St. Lucie SLRA: Breakout Questions
SLRA Section B.2.2.1, "Fatigue Monitoring"
TRP: 60

Note: Breakout Questions are provided to the applicant and will be incorporated into the publicly-available audit report.

Technical Reviewer	Seung Min	12/9/2021
Technical Branch Chief	Matt Mitchell	12/21/2021
Breakout Session	*Date/Time*	*To be filled in by PM*

Applicant Staff	**NRC staff**
To be filled out by PM during breakout	

Question Number	**SLRA Section**	**SLRA Page**	**Background / Issue (As applicable/needed)**	**Discussion Question / Request**	**Outcome of Discussion**
1	B.2.2.1	B-24	SLRA Section B.2.2.1 indicates that a new limit of 500 cycles will be specified for the "loss of letdown flow" transient for 80 years of operation, as listed in SLRA Tables 4.3.1-5 and 4.3.1-6. This new cycle limit is significantly greater than the existing cycle limit of 50 that is listed in SLRA Table 4.3.1-1. In relation to this discussion, Enhancement 3 of the Fatigue Monitoring program addresses the update to the plant procedure to monitor and track the "loss of letdown flow" transient for the subsequent period of extended operation (SPEO).	1. Explain the acceptability of increasing the cycle limit for the "loss of letdown flow" transient from 50 to 500. As part of the discussion, clarify whether the increase in the cycle limit can cause the projected 80-year environmental cumulative usage factors to exceed the design limit of 1.0. If so, describe how the aging effect of EAF will be managed.	

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			However, the SLRA does not clearly explain the acceptability of increasing the cycle limit for the "loss of letdown flow" transient from 50 to 500 in terms of environmentally assisted fatigue (EAF) analysis.		
2	B.2.2.1	B-25	Enhancement 1 of the Fatigue Monitoring program is to update the program governing procedure in order to monitor the chemistry parameters that provide inputs to environmental fatigue correction factors (F_{en}) used in environmental cumulative usage factor (CUF_{en}) calculations. The applicant also explained that the chemistry parameters include dissolved oxygen and sulfate and are controlled and tracked in accordance with the Water Chemistry program (SLRA Section B.2.3.2). The staff noted that the applicant relies on the guidance in NUREG/CR-6909, Revision 1 for calculating F_{en} and CUF_{en} values. However, the guidance does not identify sulfate concentration as an input parameter for F_{en} and CUF_{en} calculations. Therefore, the staff found a need to clarify whether the sulfate concentration of reactor coolant is used as an input parameter for the applicant's calculations of F_{en} and CUF_{en} values.	1. Clarify whether the sulfate concentration of reactor coolant is used as an input parameter for the applicant's calculations of F_{en} and CUF_{en} values. If so, explain why the use of the sulfate concentration is consistent with the guidance in NUREG/CR-6909, Revision 1.	

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3	B.2.2.1	B-25	Enhancement 2 of the Fatigue Monitoring program is to update the program governing procedure in order to identify and require monitoring of the 80-year plant design cycles, or projected cycles that are utilized as inputs to CUF_{en} (environmental cumulative usage factor) calculations, as applicable. Tables 3-1 and 3-2 of Westinghouse LTR-SDA-II-20-31-NP, Revision 2 provide the leading environmentally-assisted fatigue (EAF) locations for the equipment components and piping components, respectively. Tables 3-1 and 3-2 indicate that, for some equipment and piping components, reduced cycles of designed transients are used for the EAF analysis, compared to the design transient cycles described in SLRA Section 4.3.1. The staff noted that Enhancement 2 addresses the fatigue monitoring for the reduced cycles used in the EAF analysis. However, some of the transients, which involve the reduced cycles in the EAF analysis, are not monitored in the Fatigue Monitoring program as discussed in SLRA Tables 4.3.1-1 and 4.3.1-2. Specifically, the applicant proposed not to monitor the reduced cycles of the following transients used in the EAF analysis: (1) “plant unloading” transient (for Unit 1 control element driving mechanism motor housing, and Unit 1 and	1. Clarify whether Enhancement 2 includes the monitoring of the transients associated with the reduced cycles (i.e., “plant loading,” “plant unloading,” “purification” and “boric acid dilution” transients) used in the EAF analysis. If not, provide the basis for excluding these transients from fatigue monitoring given that the reduced cycles of these transients are used in the EAF analysis.	

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			2 charging system); (2) “plant loading” transient (for Unit 1 and 2 charging system); and (3) “purification” and “boric acid dilution” transients (for Unit 1 and 2 charging system). The staff found a need to clarify whether Enhancement 2 includes the monitoring of these transients associated with the reduced cycles (i.e., “plant loading,” “plant unloading,” “purification” and “boric acid dilution” transients). If not, the staff needs to confirm the adequacy of the basis for excluding these transients from fatigue monitoring given that the reduced cycles of these transients are used in the EAF analysis.		
4	B.2.2.1	B-25	Enhancement 5 of the Fatigue Monitoring program is to update the program governing procedure to add an additional acceptance criterion associated with high-energy line break (HELB) CUF criteria. This enhancement is applied only to St. Lucie Unit 2 and is related to the HELB analyses addressed in SLRA Section 4.3.4. The staff noted that the enhancement does not clearly define the additional acceptance criterion associated with the HELB CUF criteria. In addition, the enhancement does not clearly address any additional corrective actions that may	1. Clarify (1) what the additional acceptance criterion associated with HELB CUF criteria is and (2) why the criterion is needed (e.g., criterion is needed to determine HELB locations). 2. Describe any additional corrective actions that may need to be performed beyond the actions specified in the “corrective actions” program element if	

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			need to be performed beyond the actions specified in the “corrective actions” program element if the additional criterion associated with the HELB CUF criteria is not met.	the additional criterion is not met (e.g., additional HELB analysis for newly identified break locations and their effects).	
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