Designation: ~~D4538 – 05ε1~~ D4538 – 13

Standard Terminology Relating to Protective Coating and Lining Work for Power Generation Facilities[1]

This standard is issued under the fixed designation D4538; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

~~ε[1] NOTE—An editorial correction was made in the Discussion of definition sag or sagging in May 2009.~~

1. Scope

1.1 This terminology covers terms and their definitions relevant to the use of protective coatings in nuclear power plants.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D16 Terminology for Paint, Related Coatings, Materials, and Applications
D1193 Specification for Reagent Water
D3843 Practice for Quality Assurance for Protective Coatings Applied to Nuclear Facilities
D3911 Test Method for Evaluating Coatings Used in Light-Water Nuclear Power Plants at Simulated Design Basis Accident (DBA) Conditions
D4227 Practice for Qualification of Coating Applicators for Application of Coatings to Concrete Surfaces
D4228 Practice for Qualification of Coating Applicators for Application of Coatings to Steel Surfaces
D4537 Guide for Establishing Procedures to Qualify and Certify Personnel Performing Coating and Lining Work Inspection in Nuclear Facilities
D4787 Practice for Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates
D5144 Guide for Use of Protective Coating Standards in Nuclear Power Plants
D5161 Guide for Specifying Inspection Requirements for Coating and Lining Work (Metal Substrates) (Withdrawn 2013)[3]
D5162 Practice for Discontinuity (Holiday) Testing of Nonconductive Protective Coating on Metallic Substrates
D5962 Guide for Maintaining Unqualified Coatings (Paints) Within Level I Areas of a Nuclear Power Facility (Withdrawn 2008)[3]

2.2 *Other Documents:*[4]

USNRC Regulatory Guide 8.8 Ensuring Occupational Radiation Exposure ALARA at Nuclear Power Stations
10CFR20.1 Standards for Protection Against Radiation

3. Terminology

acceptable coating or lining system, *n*—safety-related coating or lining system for which a suitability for application review that meets the plant licensing requirements has been completed and there is reasonable assurance that, when properly applied and maintained, the coating or lining will not detach under normal or accident conditions. **D5144**

ALARA, *n*—concept of reducing radiation exposure to personnel to levels "as low as reasonably achievable," as defined in the USNRC Regulatory Guide 8.8 and 10CFR20.1(C). **D5144**

blistering, *n*—formation of bubbles in a coating (paint) film. See D16 (take out ~~" ability~~ "ability to resist"). **D3911**

[1] This terminology is under the jurisdiction of ASTM Committee D33 on Protective Coating and Lining Work for Power Generation Facilities and is the direct responsibility of Subcommittee D33.92 on Definitions.

Current edition approved ~~Dec. 1, 2006~~Nov. 1, 2013. Published ~~January 2006~~December 2013. Originally approved in 1986. Last previous edition approved in ~~2004~~2005 as ~~D4538 – 95 (2004).~~D4538 – 05ε1 DOI: ~~10.1520/D4538-05E01.~~10.1520/D4538-13.

[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.

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

[4] Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, http://www.access.gpo.gov.

boiling water reactor (BWR), *n*—reactor in which the water moderator-coolant is boiled directly within the reactor core and the pressure in the reactor vessel is only slightly greater than the steam turbine pressure. **D3911**

certification, *n*—written documentation of qualification.

checking, *n*—slight breaks in the film that do not penetrate to the previously applied coating or to the substrate.

chemical spray, *n*—solution of chemicals that could be used during a loss of coolant accident (LOCA) to suppress the incident, to scavenge fission products, and to return the facility to near-ambient conditions. **D3911**

coating applicator, *n*—organization or individual responsible for applying a protective or decorative coating. **D3843**

coating manufacturer, *n*—organization responsible for manufacturing coating materials. **D3843**

Coating Service Level I, *n*—term used to describe areas inside the reactor containment where coating failure could adversely affect the operation of post-accident fluid systems and, thereby, impair safe shutdown. **D5144**

Coating Service Level II, *n*—term used to describe areas outside the reactor containment where coating failure could impair, but not prevent, normal operating performance; the function of Coating Level II coatings is to provide corrosion protection and decontaminability in those areas outside the reactor containment subject to radiation exposure and radionuclide contamination and Service Level II coatings are not safety-related. **D5144**

Coating Service Level III, *n*—term used to describe areas outside the reactor containment where coating failure could adversely affect the safety function of a safety-related structure, system, or component (SSC). **D5144**

coating system, *n*—polymeric protective film consisting of one or more coats, applied in a predetermined order by prescribed methods. **D3843**

coating work, *n*—an all-inclusive term to define all operations required to accomplish a complete coating job; the term shall be construed to include materials, equipment, labor, preparation of surfaces, control of ambient conditions, application and repair of coating systems, and inspection. **D3843**

coating work inspection, *n*—phase of quality control that, by means of examination, observation, or measurement, determines the conformance of coating work to predetermined quality requirements. **D4537**

Code of Federal Regulations (CFR), *n*—rules and regulations of the U.S. Federal Government; the code is subdivided into titles, with Title 10 (10 CFR) applying to energy. **D3843**

cracking, *n*—formation of breaks in a coating film that extend through to the underlying surface.

crawling, *n*—defect in which the wet film recedes from localized areas of the substrate (usually caused by insufficient wetting) leaving those areas uncoated. **D16**

curing, *n*—transformation of a coating or other material into a solid phase or film. **D3911**

damp, *adj*—moist but not visibly wet.

DBA qualified coating system, *n*—coating system used inside reactor containment that can be attested to having passed the required laboratory testing, including irradiation and simulated design basis accident (DBA), and has adequate quality documentation to support its use as DBA qualified. **D5144**

DBA unqualified coating system, *n*—coating system used inside reactor containment that cannot be attested to having passed the required laboratory testing, including irradiation and simulated DBA or has inadequate quality documentation, or both, to support its use as DBA qualified. **D5144**

deionized water, *n*—water prepared by an ion exchange process meeting the requirements of Specification D1193, Types II and III. **D3911**

delamination, *n*—separation of one coat or layer from another coat or layer or from the substrate. **D3911**

design basis accident (DBA), *n*—generic term for any one of a family of accident conditions that can result from postulated events.

DISCUSSION—

These conditions are generally associated with the rupture of high-energy piping. The more commonly recognized accident conditions used to evaluate coating systems for primary containment are the loss of coolant accident (LOCA) or main stream line break (MSLB). **D3911**

deviation, *n*—departure of a characteristic from established procedures or specified requirements. **D3843**