

ONS SLRA: Breakout Questions

SLRA Section 4.6, “Containment Liner Plate, Metal Containments, and Penetration Fatigue Analyses”

TLAA: 4.6.1, 4.6.2, 4.6.3, A4.6, and 3.5.2.2.1.5

TRP: 146

Question Number	SLRA Section	SLRA Page	Background / Issue (As applicable/needed)	Discussion Question / Request
1	4.6.1, A4.6.1, 4.6.3, A4.6.3	4-100, 4-101, A-65, A-66	<p><u>Clarify change in TLAA disposition between first LR and SLRA:</u> From review of NUREG-1723 (SER for ONS First LR) and the referenced SLRA, the staff noted that the TLAA disposition for containment liner plate and penetrations changed from 10 CFR 54.21(c)(1)(i) to (c)(1)(iii).</p>	<p>a) <i>[This question is not intended to change any disposition, but for the benefit of the staff's understanding.]</i> Explain the rationale that triggered the change in TLAA disposition for containment liner plate and penetrations fatigue from (c)(1)(i) in first LR to (c)(1)(iii) in SLRA. What fatigue parameter may potentially be exceeded in 80 years of operation to be monitored by a TLAA AMP?</p>
2	4.6.1, A4.6.1, 4.6.3, A4.6.3	4-100, 4-101, A-65, AA-66	<p><u>Clarify TLAA Evaluation statements for containment liner plate and containment penetrations and related UFSAR statements:</u> UFSAR Section 3.8.1.5.3 on pages 3.8-30 and 3.8.-32 states, in part, that: “All penetrations are reviewed for a conservative number of cycles to be expected during the plant life.” It is not clear if fatigue TLAAAs exist for all penetrations as implied in the UFSAR.</p>	<p>a) Clarify if fatigue TLAAAs exist for all containment penetrations as apparently implied in the reference UFSAR Section 3.8.1.5.3. If so, are they addressed in the SLRA apart from the main steam and main feedwater piping penetrations evaluated in Section 4.6.3, and where?</p>

			<p>SLRA section 4.6.3 addresses TLAAAs for only main steam and main feedwater containment penetrations.</p> <p>The SLRA under TLAA disposition for the containment liner plate states, in part: “As described in UFSAR Section 3.8.1.5.3, the only portions of the liner plate that contain fatigue analysis are those thickened portions at the penetrations.” Similar statement is made in UFSAR supplement for the TLAA in SLRA Section A4.6.1.</p> <p>The staff understands that liner plate is thickened at the penetrations to address stress concentrations at discontinuities. However, the staff notes from review of UFSAR Section 3.8.1.5.3 (p 3.8.1-30 and -31) that the fatigue loads stated therein where considered in the design of the liner plate (not only the thickened liner plate), which appear inconsistent with the statement in the SLRA.</p> <p>Also, it is not clear what components (e.g., penetration sleeves, penetration bellows, welds, dissimilar metal welds) of the main steam and feedwater penetrations were evaluated in the SLRA 4.6.3 TLAA.</p>	<p>b) Clarify or explain the referenced statement in the SLRA, with regard to fatigue analysis are only for thickened portions of the liner, which appears inconsistent with the description in the UFSAR.</p> <p>c) Clarify whether the fatigue evaluation of the concentric penetration sleeves (design to ASME Section III per UFSAR) is included with that of the liner plate (4.6.1) or that of the penetrations (4.6.3). Clarify what specific penetration components (e.g., penetration sleeves, penetration bellows, welds, dissimilar metal welds) were evaluated in the 4.6.3 TLAA.</p> <p>d) Clarify the materials used for the penetration sleeves and if it is same or equivalent as the A36 liner plate material. Clarify whether there are dissimilar metal welds (DMWs) or bellows.</p> <p>e) If DMWs exist, are they evaluated in the TLAAAs for</p>
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				the penetrations?. If not, how is the aging effect of fatigue cracking monitored for DMWs.
3	A4.6.1 A4.6.3	A-65, A-66	<p><u>TLAA FSAR Supplement Summary</u> <u>Description Issue:</u> 10 CFR 54.21(d) requires that the summary description of the evaluations of TLAAs in the FSAR Supplement is sufficiently comprehensive, such that later changes can be controlled by 10 CFR 50.59. Per SRP-SLR Section 4.6.2.2, the FSAR description should contain information associated with TLAA's regarding the basis for determining that the applicant has made the demonstration required by 10 CFR 54.21(c)(1) disposition. See example of expected FSAR supplement information description in SRP-SLR Table 4.6-1 for disposition under 10 CFR 54.21(c)(1)(iii).</p> <p>The UFSAR supplement summary description for the containment liner plate TLAA does not appear to describe how the Fatigue Monitoring Program manages the effects of fatigue for the containment liner plate and containment penetrations (what relevant transient cycles considered in the TLAA the program monitors and tracks to assure fatigue evaluation remains valid, what criteria is used to assess program effectiveness (fatigue parameters within what specified allowable limits or requires corrective</p>	a) Explain how ONS proposes to address the apparent deficiency (e.g., what specific parameters will be monitored against what and to what end) identified in the issue in the FSAR supplement summary descriptions in SLRA Sections A4.6.1 and A4.6.3 for the containment liner and containment penetrations fatigue TLAA's dispositioned in accordance with 10 CFR 54.21(c)(1)(iii). See example in SRP-SLR Table 4.6-1 for recommended information,

			actions), when and what corrective actions are triggered.	
4	Table 4.6.3-1, Table 4.3.1-1	4-102 4-54	<p><u>Clarify information presented in SLRA Table 4.6.3-1:</u></p> <p>a) Table 4.6.3-1 includes a column “Current Count⁽²⁾” of governing transients for the ONS Main Steam and Feedwater Containment Penetrations, but does not provide a date associated with the current count. The Table also includes a Refined Allowable cycles column.</p> <p>b) There appears to be an apparent discrepancy in the reported Current Count and Projected Cycles for 80 years between Table 4.6.3-1 and Table 4.3.1-1 for the total reactor trips transient (135 vs 122 and 194 vs 204 for current and projected respectively) obtained by the addition of transients 8A, 8B, 8C, and 8D in Table 4.3.1-1.</p> <p>c) Footnote 3 of Table 4.6.3-1 states: “These governing transients include seismic loads.” But the TLAA evaluation makes no mention of seismic loads in the TLAA evaluation and how many seismic cycles were considered. Also, Table 4.3.1-1 does not appear to include seismic as a transient that is monitored.</p> <p>d) It is no clear if transient cycles due to Loss of Feedwater to once through</p>	<p>a) Provide the date associated with the current count, clarify if it is as of 5/6/19 indicated in SLRA Table 4.3.1-1. Also, explain the “Refined Allowable Cycles” versus “40-Year Design Allowable Cycles” in Table 4.6.3-1.</p> <p>b) Clarify the discrepancy of reported current count and projected cycles between Table 4.6.3-1 and Table 4.3.1-1, and provide the correct cycles if determined to be in error.</p> <p>c) Explain how seismic load cycles were evaluated in the TLAA, and how many cycles were considered</p> <p>d) Explain why transient cycles due to loss of feedwater to once through steam generator is not included as an applicable transient for the main feedwater penetration TLAA evaluation.</p>

			<p>steam generators (17A, 17B) in Table 4.3.1-1 would be an applicable transient for the main feedwater penetration TLAA evaluation.</p> <p>e) It is not clear what the material for the containment main steam and main feedwater penetrations are?</p> <p>f) It is not clear what the source document of the reported "Refined Allowable Cycles" column in Table 4.6.3-1 is.</p>	<p>e) State the material specification (e.g., A36, A516) used for the main steam and main feedwater piping penetrations / penetration sleeves. Are all the containment penetrations of the same material?</p> <p>f) Identify the source document of the reported "Refined Allowable Cycles" column in Table 4.6.3-1 and provide on the ePortal.</p>
5	Table 3.5.1, item -027	3-1331	<p><u>Accounting AMR of containment pressure-retaining boundary components that have no CLB fatigue analysis with regard to managing cracking due to cyclic loading (AMR item 3.5.1-027):</u></p> <p>SLRA Table 3.5.1, in the Discussion column for item 3.5.1-027 states: "Not applicable. Cracking due to cyclic loading of the Containment liner and penetrations is a time-limited aging analysis (TLAA), as defined in 10 CFR 54.3. The evaluation of this TLAA is addressed in Section 4.6. The associated NUREG-2191 aging items are not used."</p> <p>SLRA Section 3.5.2.2.2.1.5 states that TLAA's for fatigue of the <i>containment liner plate and main feedwater and main steam penetrations</i> are addressed in SLRA Section 4.6. SLRA Section 3.5.2.2.2.1.5</p>	<p>[This question may overlap with TRP 41: ASME Section XI, Subsection IWE AMP and can be discussed in both TRPs 41 and 146]</p> <p>a) List the containment-pressure-retaining boundary components covered by SRP-SLR Table 3.5-1, item 027 (e.g., personnel airlock, equipment hatch, electrical penetration, penetration sleeves, penetration bellows, etc.) that are subject to cyclic loading but do not have a CLB fatigue analyses.</p>

		<p>does not address fatigue or fatigue waiver analyses of any other containment pressure-retaining boundary components other than those above, nor provides any further evaluation associated with SRP-SLR item 3.5.1-027 for containment pressure-retaining boundary components that do not have a CLB fatigue analysis.</p> <p>However, it is not clear how the other containment pressure-retaining boundary components subject to cyclic loading, but do not have a CLB fatigue analysis, covered by item 3.5.1-027 will be adequately managed for cracking due to cyclic loading.</p> <p><i>Note:</i> <i>The SRP-SLR and GALL-SLR provides guidance for addressing or accounting for cracking due to cyclic loading (where no CLB fatigue analysis exists) by any of the following ways:</i></p> <ul style="list-style-type: none"> <i>(i) By performing supplemental surface examinations (or alternate like E-VT1 examinations) (recommended in GALL-SLR AMP XI.S1)</i> <i>(ii) By crediting an appropriate Appendix J Type B leak rate test capable of detecting cracking) (recommended in GALL-SLR AMP XI.S1)</i> <i>(iii) By performing a fatigue waiver analysis (recommended in FE 3.5.2.2.2.1.5 associated with item 3.5.1-027 per SLR-ISG-2021-03-</i> 	<ul style="list-style-type: none"> b) Clarify if fatigue TLAAs exist for all containment penetrations as implied by c) Justify the non-applicability claim of SLRA Table 3.5.1, item 3.5.1-027, for each of these components. <p>OR</p> <p>Explain how cracking due to cyclic loading (cumulative fatigue damage) will be adequately managed for these components pursuant to 10 CFR 54.21(a)(3), and how do you plan to address them in the SLRA.</p> <p>(v)</p>
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6	<p>SLR-ONS-TLAA-0300 Rev 1, App B;</p> <p>SLRA 4.6</p>	4-102	<p><u><i>Related Document Requests for ePortal:</i></u> Provide the following documents on the ePortal:</p> <ol style="list-style-type: none"> 1) OSC-11500, Design Loads for Penetrations 25, 26, 27 & 28 (Main Steam and Feedwater) 2) Source document of the reported "Refined Allowable Cycles" column in SLRA Table 4.6.3-1 3) Design calculation(s) that includes the fatigue evaluation of (a) the containment liner plate and (b) containment penetrations. 	