



Standard Guide for Selection and Use of Portable Radiological Survey Instruments for Performing In Situ Radiological Assessments in Support of Decommissioning¹

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1. Scope

1.1 This standard provides recommendations on the selection and use of portable instrumentation that is responsive to levels of radiation that are close to natural background. These instruments are employed to detect the presence of residual radioactivity that is at, or below, the criteria for release from further regulatory control of a component to be salvaged or reused, or a surface remaining at the conclusion of decontamination and/or decommissioning.

1.2 The choice of these instruments, their operating characteristics and the protocols by which they are calibrated and used will provide adequate assurance that the measurements of the residual radioactivity meet the requirements established for release from further regulatory control.

1.3 This standard is applicable to the in situ measurement of radioactive emissions that include:

- 1.3.1 alpha
- 1.3.2 beta (electrons)
- 1.3.3 gamma
- 1.3.4 characteristic x-rays

1.3.5 The measurement of neutron emissions is not included as part of this standard.

1.4 This standard does not address instrumentation used to assess residual radioactivity levels contained in air samples, surface contamination smears, bulk material removals, or half/whole body personnel monitors.

1.5 This standard does not address records retention requirements for calibration, maintenance, etc. as these topics are considered in several of the referenced documents.

2. Referenced Documents

2.1 ASTM Standards:

- E 170 Standard Terminology Relating to Radiation Measurements and Dosimetry²
- E 181 Standard General Methods for Detector Calibration

and Analysis of Radionuclides²

C 1215 Standard Guide for Preparing and Interpreting Precision and Bias Statements in Test Method Standards Used in the Nuclear Industry³

2.2 ANSI Standards:

ANSI N323 Radiation Protection Instrumentation Test and Calibration⁴

ANSI N15.5 Statistical Terminology and Notation for Nuclear Materials Management⁴

ANSI N42.17A Performance Specifications for Health Physics Instrumentation-Portable Instrumentation for Use in Normal Environmental Conditions⁴

ANSI N42.17C Performance Specifications for Health Physics Instrumentation-Portable Instrumentation for Use in Extreme Environmental Conditions⁴

ANSI N42.3 Standard Test Procedure for Geiger Mueller Counters⁴

2.3 National Council on Radiation Protection and Measurements:

NCRP Report No. 57 Instrumentation and Monitoring Methods for Radiation Protection, National Council on Radiation Protection and Measurements, May 1978⁵

NCRP Report No. 58 A Handbook of Radioactivity Measurement Procedures, National Council on Radiation Protection and Measurements, 2nd Ed. February 1985⁵

NCRP Report No. 112 Calibration of Survey Instruments Used in Radiation Protection for the Assessment of Ionizing Radiation Fields and Radioactive Surface Contamination, National Council on Radiation Protection and Measurements, December 1991⁵

2.4 International Organization for Standardization (ISO): ISO-4037 X and Gamma Reference Radiations for Calibrating Dosimeters and Dose-rate Meters and for Determining their Response as a Function of Photon Energy, International Organization for Standardization, 1979⁶

¹ This guide is under the jurisdiction of ASTM Committee E10 on Nuclear Technology and Applications and is the direct responsibility of Subcommittee E10.03 on Radiological Protection for Decontamination and Decommissioning of Nuclear Facilities and Components.

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² Annual Book of ASTM Standards, Vol 12.02.

³ Annual Book of ASTM Standards, Vol 12.01.

⁴ American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036

⁵ National Council on Radiation Protection and Measurement, 7910 Wodmont Ave., Bethesda, MD 20814

⁶ Available from ANSI Sales Department, 1430 Broadway, New York, NY 10018