

HOMELAND SECURITY
STANDARDS PANEL
(ANSI-HSSP)
*Tenth Annual Plenary
Meeting and Workshop*

NOVEMBER 9-10, 2011 | ARLINGTON, VA

Larry Hudson

NIST

FROM BUGS TO BOMBS!



Ten Years of X-ray Standards

2001-2011

It all started with the anthrax bioterror attack via the US mail



White House OSTP Task Force on Mail Security:

USPS
NIST
AFRRI
FDA
Sandia
USDA



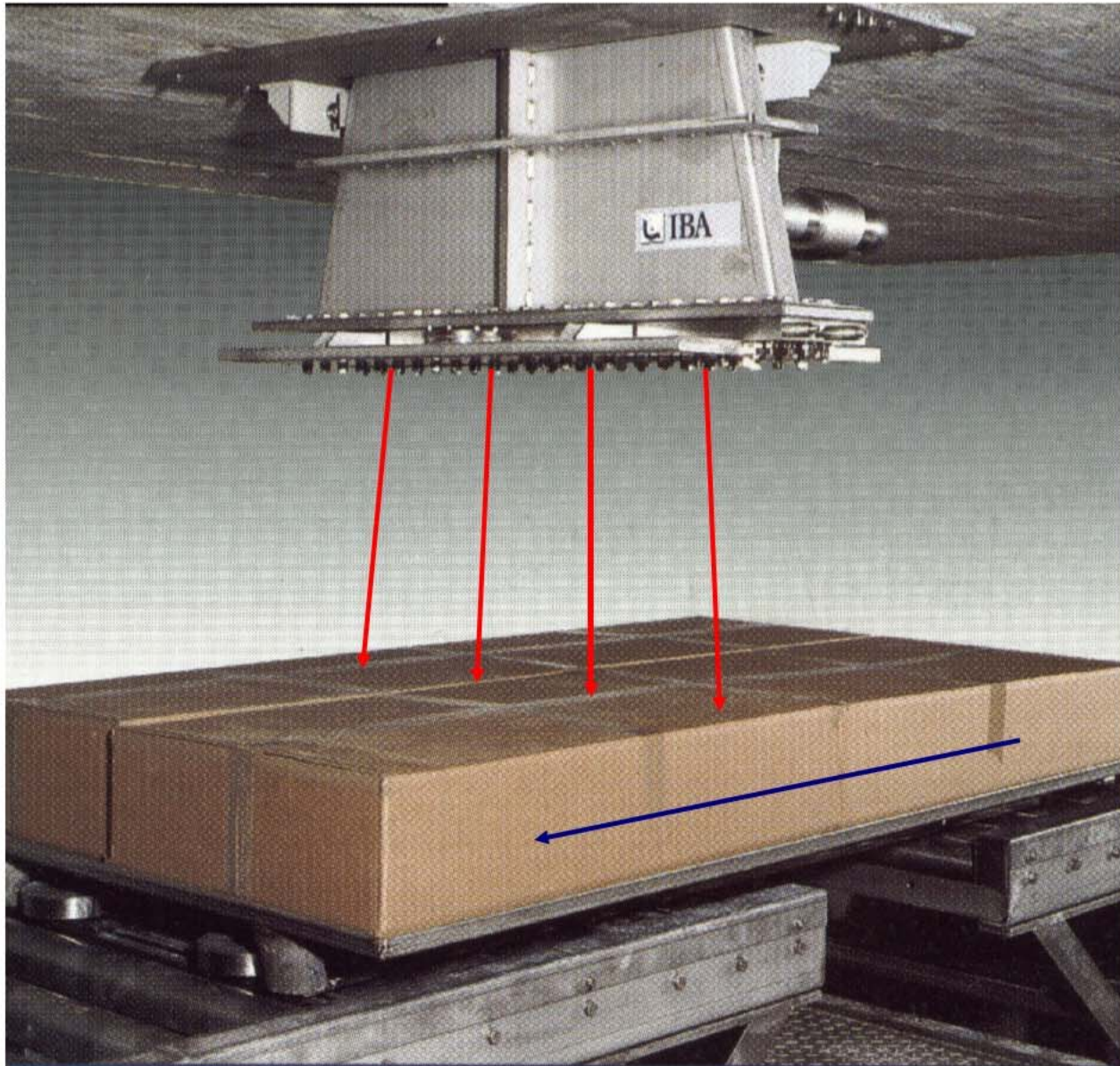
Task: Develop and Optimize Standard Sanitization Process & Protocols

Suspect mail from Trenton and Brentwood



New "Govt" mail



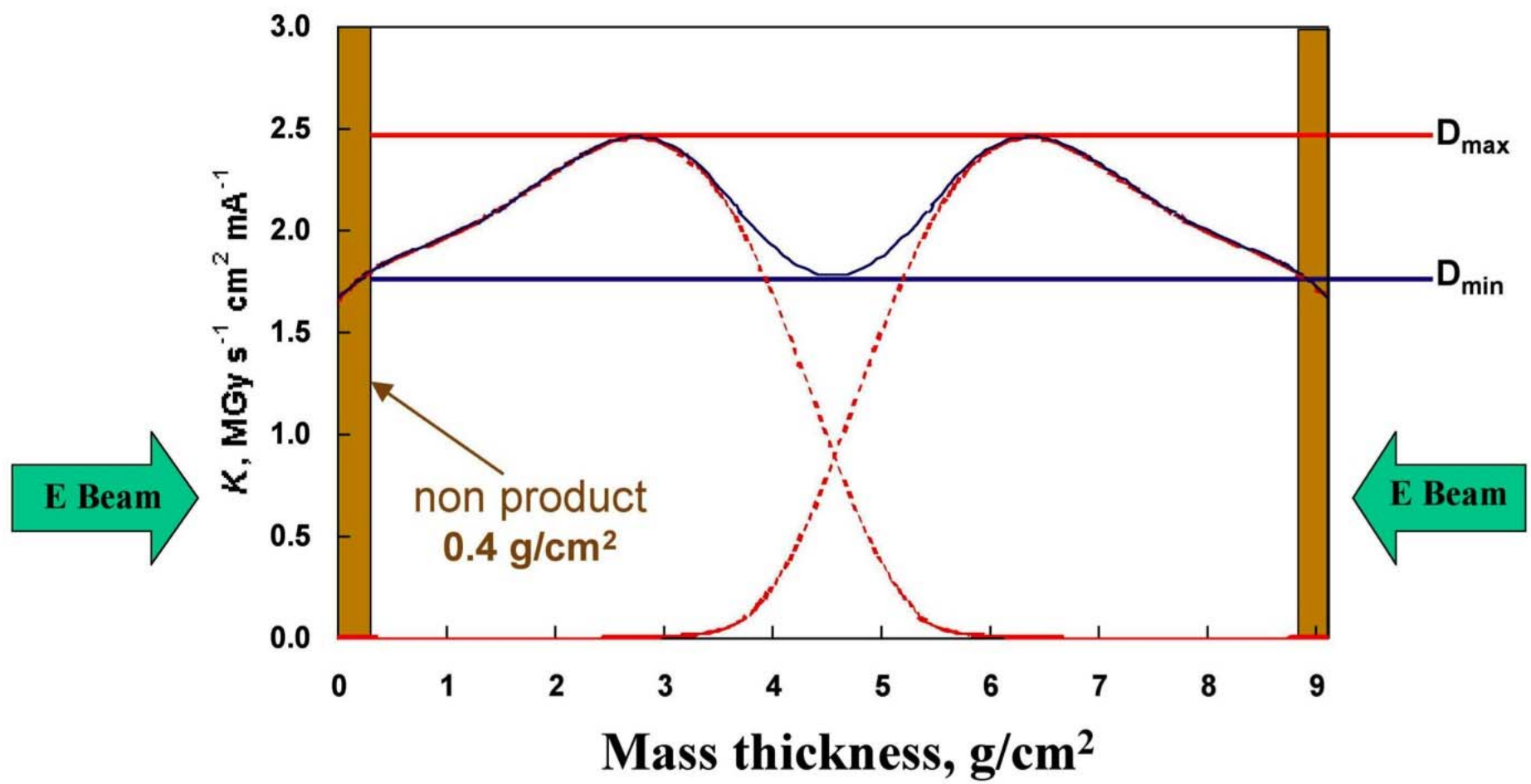


Sterigenics

**vertical
electron
beam
for**

letter mail

Two-sided irradiation by 10 MeV electron beams for letter mail

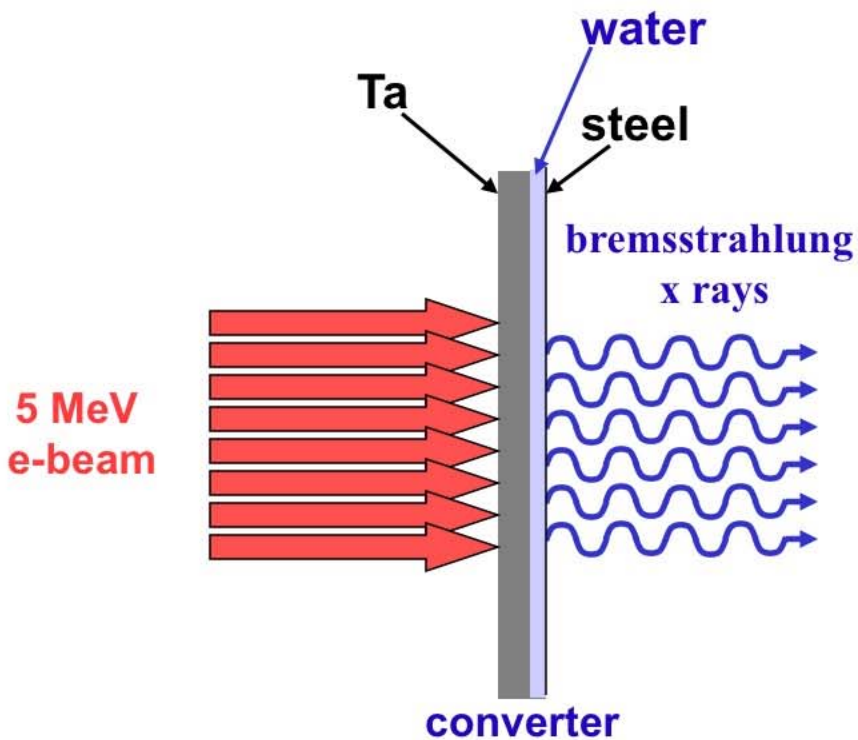


Protocol Validation: design and irradiate test mail instrumented with dosimeters and biological indicators, guided by computational dosimetry



X-Ray Standards

x-ray irradiation for parcel mail



Application of standard irradiation protocols to non-manmade hazards

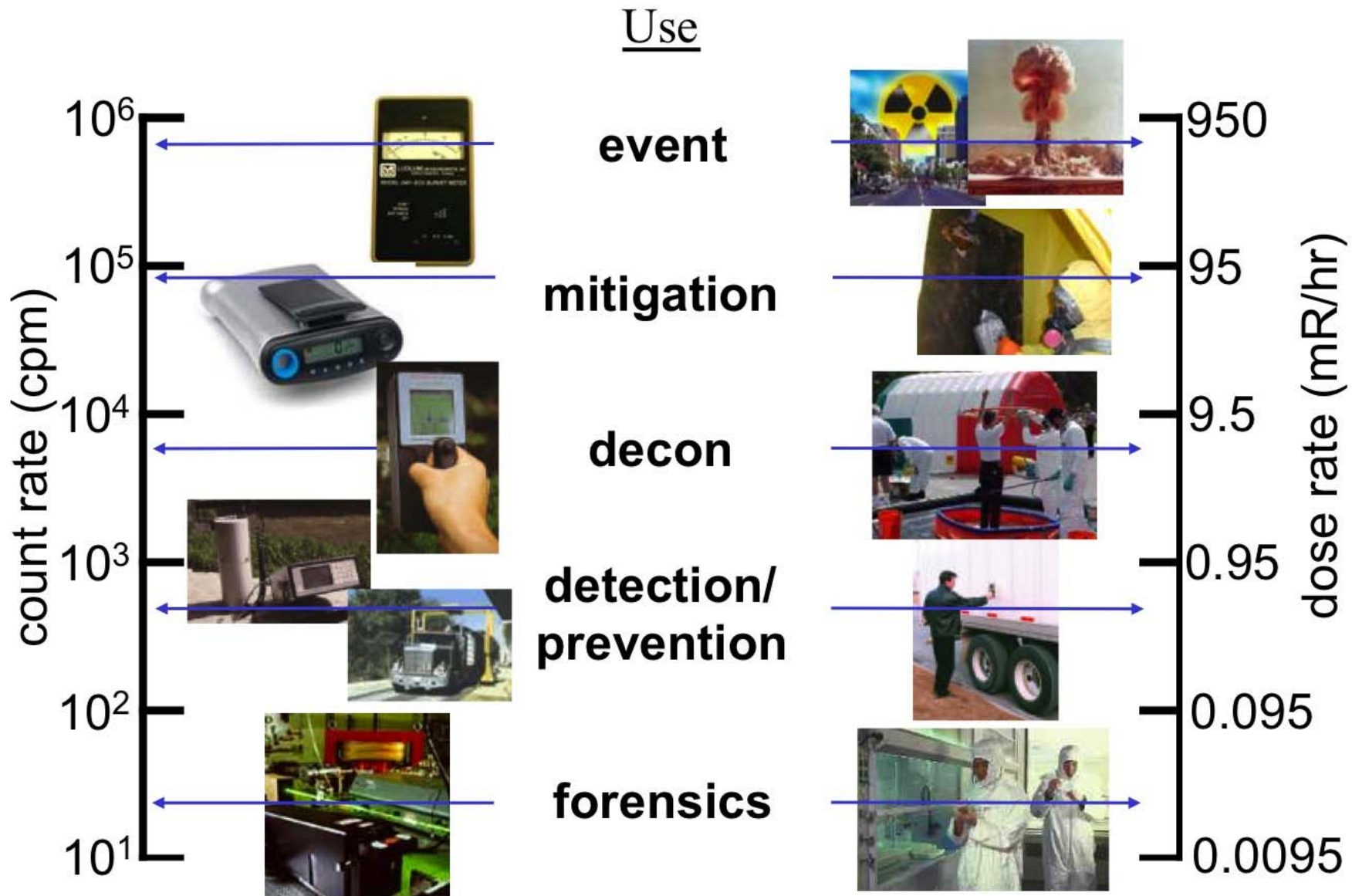
Irradiation of foods and spices to eliminate pests or extend shelf life



Sterilization of medical equipment



ANSI N42 RadNuc Standards



ANSI N42 RadNuc Standards

ANSI N42.32 Performance Criteria for Alarming Personal Radiation Detectors

ANSI N42.33 Portable Radiation Detection Instrumentation

ANSI N42.34 Performance Criteria for Hand-held Instruments for the Detection and Identification of Radionuclides

ANSI N42.35 Evaluation and Performance of Radiation Detection Portal Monitors

ANSI N42.38 Spectroscopy-Based Portal Monitors

ANSI N42.39 Performance Criteria for Neutron Detectors

ANSI N42.41 Performance Criteria for Active Interrogation Systems

ANSI N42.42 Data format standard for radiation detectors

ANSI N42.43 Mobile and Transportable Systems Including Cranes

ANSI N42.48 Performance Requirements for Spectroscopic Personal Radiation Detectors

ANSI N42.49 A & B Performance Criteria for Personal Emergency Radiation Detectors (PERDs) for Exposure Control

ANSI N42.53 Performance Criteria for Backpack Based Radiation Detector Systems

International RadNuc & X-Ray Standards

- **IEC 62523 (published)**
 - "Radiation protection instrumentation – Cargo/Vehicle radiographic inspection systems"
- **IEC 62484 (published)**
 - "Radiation protection instrumentation – Spectroscopy-based portal monitors used for the detection and identification of illicit trafficking of radioactive material"
- **IEC 62533 (published)**
 - "Radiation protection instrumentation – Highly sensitive hand-held instruments for photon detection of radioactive material"
- **IEC 62534 (published)**
 - "Radiation protection instrumentation – Highly sensitive hand-held instruments for neutron detection of radioactive material"
- **IEC 62618 (in development)**
 - "Radiation protection instrumentation – Spectroscopy-based alarming personal radiation devices (SPRD) for detection of illicit trafficking of radioactive material"
- **IEC 62694 (in development)**
 - "Radiation protection instrumentation - Portable radiation scanners (PRS) for detection of illicit trafficking of radioactive material"
- **IEC 62709 (in development)**
 - Measuring the Imaging Performance of X-ray and Gamma-ray Systems for Security Screening of Humans"



N42.4x

American National Standards for
Evaluation and Performance of X-ray
Security Screening Systems

Accredited by the American National Standards Institute

Sponsored by the
National Committee on Radiation Instrumentation, N42



Published by

The Institute of Electrical and Electronics Engineers, Inc.

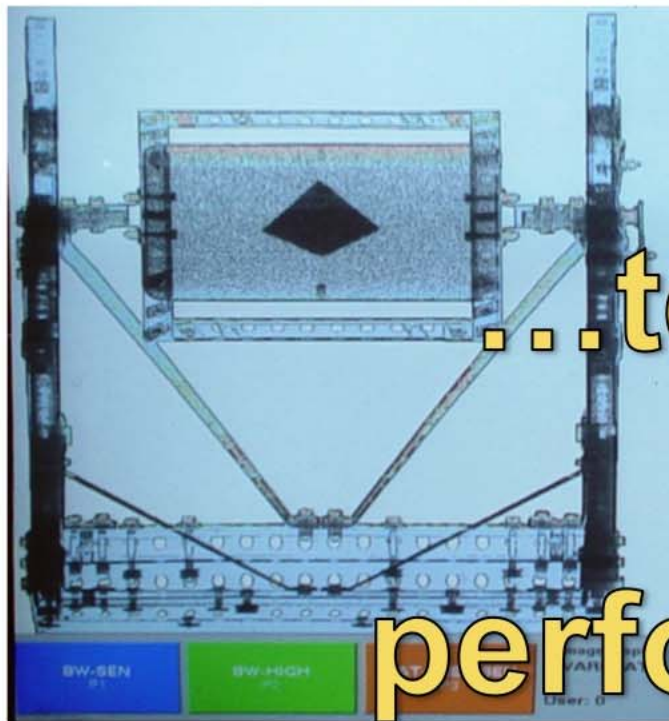
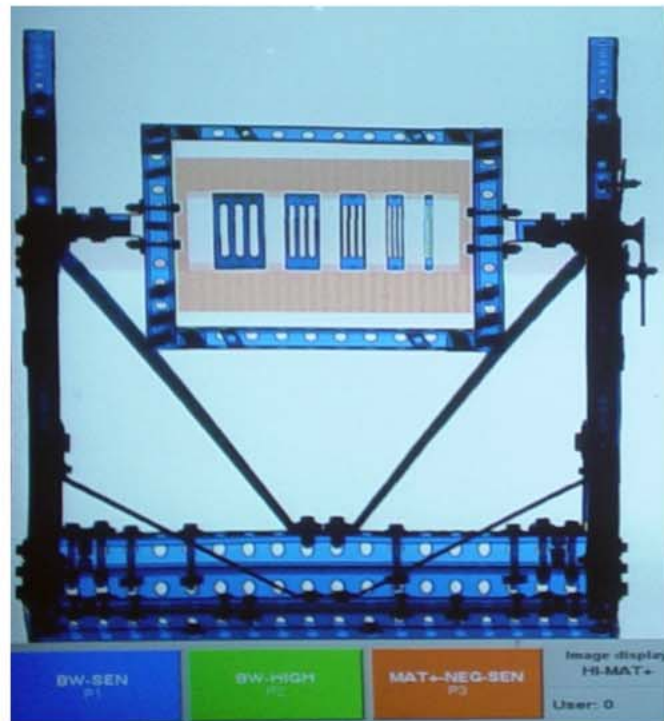
3 Park Avenue, New York, NY 10016-5997, USA

Print: SH95206
PDF: SS95206

National & international standards for bulk-explosives x-ray screening systems

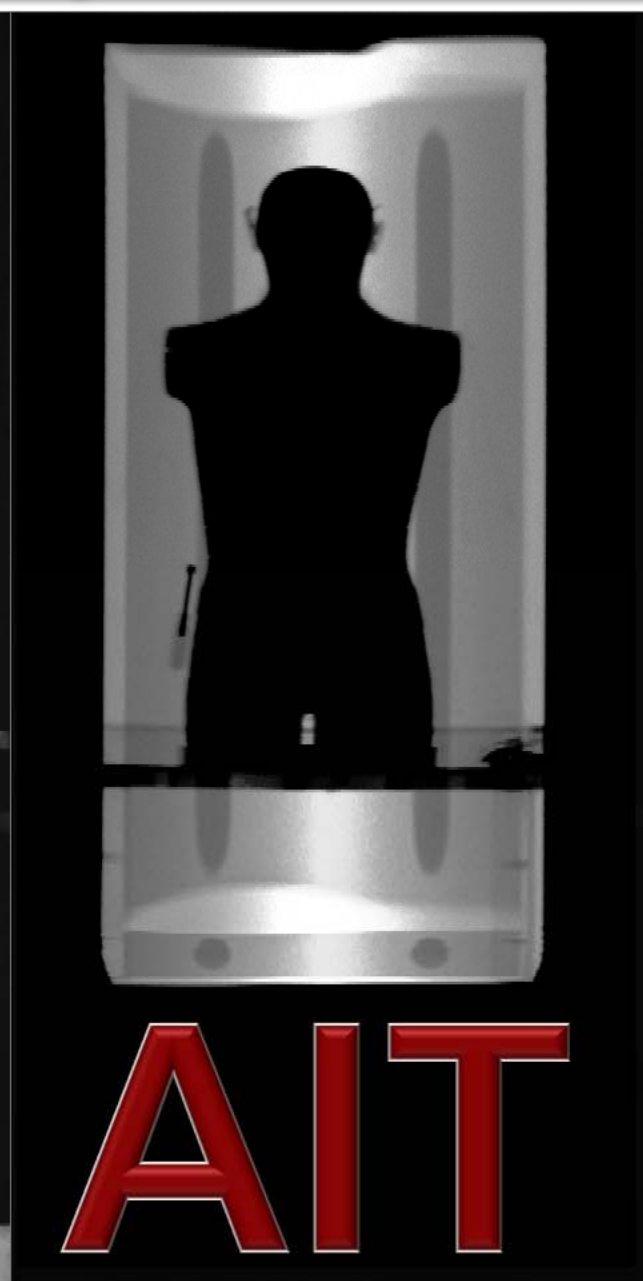
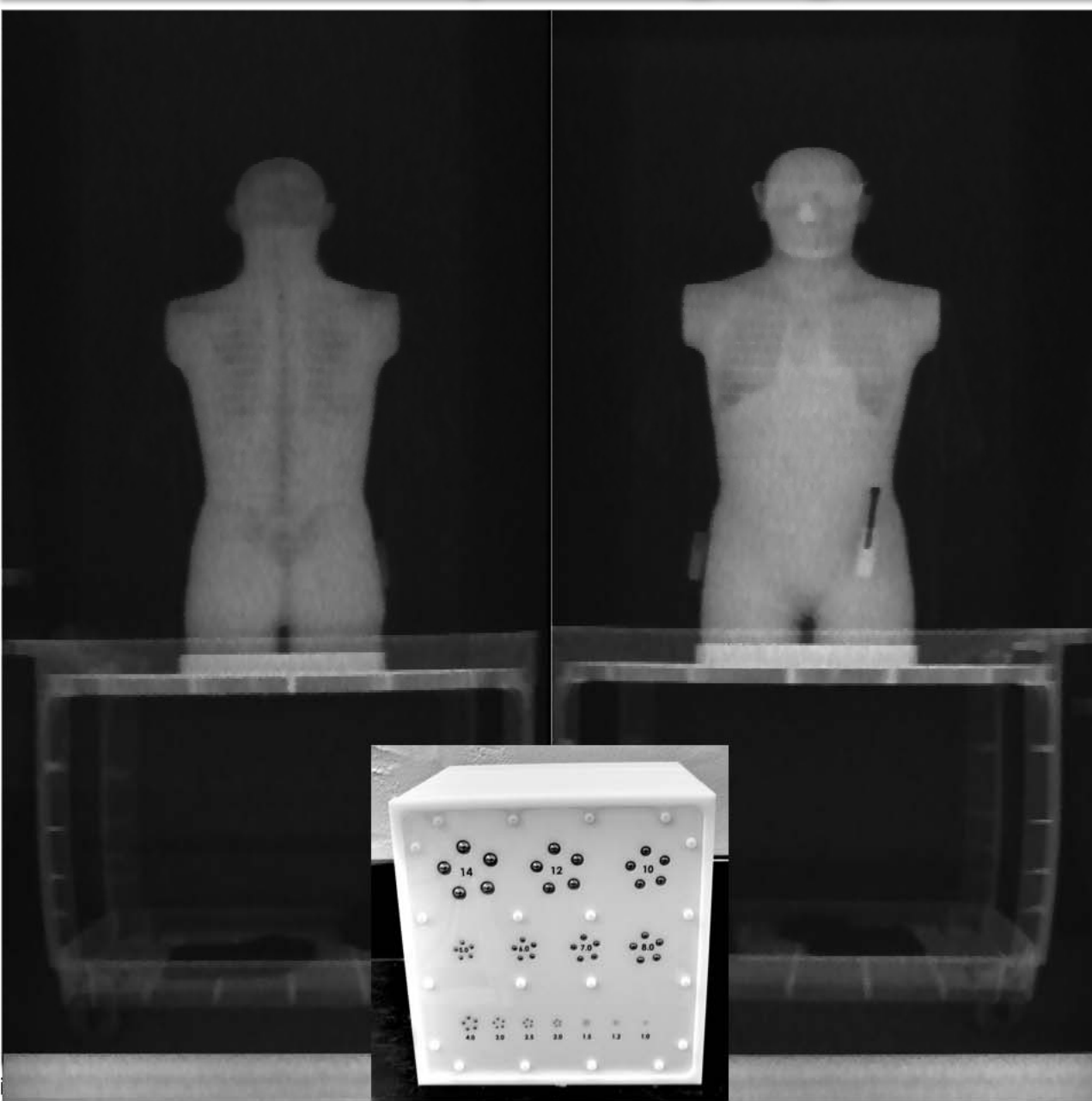
Venue	Technical Performance	Radiation Safety
Checkpoint	ANSI N42.44 – 2008 ASTM F 792 – 2008	ASTM F 1039; W2002 (21 CFR 1020.40)
CT / EDS (checked luggage)	ANSI N42.45-2011	ASTM F 1039; W2002 (21 CFR 1020.40)
Cargo / Vehicle	ANSI N42.46 – 2008 IEC 62523 – 2010 ANSI N42.41 – 2007	ANSI N43.16 – draft IEC 62523 – 2010 ANSI N43.14 – approved
Whole Body Imaging (AIT)	ANSI N42.47 – 2010 IEC 62709 – CD1	ANSI/HPS N43.17 – 2009 ANSI/ANS 6.1.1-1991; W2001* IEC 62463 – 2010
Bomb Squads (portable sources)	NIJ 0603.01 ANSI N42.55 – draft	ANSI/HPS N43.3-2008

T&E with
standard test
artifacts
gauging...

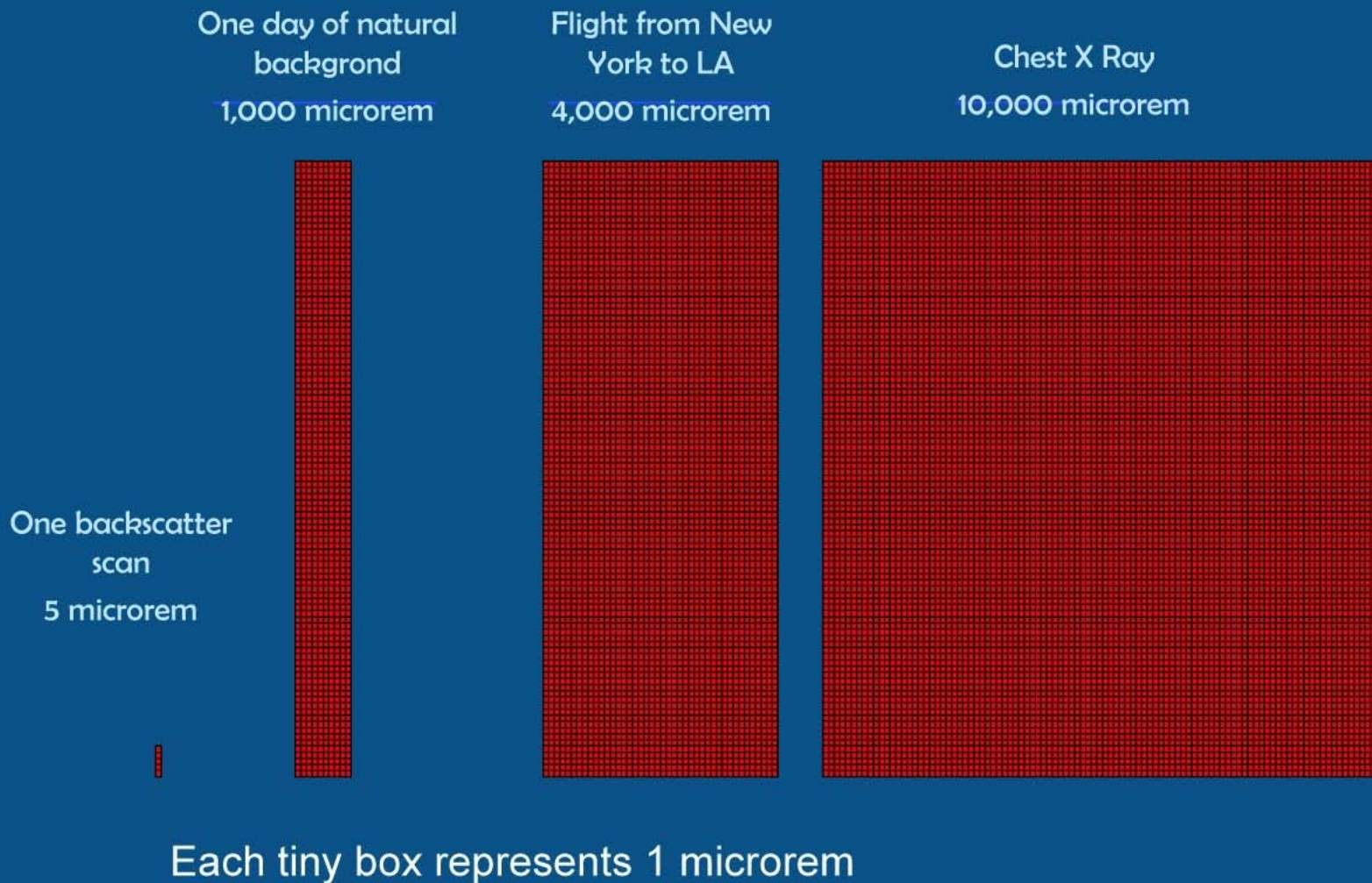


...technical
imaging
performance

Whole-body imaging & safety standards



Radiation Dose Comparisons





Harmonizing Cargo Standards

Questions?



Questions?