



Designation: E2215 – 16

Standard Practice for Evaluation of Surveillance Capsules from Light-Water Moderated Nuclear Power Reactor Vessels¹

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1. Scope

1.1 This practice covers the evaluation of test specimens and dosimetry from light water moderated nuclear power reactor pressure vessel surveillance capsules.

1.2 Additionally, this practice provides guidance on reassessing withdrawal schedule for design life and operation beyond design life.

1.3 This practice is one of a series of standard practices that outline the surveillance program required for nuclear reactor pressure vessels. The surveillance program monitors the irradiation-induced changes in the ferritic steels that comprise the beltline of a light-water moderated nuclear reactor pressure vessel.

1.4 This practice along with its companion surveillance program practice, Practice E185, is intended for application in monitoring the properties of beltline materials in any light-water moderated nuclear reactor.²

1.5 Modifications to the standard test program and supplemental tests are described in Guide E636.

1.6 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

2. Referenced Documents

2.1 ASTM Standards:³

A370 Test Methods and Definitions for Mechanical Testing of Steel Products

E8/E8M Test Methods for Tension Testing of Metallic Materials

E21 Test Methods for Elevated Temperature Tension Tests of Metallic Materials

E23 Test Methods for Notched Bar Impact Testing of Metallic Materials

E170 Terminology Relating to Radiation Measurements and Dosimetry

E185 Practice for Design of Surveillance Programs for Light-Water Moderated Nuclear Power Reactor Vessels

E208 Test Method for Conducting Drop-Weight Test to Determine Nil-Ductility Transition Temperature of Ferritic Steels

E509 Guide for In-Service Annealing of Light-Water Moderated Nuclear Reactor Vessels

E636 Guide for Conducting Supplemental Surveillance Tests for Nuclear Power Reactor Vessels, E 706 (IH)

E693 Practice for Characterizing Neutron Exposures in Iron and Low Alloy Steels in Terms of Displacements Per Atom (DPA), E 706(ID)

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

E900 Guide for Predicting Radiation-Induced Transition Temperature Shift in Reactor Vessel Materials

E1214 Guide for Use of Melt Wire Temperature Monitors for Reactor Vessel Surveillance, E 706 (IIIE)

E1253 Guide for Reconstitution of Irradiated Charpy-Sized Specimens

E1820 Test Method for Measurement of Fracture Toughness

E1921 Test Method for Determination of Reference Temperature, T_o , for Ferritic Steels in the Transition Range

2.2 ASME Standards:⁴

Boiler and Pressure Vessel Code, Section III Subarticle NB-2000, Rules for Construction of Nuclear Facility Components, Class 1 Components, Materials

Boiler and Pressure Vessel Code, Section XI Nonmandatory Appendix A, Analysis of Flaws, and Nonmandatory Appendix G, Fracture Toughness Criteria for Protection against Failure

¹ This practice is under the jurisdiction of ASTM Committee E10 on Nuclear Technology and Applications and is the direct responsibility of Subcommittee E10.02 on Behavior and Use of Nuclear Structural Materials.

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² Prior to the adoption of these standard practices, surveillance capsule testing requirements were only contained in Practice E185.

³ 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.

⁴ Available from American Society of Mechanical Engineers, Third Park Avenue, New York, NY 10016.