Oconee SLRA: Breakout Questions

SLRA Section 4.3.1, "Transient Cycle Projections for 80 Years"

TRP: 143.9

Question Number	SLRA Section	SLRA Page	Background / Issue (As applicable/needed)	Discussion Question / Request
1	4.3.1	4-51	SLRA Section 4.3.1 states that the Fatigue Monitoring program will track cycles for significant fatigue transients listed in Table 4.3.1-1 and will ensure corrective action is taken prior to potentially exceeding fatigue design limits. SLRA Section 4.3.1 also states that a condition report will be initiated based upon an administrative limit of 80 percent of the fatigue cycles or if the minimum time for any transient event total occurrence projection to reach the allowable is less than three years. As discussed above, SLRA Section 4.3.1 addresses the issuance of a condition report regarding fatigue monitoring to ensure the number of cycles for each design transient does not exceed the design cycle limit. However, SLRA Section 4.3.1 does not clearly address the issuance a condition report to ensure the cumulative usage factor (CUF) and environmental CUF values do not exceed the design limit (1.0).	1. Clarify whether a condition report will be issued as part of the fatigue monitoring activities to ensure that the CUF and environmental CUF limit (1.0) as well as each design cycle is not exceeded. In addition, clarify whether the 80 percent of the CUF and environmental CUF limit (i.e., 0.8) will be used as the threshold for the issuance of a condition report.

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2	4.3.1	4-52	SLRA Section 4.3.1 indicates that the fatigue analyses are based upon numbers and amplitudes of thermal and pressure transients in UFSAR Table 5-2, "Transient Cycles for RCS [reactor coolant system] Components Except Pressurizer Surge Line" and UFSAR Table 5-23, "Operating Design Transient Cycles for Pressurizer Surge Line." Specifically, SLRA Table 4.3.1-1 describes the 80-year projected transient cycles in comparison with the design transient cycles that are described in UFSAR Tables 5-2 and 5-23. In its review of the transients, the staff noted that Transients 1A1, 1A2, 1A3, 1A4 and 1A5 (heatup transients) and Transients 1B1 and 1B2 (cooldown transients) for the pressurizer surge line, are listed in UFSAR Table 5-23 but these transients are not clearly identified in SLRA Table 4.3.1-1. The staff also noted that the following transients in UFSAR Table 5-2 are not listed in SLRA Table 4.3.1-1: (1) Transient 3, power loading 8 to 100 percent power; (2) Transient 4, power unloading 100 to 8 percent power; (3) Transient 5, 10 percent step load increase; (4) Transient 6, 10 percent step load decrease; (5) Transient 12, hydrotests; (6) Transient 18, loss of	1. Explain why SLRA Table 4.3.1-1 does not explicitly address Transients 1A1 through 1A5 and Transients 1B1 and 1B2 for the pressurizer surge lines and their design cycles and cycle projections. If the lack of these transients cannot be justified, revise SLRA Table 4.3.1-1, consistent with UFSAR Table 5-23 and provide the 80-year projected cycles for these transients. 2. Clarify why the following design transients and their design cycles in UFSAR Table 5-2 are not explicitly identified in SLRA Table 4.3.1-1: Transients 3, 4, 5, 6, 12, 18, 19 and 20. If the lack of these transients cannot be justified, revise SLRA Table 4.3.1-1, consistent with UFSAR Table 5-2 and provide the 80-year projected cycles for these transients.

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			feedwater heater; (7) Transient 19, feed and bleed operations; and (8) Transient 20, miscellaneous transients. The staff finds a need to resolve this potential inconsistency between SLRA Table 4.3.1-1 and the UFSAR transient tables.	
3	4.3.1, Table 4.3.1-1	4-54	SLRA Table 4.3.1-1, Note 1 and the related discussion in SLRA Section 4.3.4 indicate that, the pressurizer surge line, main steam penetrations and main feedwater penetrations have a reduced set of transient cycles, compared the design transient cycles listed in SLRA Table 4.3.1-1. However, SLRA Sections 4.3.1 and 4.3.4 do not clearly provide the following information: (1) the reduced set of the transient cycles and (2) whether the Fatigue Monitoring program will monitor the reduced set of the transients.	1. Provide the reduced set of allowable transient cycles discussed in SLRA Table 4.3.1-1, Note 1. 2. Clarify whether the Fatigue Monitoring program will perform monitoring to ensure that the actual transients do not exceed the reduced set of transient cycles.

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4	4.3.1 4.3.5	4-52 4-71	SLRA Section 4.3.5 addresses the analytical evaluation of flaws for the 80-year operation. The section indicates that the flaws identified for initial license renewal have been re-evaluated or the component containing the flaw has been replaced. SLRA Section 4.3.5 also explains that these reanalyzed flaws are now acceptable for their full controlling design basis transient cycles as discussed in Section 4.3.1. In comparison, UFSAR Table 5-2, Note 1 indicates that certain components have flaw tolerance evaluations (as addressed in UFSAR Sections 5.2.2 and 5.2.3.12.4) that assume a reduced number of heatup and cooldown cycles for the evaluations. Therefore, the staff finds a need to further confirm that, except for the pressurizer surge line flaw tolerance evaluations separately addressed in SLRA Section 4.3.4, the analytical evaluations of all the flaws discussed in SLRA Section 4.3.5 use the design transients and cycles identified in SLRA Section 4.3.1 without using a reduced set of transient cycles. The staff needs a similar confirmation for the weld overlay fatigue analysis discussed in SLRA Section 4.3.6.	1. Clarify whether the analytical evaluations of all the flaws discussed in SLRA Section 4.3.5 use the design transients and cycles identified in SLRA Section 4.3.1 without assuming a reduced set of transient cycles. If not, identify the reduced set of transient cycles. 2. Clarify whether the transients and cycles used in SLRA Section 4.3.6 (weld overlay fatigue analysis) are bounded by the design transients and cycles identified in SLRA Table 4.3.1-1. 3. Clarify whether the Fatigue Monitoring program will ensure that the actual transient cycles do not exceed the transient cycles that are assumed in the flaw evaluations and weld overlay fatigue analysis.

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5	4.3.1	4-51	Note 2 of UFSAR Table 5-2 indicates that, in order to analytically demonstrate a usage factor of less than 1.0, certain welds associated with the emergency high pressure injection (HPI) nozzles have been qualified for fewer than the design number of cycles of two transients as follows. Specifically, the sum of the cycles of the "manual actuation of HPI system after reactor trip" transient (Transient 8) and the cycles of "rapid depressurizations" transient (Transient 9) cannot exceed 29 cycles. Similarly, Note 7 of UFSAR Table 5-2 explains that the reactor vessel closure head assemblies are limited to 5000 cycles of "power loading and unloading" transient (Transients 3 and 4) and 15 cycles of "hydrotests" transient (Transient 12). In contrast, SLRA Table 4.3.1-1 does not include the design transients that have the reduced set of cycles that are specified in Notes 2 and 7 of UFSAR Table 5-2. The staff needs to resolve this potential inconsistency.	1. Clarify whether the reduced cycles of the transients specified in Notes 2 and 7 of UFSAR Table 5-2 are applied to the design cycles described in SLRA Table 4.3.1-1. 2. Justify why SLRA Table 4.3.1-1 does not include Transients 3, 4 and 12 in UFSAR Table 5-2 that involve the reduced cycles for the reactor vessel closure head assemblies. If it cannot be justified, revise SLRA Table 4.3.1-1 to include these transients, consistent with UFSAR Table 5-2.