

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 allows up to 10 microRems per scan (20 microRems for front and back), and up to 5,000 scans per year.
- The only currently approved backscatter based system, the Rapiscan, exposes the passenger to 3 microrems per scan (6 microrems front and back, which are conducted simultaneously)
- 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
 - 20 microrem Max exposure ANSI N43.17, front and back
 - 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.