

Technology Description: Radiation Exposure of Body Scanners

Key Stakeholders: TSA, USSS, CBP, USCG,

Technology Facts:

- The American National Standards Institute (ANSI) is a private organization that develops consensus standards by chartering subcommittees of experts. The Center for Devices and Radiological Health (CDRH) can use the standards written by an ANSI committee to classify a system that does not fall into one of the main categories specified in the mandatory standards. The ANSI standard N43.17 "Radiation Safety for Personnel Security Screening Systems Using X-rays" is one such standard. The standard covers dose to subject, interlocks, operational procedures, information to provide to subjects, training for operators as well as other information.
- ANSI N43.17-2009 allows up to 25 microRems per scan, front and back), and up to 5,000 scans per year.
- The only currently TSA qualified backscatter-based system, the Rapiscan, scans front and back simultaneously, 3 microrems per side for 6 microrems total per scan.
- Comparison of
 - 4,000,000 microrem Low-dose dental X-Ray
 - 400,000 microrem Average annual exposure, natural radiation sources, Denver
 - 300,000 microrem Average annual exposure, natural radiation sources, US
 - 1,000 microrem 1 hour in commercial jet at altitude
 - 25 microrem Max exposure ANSI N43.17 per scan
 - 6 microrem Measured exposure Rapiscan body scanner, front and back

Technology Limitations:

- Exposure limits within the ANSI N43.17 limits allow imaging using the Compton Scattering principle, commonly referred to as "Backscatter", which penetrate most clothing and only the first few millimeters of skin. They would not be able to detect any objects hidden behind folds of flesh or within subjects' bodies.
- Claims have been made that through-transmission X-Ray systems can be made with will comply with these limits, though these claims have not been substantiated by S&T personnel. through-transmission X-Ray systems would be able to detect objects hidden within bodies.