



Draft Generic Aging Lessons Learned (GALL) Report and Standard Review Plan (SRP) for Subsequent License Renewal (SLR)

Mechanical and Electrical Aging Management Programs (AMPs)

Office of Nuclear Reactor Regulation
Division of License Renewal

June 1, 2016

Agenda

- Opening Remarks
- Comments on Electrical and Mechanical Sections
 - Discussion will mostly focus on comments that were partially accepted or not accepted
 - The final disposition of all comments received on the draft SLR guidance documents by February 29, 2016, will be documented in a technical basis NUREG

Agenda

| Time | Topic |
|-------------------|---|
| 08:00AM - 08:15AM | Opening Remarks |
| 08:15AM - 9:45AM | <ul style="list-style-type: none"> • Long-Term Loss of Material • Aging Management Review (AMR) Line Item Changes to Address Revised Air Definitions • Updates to Acceptance Criteria and Corrective Actions Program Elements for Projected Degradation • Changes to aging management program (AMP) XI.M36 and XI.M38 to address industry comment on surface examinations • Available operating experience associated with inspection results for stainless steel and nickel alloy components exposed to treated water and treated borated water |
| 09:45AM - 10:00AM | Break |
| 10:00AM - 10:30AM | <ul style="list-style-type: none"> • Draft GALL-SLR Report AMP X.M1, Fatigue Monitoring |
| 10:30AM - 11:30AM | <ul style="list-style-type: none"> • Draft GALL-SLR Report AMP XI.M5, BWR Feedwater Nozzles • Draft GALL-SLR Report AMP XI.M11B, Cracking of Nickel-Alloy Components and Loss of Material Due to Boric Acid-Induced Corrosion in Reactor Coolant Pressure Boundary Components (Pressurized Water Reactors Only) |
| 11:30AM - 12:30PM | Lunch |

Agenda

| <i>Time</i> | <i>Topic</i> |
|--------------------|--|
| 11:30AM - 12:30PM | Lunch |
| 12:30PM - 01:00PM | <ul style="list-style-type: none">• Draft GALL-SLR Report AMP XI.M31, Reactor Vessel Material Surveillance |
| 01:00PM - 03:00PM | <ul style="list-style-type: none">• Draft GALL-SLR Report AMPs XI.E3B, Electrical Insulation for Inaccessible Instrument and Control Cables not subject to 10 CFR 50.49 EQ Requirements, and XI.E3C, Electrical Insulation for Inaccessible Low Voltage Power Cables not subject to 10 CFR 50.49 EQ Requirements – Revised to Sampling-Based AMPs• Draft GALL-SLR Report AMP XI.E6, Electrical Cable Connections – One-Time Inspections• Draft GALL-SLR Report AMP X.E1, Electrical Qualification (EQ) of Electric Components – Clarifications and Alignment of Expectations |
| 03:00PM - 03:15PM | Closing Remarks Adjourn |



Mechanical Balance-of-Plant Sections

**Office of Nuclear Reactor Regulation
Division of License Renewal
June 1, 2016**

Attachment 2: Comment No. 3

Long-Term Loss of Material (LTLom)

Industry Comment

- Delete LTLom term
- Augmented inspections would be based on a review of Operating Experience (OE)
- Revise Recurring Internal Corrosion (RIC) SRP-SLR further evaluation section to address LTLom

Staff Response – Not Accepted

- Staff seeks further discussion

Attachment 2: Comment No. 3

Technical Basis

- LTLom is unique – 80 years versus 40 years design for corrosion allowance
- LTLom not cited for water systems with corrosion inhibitors
- LTLom can be addressed by wall thickness measurements conducted in 50 – 60 year time frame
- RIC is based on 50% or through-wall loss of material
- OE might not reveal uniform loss of material if there is no through-wall leaks

Summary of Staff Recommendations

- No further changes beyond those proposed in the SLR Supplement

Attachment 2: Comment Nos. 37 – 40

Aging Management Review (AMR) Line Item Changes to Address Revised Air Definitions

Industry Comment

Delete the following terms and replace with air-indoor uncontrolled:

- Air with metal temperatures up to 288°C
- Air with steam and water leakage
- Air with reactor coolant leakage
- Reactor coolant when associated with line items R-61 and R-74

Staff Response – Accepted with modifications

- Staff seeks further discussion

Technical Basis

- Detailed technical basis will be provided with response to comments

Attachment 2: Comment Nos. 37 – 40

Summary of Staff Recommendations

- Air with metal temperature up to 288°C (550°F) replaced with Any environment
 - Cyclic loading is not dependent on the specific air environment
 - R-19: Pressurizer integral support; cracking due to cyclic loading

- Air with steam or water leakage replaced with Any air environment (except air-dry internal), condensation
 - Steam or water leakage could occur anywhere in the plant
 - A-03, A-04, AP-122, E-02, E-03, S-02, S-03: Closure bolting; loss of material, cracking (SCC, cyclic loading)

Attachment 2: Comment Nos. 37 – 40

Summary of Staff Recommendations, cont.

- Air with reactor coolant leakage replaced with Air-indoor uncontrolled
 - Reactor coolant leakage would primarily only occur in containment, which is an uncontrolled environment
 - RP-51, RP-165, RP-201: Reactor vessel closure flange assembly; loss of material, cumulative fatigue damage, cracking
 - R-78, R-79, R-80: Control rod drive bolting; loss of material, loss of preload, cracking

- Air with reactor coolant leakage (internal), reactor coolant replaced with Air-indoor uncontrolled, reactor coolant leakage
 - Components are located in containment
 - Components could be exposed to an air environment or reactor coolant leakage
 - R-61, R-74: Vessel flange leak detection line, cracking (SCC, IGSCC)

Projected Degradation

Updates to Acceptance Criteria and Corrective Action Program Elements for Projected Degradation

Industry Comment – Not applicable

Staff Response – Staff seeks discussion

Technical Basis

- AMPs are inconsistent in addressing acceptance criteria in relation to potential future degradation
- AMPs are inconsistent in regard to addressing associated corrective actions
- Not all AMPs will be revised (e.g., ASME Section XI, Flow Accelerated Corrosion)

Projected Degradation

Summary of Staff Recommendations

- One-time program with 100% inspection:
 - Project the degree of observed degradation, where practical, to the end of the subsequent period of extended operation
 - Applicant enters in corrective action program
- One-time program with sampling-based inspection:
 - Project the degree of observed degradation, where practical, to the end of the subsequent period of extended operation
 - AMP will recommend additional inspections when the acceptance criteria are not met
- Periodic program with 100% inspection:
 - Project the degree of observed degradation, where practical, to the end of the subsequent period of extended operation or the next scheduled inspection, whichever is shorter
 - Applicant enters in corrective action program

Projected Degradation

Summary of Staff Recommendations, cont.

- Periodic program with sampling-based inspection:
 - Project the degree of observed degradation, where practical, to the end of the subsequent period of extended operation or the next scheduled inspection, whichever is shorter
 - Depending on the potential consequence of not meeting the acceptance criteria or the periodicity of inspections (e.g., every 10 years versus every refueling outage) for the specific program, the “corrective action” program element should include recommendations related to additional inspections
- “Where practical”
 - Not all degradation is quantifiable
 - Qualitative acceptance criteria are allowed
 - Staff would not necessarily expect that a volumetric examination would be conducted after a recommended visual or surface exam
 - Staff will document this in the GALL-SLR Basis document

Attachment 4: Comment Nos. XI.M36-3 and XI.M38-4

AMP XI.M36 & XI.M38 Surface Examinations

Industry Comment

- XI.M36-3: remove recommendation for periodic surface examinations
- XI.M38-4: remove recommendation for periodic surface examinations

Staff Response – Not Accepted; however, recommendation was modified

- Modification allows one of three options:
 - Surface examination
 - VT-1 (including nonCode components)
 - Basis provided in a subsequent license renewal application (SLRA) for visual inspection technique will be capable of detecting a crack prior to the crack challenging the structural integrity or intended function of the component.
 - The AMPs deliberately associate the term “demonstrated” with this option.

Attachment 4: Comment Nos. XI.M36-3 and XI.M38-4

Technical Basis

- The staff recognizes that AMPs XI.M36 and XI.M38 were based upon visual inspections principally conducted by system engineers and craft, respectively.
- Cracks might not be detected by visual techniques, particularly system engineer walkdowns.
- VT-1 inspections ensure certain inspection parameters are met (e.g., lighting, distance).
- The inspections for cracking are sampling-based (e.g., 25 inspections).
- Third option: the term “demonstrated” means that positive evidence exists that cracks were detected by visual examination.

QUESTIONS



AMP X.M1, Fatigue Monitoring

**Office of Nuclear Reactor Regulation
Division of License Renewal
June 1, 2016**

Attachment 3: AMP X.M1 - #2

Industry Comment (Tracked as # 16-002)

Program Description, first paragraph, second sentence: “component locations in the reactor coolant pressure boundary....” It must be clearly stated here that only Class 1 components and piping are being addressed by this requirement.

Proposed Markup: “*Examples of cycle-based fatigue analyses. . . include but are not limited to: (a) for ~~specific~~ **Class 1** mechanical of structural components; (b) fatigue analysis calculations for assessing . . .*”

Basis for Comment: Note that NUREG-1800 Rev 2 states in Section 4.3.2.1.3 “Environmental Fatigue Calculations for Code Class 1 Components”, so X.M1 should only apply to Class 1 components. The program should state that reactor pressure vessel internals do not fall under this requirement.

Resolution of #16-002

Staff Response – Not accepted

Technical Basis

Comment is on clause (a) in the second sentence of the program description. Some LRAs in the past have identified that some reactor internal components or some non-ASME Code Class 1 mechanical components have been analyzed with ASME design basis CUF analyses. Therefore, design basis CUF analyses for the CLB may not be limited only to those for components in the RCPB (Class 1 boundary). The AMP is perfectly acceptable for non-RCPB components with CUF calculations.

Summary of Staff Recommendations

Proposed changes to the referenced sentence will not be implemented.

Attachment 3: AMP X.M1

Industry Comment (Tracked as # 16-003)

Program Description, third paragraph: Clarify that the second aspect of the program described includes stress-based fatigue monitoring (SBFM), in which actual plant operating conditions (fluid temperatures, pressures, and flow rates) are monitored.

Proposed Markup: “*For the latter . . . design or analysis-specific limit. This option may include stress-based fatigue monitoring, in which operating temperatures, pressures, and other parameters are monitored and used to determine the effects of actual operating transients on the cumulative CUF and CUF_{en} for the analyzed components. This option periodically compares cumulative CUF and CUF_{en} to the limit of 1.0. Technical specification requirements. . . .*”

Comment Basis: Cycle-based and stress-based fatigue monitoring methods are currently in use at many plants

Resolution of #16-003 (Cont.)

Staff Response – Partially accepted

Technical Basis

The staff agrees that stress based monitoring activities were approved as part of Fatigue Monitoring Programs for some past license renewal applicants. Therefore, the comments seems reasonable for further editing of the AMP and editing of the further evaluation sections in the SRP-SLR report to refer that plant specific CUF methods are one method of performing CUF calculations.

Summary of Staff Recommendations

AMP and FE sections will be amended to refer to stress-based calculation methods. However, these types of methods are based on plant-specific methods. Therefore, if stress-based calculation methods are used in the CLB, the amended FE sections will remind the applicants to formally define, discuss and disposition their stress-based CUF methods and results on a case-by-case basis. Revised wording may not be exactly as proposed by NEI.

Attachment 3: X.M1 - #4

Industry Comment (Tracked as #16-004)

Add a sentence on stress based for the fourth paragraph of the program description (similar to comment for Issue #16-003).

Proposed Markup: *“In order not to exceed the design limit on CUF, the AMP monitors is bounded by the design basis conditions. **As an alternative to monitoring transient cycles, the AMP may also directly monitor the critical thermal and pressure transient parameters (temperature, pressure, and flow rate) to determine the actual severity of each event and to compute the resulting fatigue usage affecting specific component locations.**”*

Comment Basis: This statement will make this paragraph consistent with the revised third paragraph amended as described above. . . .

Staff Response – Partially accepted

Resolution of #16-004

Technical Basis

Staff agrees to incorporate a modified version of the proposed edits by NEI. However, staff does not want to restrict cycle based monitoring activities only to the monitoring pressure or thermal transients, as other types of transients may be included the assumptions for a given fatigue parameter calculation. Thus, the staff will implement a modified form of the proposed sentence.

Summary of Staff Recommendations

The staff will add the following sentence: *“In order not to exceed the design limit on CUF, the AMP may also directly monitor applicable design transient parameters (e.g., temperatures, pressures, displacements, strains, flow rates, etc.) to determine the actual severity of each event and to compute the resulting fatigue usage affecting specific component locations.”*

Attachment 3: AMP X.M1 - #5

Industry Comment (Tracked as #16-005)

Program Description, fourth paragraph: Delete, “Note that other values may be used as CUF design limits, for example, values used for high energy line break (HELB) considerations.”

Proposed Markup: “... subjected to cyclic stresses. Crack initiation is assumed to begin in a mechanical or structural component when the CUF at a point on or in the component reaches the value of 1.0, which is the ASME Code Section III design limit on CUF values. ~~(Note that other values may be used as CUF design limits, for example, values used for high energy line break considerations.)~~”

Comment Basis: EPRI Report 1022873 . . . states that “. . . .“consideration of fatigue usage by itself is not a reliable approach to predict crack initiation or leakage.” As a result, the use of HELB values as a CUF design limit should not be considered and the statement should be deleted . . .

Resolution of #16-005

Staff Response – Not accepted

Technical Basis

Specifically, an applicant should be monitoring against the design limits for each type of analysis that is within the scope of this type of AMP. For example, for components in HELB assessments in the FSAR, the analyses may compare the CUF for a given component to an acceptance criteria (e.g., 0.1) that is different from design limit of 1.0 in the ASME design basis CUF calculations for the same component. Thus, if used for monitoring of a component in the HELB analysis, the applicant would need to monitor any changes to the CUF values against a design limit of 0.1, and not 1.0. The EPRI report referenced as part of the basis in the NEI comment may or may not be applicable to an applicant's CLB and therefore cannot be accepted as a basis for deleting the referenced Note statement.

Summary of Staff Recommendations

Proposed changes to the referenced sentence will not be implemented

Attachment 3: AMP X.M1

Industry Comment (Tracked as #16-006)

Program Description, fifth paragraph: Need to include a functional description of methods for identifying “plant-specific component locations.”

Proposed Markup: *To identify the “plant-specific component location” an appropriate screening analysis can be performed. This screening analysis can consist of a grouping of Class 1 piping and components that have approximately the same structural properties and experience approximately the same thermal transients that can cause material fatigue. An appropriate fatigue analysis can be performed on the component or piping location representative of the group. The plant-specific component that is more limiting than the locations identified in NUREG/CR-6260 can be identified by reviewing the results of the fatigue analysis of the individual groups.*

Comment Basis:it is not apparent to industry how one identifies the limiting location that satisfies the intent of X.M1.

Resolution of #16-006

Staff Response – Not accepted

Technical Basis

In regards to environmentally-assisted fatigue, the purpose of this AMP is to monitor the number of occurrences and severity of the applicable design transients used in fatigue parameter analyses. The AMP does not serve the purpose of providing a recommended methodology for screening plant-specific component locations for environmentally-assisted fatigue analyses. Instead, as has been done for past LRAs, the applicants should continue to provide their screening bases for plant-specific component locations in their evaluations of the TLAAAs for addressing the effects of environmentally-assisted fatigue. The updated guidelines in SRP-SLR Section 4.3 address how this is done.

Summary of Staff Recommendations

Proposed changes to the referenced sentence will not be implemented.

Attachment 3: AMP X.M1

Industry Comment (Tracked as #16-008)

Program Description, third and fourth paragraph: Add wording “analysis assumptions controlling” as indicated in markup.

Proposed Markup: (3rd P) - The AMP monitors and tracks *analysis assumptions controlling* the number of occurrences and severity of critical . . . (4th P) The AMP monitors and tracks the *analysis assumptions controlling* number of occurrences and severity of each of the critical thermal and pressure transients for the selected components

Basis for Comment: Note that on page X.M1-2, the statements describing monitoring of (Appendix-L) Flaw Tolerance and (Appendices A/C) fracture mechanics analyses are very specific and do not account for situations where monitoring between inspections is simply time-based, and not directly based on monitoring of transient cycles at the affected component.

Staff Response – Not accepted

Resolution of #16-008



Technical Basis

The staff has rejected similar arguments in past LRA reviews. For time-dependent flaw evaluations used to set ISI intervals, the time between inspections has no relationship to the time associated with the number of cycles assumed in the analyses. The selection of the ISI interval does not serve as a valid basis for reducing the term of design life or period associated with time-dependent parameter use in the time-dependent analysis. Instead, the selection of the period associated with the ISI interval is part of a safety determination made by the applicant, and therefore relates to conformance with safety determination criterion (Criterion 4) in 10 CFR 54.3(a); it has no relationship to the time-dependent parameter criterion (#3) in §54.3(a).

Summary of Staff Recommendations

Proposed changes to the referenced sentence will not be implemented

Attachment 3: AMP X.M1

Industry Comment (Tracked as #16-009)

Scope of Program, second paragraph: States, “This sample set includes the locations identified in NUREG/CR–6260 and additional plant- specific component locations if more limiting than those considered in NUREG/CR–6260.” Some locations in NUREG/CR-6260 may have projected $CUF/CUF_{en} \ll 0.5$. If this is the case, a plant should not have to monitor an SC with projected 80-year $CUF/ CUF_{en} < 0.5$.

Recommended Markup: *... This sample set includes the locations identified in NUREG/CR–6260 with projected 80- year $CUF/ CUF_{en} \geq 0.5$, and additional plant-specific component locations in the reactor coolant ...*

Comment Basis: Continuously monitoring and updating detailed fatigue analyses for NUREG/CR-6260 locations that have projected 80 year $CUF/ CUF_{en} < 0.5$ is not technically justified, while imposing additional costs on utilities for engineering analysis.

Resolution of #16-009

Staff Response – Not accepted

Technical Basis

The AMP does not impose continuous monitoring or continuous updates of CUF or CUF_{en} calculations. In addition, the criteria in GSI-166 and GSI-190 recommended monitoring of component locations for given NSSS designs in NUREG/CR-6260 and potentially more limiting locations than those identified in the report for the specific NSSS design. This has not changed from the manner that this has been processed in previous applications. Again selection of components in the analysis should be defined and justified in the applicable TLAA, not the AMP.

Summary of Staff Recommendations

Recommended changes to the referenced sentence will not be implemented

Attachment 3: AMP X.M1

Industry Comment (Tracked as #16-010)

Parameters Monitored or Inspected, third paragraph: Revise first sentence as indicated in markup.

Proposed Markup: “*The program monitors all applicable plant transients that cause cyclic strains and **are significant contributors** ~~contribute~~ to fatigue, as specified in the fatigue analyses, and **monitors or validates** appropriate environmental parameters that contribute to F_{en} values.*”

Comment Basis: While “fatigue-significant” may have been intended by the Current GALL-SLR sentence, it is not certain as the phrase “contribute to fatigue” seems absolute. This interpretation would result in undue efforts on the utilities part to monitor transients that have a miniscule contribution to fatigue

Staff Response – Partially accepted

- Proposed changes to the first clause in the sentence are not accepted

Resolution of #16-010

Technical Basis

The technical specifications may require monitoring a specific transient, even if it is only a small contributor to the overall CUF calculations. Also, for components with high CUF values the basis may not hold true even if the transient is a small contributor to the fatigue calculations. Thus, the staff cannot accept the basis for changing the first clause in the referenced sentence. The change in the second clause of the reference sentence appears to be acceptable for implementation.

Summary of Staff Recommendations

The staff will only implement the proposed change to second clause in the referenced sentence

Attachment 3: AMP X.M1

Industry Comment (Tracked as #16-011)

Parameters Monitored or Inspected, third paragraph: This program should not have actual plant water chemistry as a parameter monitored. A similar change should be made to the other elements which impose the plant water chemistry monitoring requirement.

Proposed Markup: Refer to Comment 10 on X.M1 in attachment 3 of the NEI comment letter on SLR guidance documents.

Comment Basis: As stated on page X.M1-2, “this program relies on . . . AMP XI.M2, “Water Chemistry,” to provide monitoring of appropriate environmental parameters”. Therefore if Water Chemistry AMP is credited then all monitoring should be in the Water Chemistry AMP not in the Cyclic Load Monitoring AMP.

Staff Response – Partially accepted

Resolution of #16-011

Technical Basis

The staff agrees that the monitoring of chemistry parameters providing inputs to the CUF_{en} calculations could be done through implementation of applicant's water chemistry program (WCP). However, there would need to be some owner administrative and confirmatory controls in the Fatigue Monitoring Program (FMP) to take inputs from the WCP and incorporate them into the FMP. Therefore, the staff only agrees to implement an alternative modification of the sentence. Some changes to elements 8 and 9 would be needed as well.

Resolution of #16-011 (Cont.)

Summary of Staff Recommendations

Program Element No. 3 will now be modified to read: “The number of occurrences and the severity of the plant transients, ~~and actual water chemistry~~ that contribute to the fatigue analyses for each component are monitored. **For environmentally-assisted fatigue calculations, chemistry parameters that provide inputs to F_{en} factors used in the CUF_{en} calculations are monitored and tracked in accordance with this program or alternatively through implementation of the applicant’s water chemistry program. More detailed monitoring . . .”**

The following new paragraph will be added at the end of Program Element 8, “Confirmation Process, and Program Element 9, “Administrative Controls”: **For water chemistry parameters inputs to environmentally-assisted fatigue calculations that are monitored by the water chemistry program, the program includes administrative and confirmatory controls to ensure that any changes in the water chemistry parameters are factored into the applicable CUF_{en} calculations.**

Attachment 3: AMP X.M1

Industry Comment (Tracked as #16-012)

Detection of Aging Effects, fourth paragraph: Revise first sentence as indicated in the markup.

Proposed Markup: *The program uses applicant defined activities or methods to track the number of occurrences and severity of transients, ~~and water chemistry conditions,~~ and any applicable plant operating conditions used to inform updated evaluations of the fatigue analyses.*

Comment Basis: The current GALL-SLR sentence should be revised as proposed to more closely align it with the program description section of the AMP, paragraph 3, which clearly allows for the monitoring of plant operating conditions.

Staff Response – Partially accepted

Resolution of #16-012

Technical Basis

The staff agrees that changes are needed but has decided to implement a modified version of the sentence.

Summary of Staff Recommendations

The referenced sentence will be modified to read: “The program uses applicant defined activities or methods to track the number of occurrences and severity of **design basis** transients, ~~and water chemistry conditions,~~ **and any applicable plant operating conditions used to inform updated evaluations of the fatigue analyses. Monitoring of water chemistry parameters that are inputs to environmentally-assisted fatigue calculations may be performed in accordance with this AMP or an applicant’s water chemistry program.”**

See resolution of #16-011 for changes to Elements 8 and 9.

Attachment 3: AMP X.M1 - #13

Industry Comment (Tracked as #16-013)

Monitoring and Trending, fifth paragraph: Add the sentence in the markup for clarification.

Proposed Markup: ~~Monitoring of water chemistry conditions is used to ensure calculated F_{en} values remain valid.~~ *Monitoring of actual plant operating conditions is used to inform updated evaluations of the fatigue analyses to ensure they continue to meet the design or analysis-specific limit. Trending is performed . . .*

Comment Basis: The current GALL-SLR sentence above should be revised as proposed to more closely align it the program description section of the AMP, paragraph 3, which clearly allows for the monitoring of plant operating conditions.

Staff Response – Partially accepted

Resolution of #16-013

Technical Basis

The staff agrees that changes are needed but similar to the resolution of comment #16-012, but the staff has decided to implement a modified version of the sentence.

Summary of Staff Recommendations

Second sentence in Element 5 will be modified to read: ~~Monitoring of water chemistry conditions is used to plant ensure calculated Fen values remain valid.~~ **plant operating conditions in accordance with this program or water chemistry parameters in accordance with this program or the water chemistry program (i.e., as inputs for environmentally-assisted fatigue calculations or potentially for other plant-specific fatigue parameter evaluations) is used to either verify the validity of the evaluations against their applicable design or analysis-specific limits or else to update the evaluations or take appropriate corrective actions, as necessary.**

QUESTIONS

**Industry Presentation on AMPs
XI.M5, BWR Feedwater Nozzles and
XI.M11B, Cracking of Nickel-Alloy
Components and Loss of Material**

QUESTIONS

BREAK



AMP XI.M31, Reactor Vessel Material Surveillance

**Office of Nuclear Reactor Regulation
Division of Engineering
June 1, 2016**

Attachment 5: AMP XI.M31

Dosimetry Monitoring

GALL-SLR states, “If surveillance capsules are not withdrawn during the subsequent PEO, provisions are made to perform dosimetry monitoring.”

Proposal: Revision to state that the presence of an in-vessel standby capsule, coupled with use of an approved fluence prediction model (RG 1.190) satisfies the need for dosimetry and fluence monitoring.

Staff Response – Accepted

Summary of Staff Recommendations

- If the standby capsule has been in storage and will be returned to the vessel, the condition of the contents must be acceptable to perform continued monitoring
- Additional means of dosimetry monitoring such as ex-vessel monitoring

Attachment 5: AMP XI.M31

Industry Comment (Tracked as #16-013)

10^{17} n/cm² comes from Appendix H – RVs with this fluence need a surveillance program. TLR-RES/DE/CIB-2013-01 offers an alternate limit (the mean value of ΔT_{30} using ETC acceptable to the staff is less than 25°F at EOL). Recommend adding “or as recommended in TLR-RES/DE/CIB-2013-01.”

Staff Response – Not accepted

Summary of Staff Recommendations

- NRC Regulatory Issue Summary 2014-11, “Information on Licensing Applications for Fracture Toughness Requirements for Ferritic Reactor Coolant Pressure Boundary Components.” Oct. 2014
- “Therefore, the beltline definition in 10 CFR Part 50, Appendix G is applicable to all reactor vessel ferritic materials with projected neutron fluence values greater than 1×10^{17} n/cm² ($E > 1$ MeV), and this fluence threshold remains applicable for the design life as well as throughout the licensed operating period.”

QUESTIONS



Electrical AMPs

**Office of Nuclear Reactor Regulation
Division of License Renewal
June 1, 2016**

Attachment 7: AMPs XI.E3B, XI.E3C

Revised to Sampling-Based AMPs

Industry Comment

Little known significant operating experience that warrants performing preventive actions or condition monitoring activities on submerged I&C cables.

Recommend a plant specific AMP for susceptible insulation materials or local operating experience.

Staff Response – Partially accepted

Technical Basis

Cables in submerged environments for which they were not designed for an extended period of time need to be age managed (on a sampling basis) to gain reasonable assurance for performing the intended functions

Attachment 7: AMPs XI.E3B, XI.E3C



Summary of Staff Recommendations

- Ten-year visual inspection for submergence
- One-time testing on a sampling basis of cables exposed to submergence
- Credit can be taken for tests/surveillance performed on similar cables

Attachment 7: AMP XI.E6

One-Time Inspections

Industry Comment

Little known significant operating experience that warrants performing periodic condition monitoring activities on electrical cable connections.

Recommend a plant specific AMP for local operating experience.

Recommend using:

One-time assessment prior to subsequent PEO

Based on the information gathered, further periodic activities can be determined.

Staff Response – Partially accepted

- Staff accepted one-time test in lieu of periodic test

Attachment 7: AMP XI.E6

One-Time Inspections

Technical Basis

Site-specific operating experience evaluation is a reliable measure of actual aging effects experienced and observed

Summary of Staff Recommendations

- Staff reverted to initial one-time test on a sampling basis (periodic visual inspection can be done as an alternative)
- Results of initial test evaluated to determine if periodic testing is warranted

Attachment 7: AMP X.E1

Clarifications and Alignment of Expectations

Industry Comment

Clarify that the SLR AMP X.E1 Report is limited to passive components only. The intent of X.E1 is to manage cable and connection insulation material. Recommend defining EQ electrical equipment in the GALL Report to mean cable and connection insulation material (See SLR SRP Section 2.5.3). Avoids conflicts with Regulatory Guide 1.89 and 10 CFR 50.49 attributes for active equipment.

Staff Response – Partially accepted

Attachment 7: AMP X.E1

Technical Basis

- TLAA 4.4 TLAA AMP X.E1 are applicable to EQ electrical equipment
- 10 CFR 54.21(a)(1)(i) and 10 CFR 54.21(c)
- The adverse localized environment (ALE) evaluation is not apart of the EQ program - 10 CFR 50.49

Summary of Staff Recommendations

- Clarified the added ALE visual inspection evaluation is limited to passive long lived EQ equipment.

QUESTIONS

CLOSING REMARKS