UNITED STATES
NUCLEAR REGULATORY COMMISSION
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April 14, 2020

MEMORANDUM TO: Eric R. Oesterle, Chief
License Renewal Projects Branch
Division of New and Renewed Licenses
Office of Nuclear Reactor Regulation

FROM: William F. Burton, Senior Project Manager ***/RA/***
License Renewal Projects Branch
Division of New and Renewed Licenses
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF FEBRUARY 20, 2020, CATEGORY 2 PUBLIC MEETING ON LESSONS LEARNED FROM THE REVIEW OF THE FIRST SUBSEQUENT LICENSE RENEWAL APPLICATIONS

On March 28, 2019, the U.S. Nuclear Regulatory Commission (NRC) held a Category 2 public meeting to discuss the NRC staff and industry experience in the review of River Bend Station, Unit 1 initial license renewal application which piloted the optimized 18-month review process for subsequent license renewal (SLR) applications, as well as the reviews of the first three SLR applications: Turkey Point Nuclear Generating Units 3 and 4, Peach Bottom Atomic Power Station, Units 2 and 3, and Surry Power Station, Units 1 and 2. At this meeting, the staff and industry agreed that the highest priority was the identification of technical issues for which revisions to the Generic Aging Lessons Learned (GALL-SLR) and Standard Review Plan for Subsequent License Renewal (SRP-SLR) (NUREG-2191 and NUREG-2192, respectively) guidance documents are needed.

On December 12, 2019, the NRC held a second Category 2 public meeting to discuss lessons learned from the NRC staff reviews of the three SLR applications. The focus of this second meeting was on the technical issues that are ready for inclusion in revisions to the SLR guidance documents.

On February 20, 2020, the NRC held a third Category 2 public meeting to continue discussions regarding lessons learned from the review of the SLR applications. The focus of this third meeting was the review of summaries prepared by the staff that address guidance revisions proposed by the industry. The staff was in alignment with the industry on most of the proposed revisions, with several exceptions (discussed below).

The public meeting agenda (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20050D439) included presentation slides and summaries by the NRC staff.

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ADAMS Accession No.: ML20076E074 ***via email** **NRR-106**

OFFICE	PM: DNRL:NLRP	BC: DNRL:NLRP	PM: DNRL:NLRP
NAME	WBurton	EOesterle*	WBurton
DATE	3/16/2020	3/16/2020	4/14/2020

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Main Messages

- The NRC staff and the industry are aligned on many of NEI's proposed revisions. Staff will proceed with developing ISGs for those areas of alignment.
- For two proposed revisions, the staff and industry are not yet aligned. Staff and industry will continue to engage in public dialogue on these areas, as necessary.

Summary of Discussions

Approximately 80 participants attended the meeting in person or by phone.

Following the welcome of meeting attendees, NEI and the staff discussed the following items:

AMPs XI.M2 and XI.M21A: Water Chemistry Updates (ML20049H348 and ML20049H352)

As discussed in the previous meeting, the staff plans to revise these programs to include the latest revisions of EPRI water chemistry guidelines for BWRs, PWRs, and closed cooling water systems. The staff presented its proposed revisions with the associated technical bases in the above cited ADAMS Accession Nos.

AMP XI.M12: Thermal Aging Embrittlement of CASS (ML20049H349)

NEI proposed to revise the "acceptance criteria" program element of GALL-SLR AMP XI.M12 to add the 2019 Edition of ASME Code, Section XI, Non-mandatory Appendix C, which provides flaw evaluation procedures for cast austenitic stainless steel (CASS) with ferrite content ≥ 20 percent.

The staff has noted that rulemaking activities are ongoing to incorporate by reference the 2019 Edition of ASME Code, Section XI in 10 CFR 50.55a. Given the ongoing rulemaking status, the NRC staff finds that Appendix C to the 2019 Edition of ASME Code, Section XI may be used in GALL-SLR AMP XI.M12 until the appendix is formally incorporated by reference in 10 CFR 50.55a. Once the appendix is incorporated by reference in 10 CFR 50.55a, the program may use the appendix as incorporated by reference in 10 CFR 50.55a.

AMP XI.M16A: MRP-227 Rev 1A (ML20049H350)

NEI proposed to incorporate MRP-227 Rev 1-A as an acceptable basis for the Gap Analysis of PWR Vessel Internals.

The staff is updating this AMP and associated AMR guidance for PWR RVI components in NUREG-2191 (the GALL-SLR Report) and AMR criteria in NUREG-2192 (the SRP-SLR Report) based on programmatic changes made to the I&E criteria for PWR RVI components in EPRI Report No. 2002005349 (MRP-227, Revision 1) and lessons learned gained from the staff's review of the first two subsequent license renewal applications (SLRAs) for PWRs, including (1) relevant operating experience involving age-related degradation of designated PWR RVI components and (2) the results of the gap analyses that were included in the first two PWR SLRAs for the design of PWR RVI components at the facilities.

During the meeting it was recommended that EPRI Report No. 3002017168 (MRP-227 Revision 1-A) should be referenced rather than EPRI Report 2002005349 (MRP-227, Revision 1). The Staff safety evaluation incorporated in MRP-227 Rev 1-A includes evaluation of several changes to MRP-227 Rev 1 that were incorporated into MRP-227 Rev 1-A

AMP XI.M42: Internal Coatings/Linings (ML20049H355 and ML20049H357)

NEI proposed to revise program environments and associated line items to (a) add air and condensation environments to the scope of the program; (b) add soil, concrete, and underground external environments to the FSAR Supplement; and (c) correct inconsistencies for the lubricating oil environment. In addition, a new GALL SLR line items for management of loss of coating/lining integrity and loss of material for piping, piping components, heat exchangers, and tanks with internal coatings/linings exposed to air dry will be added.

NEI also proposed to revise this program and associated line items to recommend opportunistic inspections, in lieu of periodic inspections, as an acceptable alternative for buried internally coated/lined fire water system piping provided: (a) flow tests and internal piping inspections will occur at intervals specified in NFPA 25, "Standard for the Inspection, Testing, and Maintenance of Water Based Fire Protection Systems," or as modified by AMP XI.M27, "Fire Water System," Table XI.M27-1, "Fire Water System Inspection and Testing Recommendations"; (b) through-wall flaws in the piping can be detected through continuous system pressure monitoring; and (c) plant-specific operating experience (OE) is acceptable (i.e., no leaks due to age related degradation).

Industry agrees that opportunistic inspections, in lieu of periodic inspections, for buried internally coated/lined fire water system piping are an appropriate approach, however, they did not agree with additional conditions proposed by the staff. Specifically, they disagreed with the additional condition that "plant-specific operating experience is acceptable (i.e., no leaks due to age-related degradation)." Industry noted that portions of the Fire Water System are not within the scope of subsequent license renewal and those portions that are not in scope may have leaks due to aging. However, in accordance with the current licensing basis, the jockey pump keeps the system functional in the presence of leaks. It was noted that maintenance on the out-of-scope portions may be deferred. Industry also noted that the additional condition on operating experience did not include a timeframe.

Further discussions on this change may include the need for the other two additional conditions, but the focus of the discussion was on the additional operational experience condition. The staff plans further discussions on this issue.

Further Evaluation Regarding Reactor Pressure Vessel Steel Supports (ML20049H359)

NEI proposed to revise the SLR guidance documents to address loss of fracture toughness due to irradiation embrittlement for steel structural support components, and related non-metallic components other than concrete, located in the vicinity of the Reactor Vessel (RV) (e.g., RV steel supports, NST, Lubrite® lubricant, etc).

The staff plans to add new SRP-SLR further evaluation (FE) sections 3.5.2.2.2.7 and 3.5.3.2.2.7 and associated new SRP-SLR Table 3.5.1 and GALL-SLR aging management review (AMR) line items to provide further evaluation guidance and AMR line items in the SLR guidance documents to address irradiation aging effects for steel supports and related non-concrete structural components located in the vicinity of the reactor vessel. The staff plans to include at least one acceptable method for estimating fluence and gamma dose, and for evaluating the aging effect of loss of fracture toughness due to irradiation embrittlement for steel structural support components. The staff provided a summary of the initial proposed draft of the further evaluation. NEI requested a future public meeting with the staff specifically on this topic.

AMP XI.E7: Insulators (ML20049H347)

NEI proposed to add polymer high-voltage (HV) insulators to the scope and program elements of GALL-SLR AMP XI.E7. The current AMP addresses porcelain insulators, however, polymer insulators have been utilized in some nuclear plant sites and should be addressed accordingly. Polymer HV insulators include different material/environment and aging effects not previously considered in GALL-SLR and GALL-SRP.

The staff may also include toughened glass insulators in this AMP, and will expand the scope of this AMP to include medium voltage insulators.

AMPs XI.E3A/B/C: Insulation for Inaccessible Cables (ML20049H729)

NEI proposed to add inspections of manholes with water level monitoring and alarms that result in consistent, subsequent pump out of accumulated water prior to wetting or submergence of cables at least once every five years, as well as inspection of manholes following event-driven occurrences such as heavy rain, rapid thawing of ice and snow, or flooding when water level monitoring indicates rising water levels.

The staff will revise language in the “Preventive Actions” element in these programs.

Table 3.5-1 Revisions (ML20049H360 and ML20049H361)

NEI proposed to revise NUREG-2191 and NUREG-2192 to replace plant-specific programs with current AMPs to address aging in structures.

The staff provided a markup of NUREG-2191 Chapters II and III and NUREG-2192 Chapter 3.5 to reflect the revisions.

AMP X.M2: Neutron Fluence Monitoring (ML20049H346)

NEI proposed to revise this program to address the adequacy of RG 1.190 for extended beltline calculations.

The staff proposed revisions to Element 6, “Acceptance Criteria” to discuss recent staff review approaches for extended beltline and reactor vessel internals fluence calculations.

AMP XI.M33: Selective Leaching ML20049H353 and ML20049H354

NEI proposed to revise this program to recommend a technical justification for using the extent of inspections in the GALL-SLR AMP when inspections during initial license renewal were not consistent with GALL Rev. 2 guidance.

The staff proposed to add a paragraph to program Element 4, “Detection of Aging Effects,” to clarify the extent of inspections when initial license renewal inspections were not consistent with Rev. 2 of GALL.

The staff also proposed to correct the last sentence of program Element 6, “Acceptance Criteria,” to cite criterion (d) instead of criterion (c).

However, after discussion of the activities of NEI’s Selective Leaching Task Force, it was decided that revisions to XI.M33 will be placed on hold until further progress is made by the Task Force.

AMP XI.S1: ASME, Section XI, Subsection IWE (ML20050Q578)

NEI proposed to revise program Elements 3 & 4 to include language to perform fatigue waiver analysis to demonstrate that cracking due to cyclic loading is not an aging effect, as an alternative to surface examinations or Appendix J leak rate tests for containment components subject to cyclic loading with no fatigue analysis credited in its current licensing basis (CLB).

The staff does not see a viable path to incorporate the recommended language within AMP XI.S1.

The staff believes that NEI’s proposed revision is a TLAA-type analysis to be specified in an AMP element, which is inconsistent with the staff position on acceptance criteria for AMP elements in SRP-SLR Appendix A in order to meet requirements for managing aging effects pursuant to 10 CFR 54.21(a)(3). This analysis would not be credited in the CLB at the time of SLRA submittal, and therefore does not meet Criterion 6 of the definition of a TLAA in 10 CFR 54.3 (i.e., the analysis should be contained or incorporated by reference in the CLB, reason for criterion is to avoid backfit situations during license renewal).

If an applicant has performed a fatigue analysis or fatigue analysis waiver analysis as part of its CLB, then analysis would be dispositioned in the SLRA as a TLAA, pursuant to 10 CFR 54.21(c), guidance for which is provided in SRP-SLR Section 4.6. If a fatigue analysis or fatigue waiver analysis is not part of an applicant’s CLB and a fatigue waiver is requested, the request would have to be identified as the technical justification for an exception to the AMP guidance when it is submitted and the staff would review the analysis at that time, and there is precedent for this. Otherwise, the fatigue effects would have to be managed using condition monitoring methods through XI.S1.

AMP XI.S8: Protective Coatings (ML20049H358)

NEI proposed to revise the frequency of in-service coating inspections to allow the inspection of coatings meeting AMP XI.S8 Element 6 acceptance criteria to be performed on a frequency not to exceed six years and based on trending of the total amount of permitted degraded coatings. Coatings not meeting acceptance criteria will be evaluated by a qualified Nuclear Coating Specialist to determine the appropriate timing for repair, replacement, or removal.

The staff is considering the proposed revision.

Generic F-J Notes (ML20056C964)

NEI proposed revisions to reduce the number of AMR Standard F-J Notes in the SLR guidance. NEI provided proposed changes and the basis for the changes to the staff (ADAMS Accession No. ML20056C964). The staff is considering the proposed revisions.

Additional Discussion Topics

Representatives of the NRR's newly formed Embark Venture Studios (EVS) discussed the new organization, it's purpose and goals, and upcoming activities related to subsequent license renewal. More information will be shared at the next Lessons Learned Meeting on proposed improvements being considered for the SLR review process and risk-informing SLR reviews.

Action Items/Next Steps

The staff will prepare markups of NUREG-2191 and NUREG-2192 to identify the proposed revisions discussed above to include in the ISGs. The proposed revisions will be issued in one or more Interim Staff Guidance documents (ISGs) for use and comment. There will be a 30-day public comment period.

Attachments

- SLR Lessons Learned Meeting #3 - ML20049H344 (Package)
- Slides for SLR Lessons Learned Meeting #3 - ML20049H345
- SLR Change – AMP X.M2 - ML20049H346
- SLR Change – AMP XI.E7 - ML20049H347
- SLR Change – AMP XI.M2 - ML20049H348
- SLR Change – AMP XI.M12 - ML20049H349
- SLR Change – AMP XI.M16A – ML20049H350
- SLR Change – AMP XI.M21A - ML20049H352
- SLR Change – AMP XI.M33 - ML20049H353
- SLR Change – AMP XI.M33 - ML20049H354
- SLR Change – AMP XI.M42 - ML20049H355
- SLR Change – AMP XI.M42 - ML20049H357
- SLR Change – Draft FE 3.5.2.2.2.7 - ML20049H359
- SLR Change - Markup of GALL Structural Chapters II and III - ML20049H360
- SLR Change - Markup of SRP Structural Chapter 3.5 - ML20049H361
- SLR Change – AMPs XI.E3A/B/C - ML20049H729
- Meeting Notice - ML20050D439
- NEI Writeup – AMP XI.S1 – ML20050Q578
- NEI Writeup – AMP XI.S8 – ML20049H358
- F-J Notes – ML20056C964

Lessons Learned Public Meeting:

List of Meeting Attendees

February 20, 2020

Eric Oesterle	NRC
William Burton	NRC
Chris Earls	NEI
Eric Blocher	Dominion
Paul Aitken	Dominion
Mike Gallagher	Exelon
Lori Hekking	Duke Energy
Daniel Roberts	Duke Energy
Hope Alexander	PSEG
Pete Donahue	TVA
Angela Buford	NRC
Alex Chereskin	NRC
Sam Cuadrado	NRC
William Gardner	NRC
Lauren Gibson	NRC
Allen Hiser	NRC
Scott Krepel	NRC
Jim Medoff	NRC
Seung Min	NRC
Duc Nguyen	NRC
Leslie Terry	NRC
George Thomas	NRC