



Standard Guide for Application of Neutron Spectrum Adjustment Methods in Reactor Surveillance, E 706 (IIA)¹

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1. Scope

1.1 This guide covers the analysis and interpretation of the physics dosimetry for Light Water Reactor (LWR) surveillance programs. The main purpose is the application of adjustment methods to determine best estimates of neutron damage exposure parameters and their uncertainties.

1.2 This guide is also applicable to irradiation damage studies in research reactors.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

- E170 Terminology Relating to Radiation Measurements and Dosimetry
- E262 Test Method for Determining Thermal Neutron Reaction Rates and Thermal Neutron Fluence Rates by Radioactivation Techniques
- E263 Test Method for Measuring Fast-Neutron Reaction Rates by Radioactivation of Iron
- E264 Test Method for Measuring Fast-Neutron Reaction Rates by Radioactivation of Nickel
- E265 Test Method for Measuring Reaction Rates and Fast-Neutron Fluences by Radioactivation of Sulfur-32
- E266 Test Method for Measuring Fast-Neutron Reaction Rates by Radioactivation of Aluminum
- E393 Test Method for Measuring Reaction Rates by Analysis of Barium-140 From Fission Dosimeters

- E481 Test Method for Measuring Neutron Fluence Rates by Radioactivation of Cobalt and Silver
- E482 Guide for Application of Neutron Transport Methods for Reactor Vessel Surveillance, E706 (IID)
- E523 Test Method for Measuring Fast-Neutron Reaction Rates by Radioactivation of Copper
- E526 Test Method for Measuring Fast-Neutron Reaction Rates by Radioactivation of Titanium
- E693 Practice for Characterizing Neutron Exposures in Iron and Low Alloy Steels in Terms of Displacements Per Atom (DPA), E 706(ID)
- E704 Test Method for Measuring Reaction Rates by Radioactivation of Uranium-238
- E705 Test Method for Measuring Reaction Rates by Radioactivation of Neptunium-237
- E706 Master Matrix for Light-Water Reactor Pressure Vessel Surveillance Standards, E 706(0) (Withdrawn 2011)³
- E844 Guide for Sensor Set Design and Irradiation for Reactor Surveillance, E 706 (IIC)
- E853 Practice for Analysis and Interpretation of Light-Water Reactor Surveillance Results, E706(IA)
- E854 Test Method for Application and Analysis of Solid State Track Recorder (SSTR) Monitors for Reactor Surveillance, E706(IIIB)
- E910 Test Method for Application and Analysis of Helium Accumulation Fluence Monitors for Reactor Vessel Surveillance, E706 (IIIC)
- E1005 Test Method for Application and Analysis of Radiometric Monitors for Reactor Vessel Surveillance, E 706 (IIIA)
- E1018 Guide for Application of ASTM Evaluated Cross Section Data File, Matrix E706 (IIB)
- E2005 Guide for Benchmark Testing of Reactor Dosimetry in Standard and Reference Neutron Fields
- E2006 Guide for Benchmark Testing of Light Water Reactor Calculations

2.2 Nuclear Regulatory Commission Documents:⁴

- NUREG/CR-1861 PCA Experiments and Blind Test

¹ This guide is under the jurisdiction of ASTM Committee E10 on Nuclear Technology and Applications and is the direct responsibility of Subcommittee E10.05 on Nuclear Radiation Metrology. A brief overview of Guide E944 appears in Master Matrix E706 in 5.3.1(IIA).

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website. DOI: 10.1520/E0944-08.

³ The last approved version of this historical standard is referenced on www.astm.org.

⁴ Available from Superintendents of Documents, U. S. Government Printing Office, Washington, DC 20402.