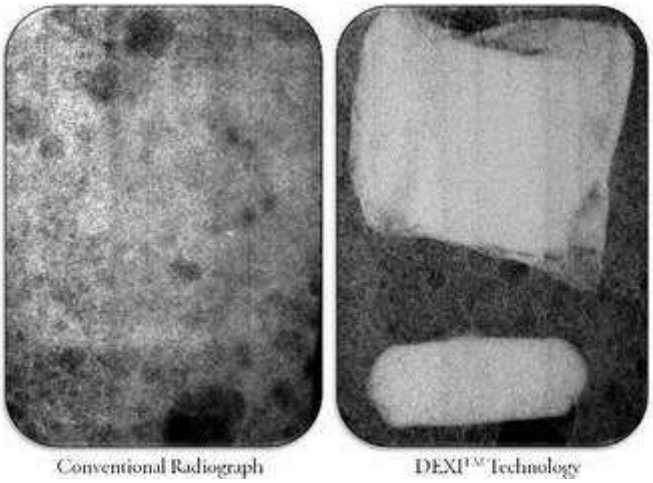


(**Source**: Wernick, Et.Al.)

According to company CEO, Mr. Ivan Nesch, "Our patented technology can detect substances such as explosive materials, narcotics, and low-density plastics hidden inside or outside of the human body".

The process of taking the images, analyzing them, and then recognizing substances of interest — such as explosives — can be automated. Alerts issued can be computer-generated. Security staff would simply have to get passengers in and out of the imaging unit.

Figure 3 - A Conventional Radiograph vs. DEXI Technology



(**Source**: Nesch LLC)

More information can be found at:

Global People Security Screening: Technologies, Industry & Market – 2015-2020