



Standard Practice for Analysis and Interpretation of Light-Water Reactor Surveillance Results¹

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1. Scope

1.1 This practice covers the methodology, summarized in [Annex A1](#), to be used in the analysis and interpretation of neutron exposure data obtained from LWR pressure vessel surveillance programs; and, based on the results of that analysis, establishes a formalism to be used to evaluate present and future condition of the pressure vessel and its support structures² (**1-74**).³

1.2 This practice relies on, and ties together, the application of several supporting ASTM standard practices, guides, and methods (see Master Matrix [E706](#)) (**1, 5, 13, 48, 49**).² In order to make this practice at least partially self-contained, a moderate amount of discussion is provided in areas relating to ASTM and other documents. Support subject areas that are discussed include reactor physics calculations, dosimeter selection and analysis, and exposure units.

1.3 This practice is restricted to direct applications related to surveillance programs that are established in support of the operation, licensing, and regulation of LWR nuclear power plants. Procedures and data related to the analysis, interpretation, and application of test reactor results are addressed in Practice [E1006](#), Guide [E900](#), and Practice [E1035](#).

1.4 *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.*

¹ This practice 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.

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² ASTM Practice [E185](#) gives reference to other standards and references that address the variables and uncertainties associated with property change measurements. The reference standards are A370, E8, E21, E23, and E208.

³ The boldface numbers in parentheses refer to the list of references appended to this practice. For an updated set of references, see the E706 Master Matrix.

2. Referenced Documents

2.1 ASTM Standards:⁴

- [E185 Practice for Design of Surveillance Programs for Light-Water Moderated Nuclear Power Reactor Vessels](#)
- [E482 Guide for Application of Neutron Transport Methods for Reactor Vessel Surveillance, E706 \(IID\)](#)
- [E509 Guide for In-Service Annealing of Light-Water Moderated Nuclear Reactor Vessels](#)
- [E706 Master Matrix for Light-Water Reactor Pressure Vessel Surveillance Standards, E 706\(0\) \(Withdrawn 2011\)⁵](#)
- [E844 Guide for Sensor Set Design and Irradiation for Reactor Surveillance, E 706 \(IIC\)](#)
- [E854 Test Method for Application and Analysis of Solid State Track Recorder \(SSTR\) Monitors for Reactor Surveillance, E706\(IIB\)](#)
- [E900 Guide for Predicting Radiation-Induced Transition Temperature Shift in Reactor Vessel Materials, E706 \(IIF\)](#)
- [E910 Test Method for Application and Analysis of Helium Accumulation Fluence Monitors for Reactor Vessel Surveillance, E706 \(IIIC\)](#)
- [E944 Guide for Application of Neutron Spectrum Adjustment Methods in Reactor Surveillance, E 706 \(IIA\)](#)
- [E1005 Test Method for Application and Analysis of Radiometric Monitors for Reactor Vessel Surveillance, E 706 \(IIIA\)](#)
- [E1006 Practice for Analysis and Interpretation of Physics Dosimetry Results for Test Reactors, E 706\(II\)](#)
- [E1018 Guide for Application of ASTM Evaluated Cross Section Data File, Matrix E706 \(IIB\)](#)
- [E1035 Practice for Determining Neutron Exposures for Nuclear Reactor Vessel Support Structures](#)

⁴ 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.

⁵ The last approved version of this historical standard is referenced on www.astm.org.