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Ms. Cindy Bladey
Office of Administration
Mail Stop: OWFN-12H08
U.S. Nuclear Regulatory Commission
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9/13/2016
81FR62935

(3)

Subject: Comments on Draft Regulatory Guide (RG) DG-1331, *"Service Level I, II, III, and In-Scope License Renewal Protective Coatings Applied to Nuclear Power Plants"* (*Federal Register* 81FR62935, dated September 13, 2016, Docket ID NRC-2016-0192)

This letter is being submitted in response to the U.S. Nuclear Regulatory Commission's (NRC's) request for comments concerning the subject draft Regulatory Guide (RG) DG-1331, *"Service Level I, II, III, and In-Scope License Renewal Protective Coatings Applied to Nuclear Power Plants,"* published in the *Federal Register* (i.e., 81FR62935, dated September 13, 2016).

This draft RG describes a method acceptable to the NRC for the selection, application, qualification, inspection, and maintenance of protective coatings applied to Nuclear Power Plants (NPPs). DG-1331 is proposed Revision 3 to RG 1.54 (same title) dated October 2010. This draft RG proposes to approve, with certain clarifications and exceptions, the use of American Society for Testing and Materials (ASTM) International Standard D 5144-08$^{\varepsilon 1}$, *"Standard Guide for Use of Protective Coating Standards in Nuclear Power Plants,"* and multiple sub-tier ASTM International Standards.

Exelon Generation Company, LLC (Exelon) appreciates the opportunity to comment on the subject draft RG and offers the attached comments for consideration by the NRC. Exelon also supports the comments submitted by the Nuclear Energy Institute (NEI) on behalf of the industry related to this draft RG.

If you have any questions or require additional information, please do not hesitate to contact Richard Gropp at (610) 765-5557.

Respectfully,

D. B. Helker

David P. Helker
Manager, Licensing and Regulatory Affairs
Exelon Generation Company, LLC

Attachment

SUNSI Review Complete
Template = ADM – 013
E-RIDS= ADM-03
Add= M. Yoder (mgy)
M. Orr (mpo1)

Comments Concerning Draft Regulatory Guide DG-1331, *"Service Level I, II, III, and In-Scope License Renewal Protective Coatings Applied to Nuclear Power Plants"*

This draft Regulatory Guide (RG) describes a method acceptable to the U.S. Nuclear Regulatory Commission (NRC) for the selection, application, qualification, inspection, and maintenance of protective coatings applied to Nuclear Power Plants (NPPs). DG-1331 is proposed Revision 3 to RG 1.54 (same title) dated October 2010. The draft RG proposes to approve, with certain clarifications and exceptions, the use of American Society for Testing and Materials (ASTM) International Standard D 5144-08$^{\varepsilon 1}$, *"Standard Guide for Use of Protective Coating Standards in Nuclear Power Plants,"* and multiple sub-tier ASTM International Standards.

Exelon Generation Company, LLC (Exelon) appreciates the opportunity to comment on DG-1331 and offers the following comments for consideration by the NRC.

General Comments

1. Exelon believes that reference to the proposed American Society for Testing and Materials (ASTM) standards will result in additional changes throughout the document including other references. The new standards being proposed may also potentially result in revisions to NRC guidance described in Section C, *"Staff Regulatory Guidance,"* of the draft RG.

2. The intent of the following comment is to address the generic observation that this draft RG appears to represent a shift in the reliance upon destructive examination techniques and methods, with respect to coating evaluations, as opposed to reliance and acceptance of visual inspections. Exelon requests that the following comment be generically considered, as it summarizes what has been done in order to previously obtain NRC formal written agreement that visual precursors can be acceptably used to predict coating degradation.

   In 2006, licensees typically followed the guidance in ASTM D5163-05a, "*Standard Guide for Establishing Procedures to Monitor the Performance of Coating Service Level I Coatings in an Operating Nuclear Power Plant,*" to conduct containment coatings condition assessment activities. ASTM D5163 had been endorsed by the NRC in RG 1.54, Revisions 1 and 2, and NUREG-1801, *"Generic Aging Lessons Learned (GALL) Report."* ASTM D5163 is predicated around the fact that Design Basis Accident (DBA) qualified reactor containment coatings will exhibit "visual precursors" prior to failure. These visual precursors can be identified by trained condition assessment personnel.

   To validate the visual precursor prior to failure concept, the Electric Power Research Institute (EPRI), the Nuclear Utilities Coating Council (NUCC), and ASTM Committee D33 needed to select a measurable physical property of DBA-qualified coatings which could be measured on visually-intact reactor containment protective coatings at commercial NPPs. The coating property selected was pull-off adhesion testing.

   EPRI and NUCC conducted a project entitled, *"Evaluation of Coating Failures and the Potential Influence of Aging."* Task 3 of the project involved adhesion testing of visually intact, DBA-qualified coatings on concrete and steel. ANSI N5.12-1974, Section 6.4 requires *"that containment coatings exhibit 200 lbs minimum adhesion when measured using an Elcometer adhesion tester."*

The pull-off adhesion testing was performed at four operating commercial NPP units, each with different protective coating systems on the reactor containment Structures, Systems, and Components (SSCs).

The procedure performed at each unit was as follows:

- Perform a documentation review at each volunteer plant to identify areas of DBA-qualified/acceptable coatings on steel and concrete substrates.
- Perform a general visual inspection of selected areas of DBA-qualified/acceptable coatings on steel and concrete substrates according to ASTM D5163-05a. Coated test areas include visually sound coatings and visually sound coatings adjacent to visually degraded coatings.
- Document each selected test area (including photography).
- At each test area, perform all of the following:
    - Dry film thickness testing as stated in SSPC-PA 2, ASTM D4138-94 (re-approved 2000), and/or ASTM D6132-04 as appropriate.
    - Adhesion testing according to ASTM D4541-02
    - Adhesion testing according to ASTM D6677-01

The results of the test program were provided to the industry and NRC in EPRI Report 1014883.

After completion of testing at all four volunteer plants, the following conclusions were reached by the NRC and documented in a document entitled *"NRC Staff Review Guidance Regarding Generic Letter 2004-02 Closure in the Area of Coatings Evaluation"* (ML080230462), in which the following discussion was provided (Page 2, Item 2):

> *"...In a letter to the Nuclear Energy Institute dated January 16, 2006 (ADAMS Accession Number ML053470467), the NRC staff expressed concerns regarding the adequacy of the current industry method for assessment of qualified coatings within containment. The staff specifically questioned the adequacy of visual assessment to verify the condition of qualified coatings. In response to the staff concerns, EPRI sponsored a project (see EPRI Report No. 1014883 July 2007) to collect coating adhesion data for coating systems applied in the containments of operating U.S. nuclear power plants to provide confirmatory support for coating inspection methods that rely upon visual inspection as an initial step. The staff has reviewed this report and determined that it provides adequate supporting evidence that the containment coatings monitoring approach contained in ASTM D5163, as implemented by licensees, and endorsed by USNRC in Regulatory Guide 1.54, Rev.1, and NUREG 1801, Vol. 2, Appendix XI.S8, is valid.*

Licensees may reference the EPRI coatings adhesion testing program as confirmation of the validity of their coatings assessment program. In addition, licensees may choose to provide a discussion of other activities in which they have participated in to support their coatings program. Such activities may include the EPRI Coatings Aging Task Group, the EPRI survey of coating failure operating experience, physical testing performed by the licensee, and plant operating experience with coating performance."

Exelon believes that the formal acceptance by the NRC of the use of visual assessment of coatings, as discussed in ASTM D5163, is clearly defined. Therefore, the suggestion in the draft RG that licensees include undefined extra coatings debris margin for undefined conservatism is considered by Exelon to be technically unsupported at this point.

Specific Comments

1. Page 5 – Last paragraph, last sentence

   Exelon recommends the following bolded changes for NRC consideration:

   *"...The first example is not covered by the Service Level I **and III** definition**s** because degradation of these coatings would not adversely affect the operation of post-accident fluid systems...."*

2. Page 7 – Figure 1

   Exelon recommends the following changes to the flowchart for NRC consideration:

   Revise

   - D5144-16 (recently reapproved/revised)
   - D4538-15
   - D4227-05 (Reapproved 2012)
   - D4228-05 (Reapproved 2012)
   - D4286-08 (Reapproved 2015)
   - D6677-07 (Reapproved 2012)
   - D7491-08 (Reapproved 2015)

   Delete

   - D3359

   Add

   - D7230-06 (Reapproved 2013) to first column of flowchart

   The RG should reflect current editions of standards, addition of newly developed standards, and deletion of standards that are no longer a part of ASTM. Therefore, Exelon suggests deleting D3359, as the tape referenced by the standard is no longer manufactured and renders the standard unusable. With regard to ASTM D7230, this is now part of ASTM D5144 and should be added.

3. Page 8 – Section 2.1

Exelon recommends the following strikethrough/bolded changes for NRC consideration:

> *"ASTM D 3843-**1600** (reapproved 2008), "Standard Practice for Quality Assurance for Protective Coatings Applied to Nuclear Facilities" (Ref. 16). The ASTM International approved and issued ASTM International Standard D 3843-**1600** as a ~~partial~~**complete** replacement for ANSI N101.4-1972. ASTM D 3843-**1600** provides QA practices that are acceptable to NRC staff and are applicable to safety related protective coating work in coating Service Level I areas of nuclear facilities. Service Level II coatings as defined above are not safety related, but they are ~~qualified~~**approved** by testing for their particular application by the manufacturer. Licensees and applicants may use applicable portions of the QA practices described in ASTM D 3843-**1600** as the basis for limited QA for protective coating work in coating Service Level II areas of nuclear facilities."*

The forthcoming ASTM committee revision of D3843 (16) was made to eliminate the "partial" replacement qualifier that the RG has applied in the past and is now a complete replacement to ANSI N101.4 and should be reflected here.

In addition, Service Level II coatings are not required to be tested for their applications as they are non-safety related coatings. The coatings are evaluated by Engineering to be suitable for their intended application.

4. Page 11 – Section 4.1.d

Exelon recommends the following strikethrough/bolded changes for NRC consideration:

> *"Although the ASTM D 5163-08 standard reasonably ensures that qualified coatings left in service after a visual inspection will remain adhered to their substrates under accident conditions, it ~~does~~**may** not guarantee that visual inspection will detect all degraded coatings...."*

To date, studies and operating experience have not definitively determined that visual inspections will not detect degraded coatings when performed. However, using the word "may" in the sentence provides the opportunity for some flexibility related to visual inspection in detecting degraded coatings.

5. Page 17 – Reference 31

Exelon recommends deleting the reference to D3359, since tape referenced in this standard is no longer available and this standard would no longer be usable.