

**OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3 (ONS)
SUBSEQUENT LICENSE RENEWAL APPLICATION (SLRA)
REQUESTS FOR ADDITIONAL INFORMATION (RAIs)
SECOND ROUND RAIs
SAFETY REVIEW**

RAI B2.1.7-4b

Regulatory Basis:

Title 10 of the Code of Federal Regulations (CFR) Section 54.21(a)(3) requires an applicant to demonstrate that the effects of aging for each structure and component identified in 10 CFR 54.21(a)(1) will be adequately managed so that the intended function(s) will be maintained consistent with the current licensing basis for the period of extended operation. One of the findings that the U.S. Nuclear Regulatory Commission (NRC) staff must make to issue a renewed license (10 CFR 54.29(a)) is that actions have been identified and have been or will be taken with respect to managing the effects of aging during the period of extended operation on the functionality of structures and components that have been identified to require review under 10 CFR 54.21, such that there is reasonable assurance that the activities authorized by the renewed license will continue to be conducted in accordance with the current licensing basis.

Per 10 CFR 54.21(c), the applicant is required to evaluate time limited aging analyses (TLAA) and disposition them in accordance with (c)(1)(i), (c)(1)(ii), or (c)(1)(iii). SRP-SLR Section 4.6.1.1 states, in part: "The ASME Code contains explicit requirements for fatigue parameter evaluations (fatigue analyses or fatigue waivers), which are TLAA's."

In order to complete its review and enable making a finding under 10 CFR 54.29(a), the staff requires additional information in regard to the matters described below.

Background:

In Section B2.1.7 of Oconee Nuclear Station (ONS) SLRA Appendix B, the applicant downgraded the EPRI MRP-227 based classification of the core barrel (CB) top cylinder-to-bottom cylinder circumferential seam welds, the CB top flange-to-top cylinder circumferential seams welds, and the CB bottom flange-to-bottom cylinder circumferential seam welds in Units 1 and 3 and the CB top cylinder and bottom cylinder axial seam welds in Units 1, 2 and 3 from being designated as "Expansion" category components of the program to "No Additional Measures" (NAM) category components of the program.

The applicant's response to RAI B2.1.7-4 dated February 14, 2022 (ADAMS Accession No. ML22045A020) states that the CB cylinder axial seam welds and CB middle circumferential seam welds meet the dose and stress levels for susceptibility to both irradiation-assisted stress corrosion cracking (IASCC) and neutron irradiation embrittlement (IE). The response also identifies these welds as [REDACTED] (ADAMS Accession No. ML20091K284). The RAI response further states that "IASCC has been addressed" for these welds, "and it is justified and concluded these welds at all three Oconee Units are downgraded to No Additional Measures," however, no basis was provided for this statement.

The applicant's response also states that the referenced CB weld types are [REDACTED]

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In addition, the applicant's response to RAI B2.1.7-4 states:

"A cumulative usage factor (CUF) value for the Oconee Units 1, 2, and 3 core barrel was recently calculated. As a result of this calculation, fatigue is downgraded to No Additional Measures for the core barrel of all Oconee Units" and

"IE has been addressed for the core barrel cylinder, and [REDACTED]

[REDACTED]]. Therefore, for Oconee Units 1 and 3, IE for the core barrel cylinder and top flange is considered No Additional Measures."

On May 17 and 18, 2022, the staff held a supplemental audit regarding the applicant's basis for placing the referenced CB welds into the NAM category of the Reactor Vessel Internals Program and the applicant's fatigue and SCC screening bases for the referenced CB welds. In preparation of the presentations and discussions made by the applicant to the staff during the supplemental audit of May 17 and 18, 2022, the applicant placed its supplemental fatigue analysis for the CB assemblies and welds onto the supplemental audit ePortal for the SLRA. The staff reviewed the adequacy of this fatigue screening document as part of its supplemental audit review activities.

In the supplemental fatigue analysis, the applicant calculated a bounding and limited cumulative usage factor (CUF) value of [REDACTED] for the CB assemblies and welds; the calculation demonstrates the CUF value in the supplemental analysis is greater than the EPRI MRP [REDACTED] in MRP-189, Revision 3. But, as it has been explained in SLRA AMP B2.1.7 (on SLRA page B-66), the applicant determined that the EPRI MRP's [REDACTED] in MRP-189, Revision 3 was overly conservative and not applicable to the current licensing basis (CLB) for the ONS units. Consistent with this basis, on SLRA page B-66, the applicant indicates that it used an alternate fatigue screening criterion of 1.0 for the fatigue screening objectives of the reference CB assemblies and welds.

Issue:

As part of the discussion held with the applicant during the supplemental audit of May 17 and 18, 2022, the applicant indicated that the basis for use of an alternative fatigue screening value of 1.0 is given in the ASME Boiler and Pressure Vessel Code, Section III, Subsection NG (ASME III NG). However, based on its review of the CLB, the staff notes that the RVI core support structure components in the ONS units were not designed and evaluated to ASME III NG design rules because the ASME Section III version of record used for the plant design preceded the development of ASME III NG rules for PWR RVI core support structure components (which include CB assemblies and their welds). This is reflected on page B-66 of the SLRA and demonstrated by the fact that Sections 4.1 and 4.3 of the SLRA do not cite or include an ASME III NG design basis fatigue TLAA (CUF-based) for the RVI core support structure components in the units. Thus, other than the mention of this alternate fatigue screening criterion on page B-66 in the SLRA, the staff has no record of the applicant's basis and justification of adopting an alternative ASME III NG-based fatigue (CUF) screening criterion of 1.0 for the fatigue calculation that was performed for the CB assemblies and welds.

Request:

Provide the basis for adopting an alternative AMSE III NG-based fatigue (CUF) screening criterion of 1.0 for the supplemental fatigue calculation that was performed for the CB assemblies and welds. As part of this basis, explain the use of this screening criterion of 1.0 when taken in light of the fact that ASME Section III NG design rules and criteria are not part of the CLB for the RVI core support structure components (including the CB assemblies) in the ONS units.