

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

**RAI B2.1.7-4a**

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. 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 SLRA Appendix B, the applicant downgraded the core barrel (CB) top cylinder-to-bottom cylinder circumferential seam welds (henceforth CB cylinder middle circumferential seam welds), the CB top flange-to-top cylinder circumferential seams welds (henceforth the CB top flange circumferential seam welds), and the CB bottom flange-to-bottom cylinder circumferential seam welds (henceforth the CB bottom flange circumferential seam welds) in Units 1 and 3 and the CB top cylinder and bottom cylinder vertical seam welds (henceforth CB cylinder vertical seam welds) in ONS 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 (ADAMS Accession No. ML22045A020) states that the CB cylinder vertical 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 as a proprietary, non-publicly available record in ADAMS). 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]

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

~~PROPRIETARY INFORMATION~~

“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”

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

Further, in the applicant’s response to RAI B2.1.7-5 in letter dated February 14, 2022 (ADAMS Accession No. ML22045A020), the applicant amended SLRA Table 3.1.2-2 to include new plant-specific Note 3, which states:

“The core barrel cylinder (including vertical and circumferential seam welds) was downgraded to No Additional Measures for Units 1 and 3 as justified in MRP-227-A Applicant/Licensee Action Item 6.”

The CB assemblies containing the CB cylinder vertical seam welds, CB flange circumferential seam welds, and CB cylinder middle circumferential seam welds serve a safety-related intended function pursuant to the requirements in 10 CFR 54.4(a)(1)(ii) and (iii), specifically, to control bypass around the core during a loss-of-coolant-accident (LOCA) (see the response to RAI #4-1 on MRP-227, Rev. 0 report, as given in ADAMS Accession No. ML103160381).

Issues:

1. The applicant’s statements in its response to RAI B2.1.7-4 are internally inconsistent and do not provide a sufficient basis for the proposed NAM categorization of the CB cylinder vertical seam welds and CB middle circumferential seam welds for either IASCC or IE, given the safety-related function of the CB cylinders and welds.

This issue applies to the applicant’s NAM category basis for the referenced CB welds in the new plant-specific Note 3 that was added to SLRA Table 3.1.2-2, which uses the staff’s past issuance of Applicant/Licensee Action Item (A/LAI) #6 as the rationale for the NAM category ranking of the CB welds in the Note 3 basis. However, in A/LAI #6 (as evaluated and issued in Section 3.3.6 of the staff’s December 16, 2011, safety evaluation for the MRP-227, Revision 0 report [ADAMS Accession No. ML11308A770]), the staff left the CB cylinders and associated cylinder seam welds as “*inaccessible*” Expansion category components for B&W-designed PWR Vessel Internals Programs. In turn, these A/LAI criteria formed the current EPRI MRP bases for designating the referenced CB assembly weld components as “*inaccessible*” Expansion category components in I&E Item B10.1 of Table 4-4 in the MRP-227, Revision 1-A report and in the corresponding I&E line item for the components in Table 4-4 of the previous MRP-227-A report. Thus, use of the A/LAI #6 basis would actually place the referenced CB assembly welds into the “Expansion” category grouping of the program, which is in direct opposition to the applicant’s claim that the referenced CB assembly welds can be placed into the NAM category of the program based on the criteria of A/LAI #6.

2. The applicant’s inspection category basis for all CB assembly seam welds (including the ONS Unit 2 CB flange and middle circumferential seam weld types that are designated as Primary components for the AMP) alters the weld accessibility considerations from

~~PROPRIETARY INFORMATION~~

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those previously defined for the welds by Framatome and the EPRI MRP in MRP-227-A and MRP-227, Rev. 1-A; in these reports, the EPRI MRP previously identified that all B&W-designed CB assembly seam weld types are inaccessible to EVT-1 visual inspection equipment and left the welds as Expansion category welds for the MRP-227, Rev. -A and 1-A versions of the program (with the linked Primary components being the core baffle plates in the units). Given the safety-related intended function of the CB assemblies, the change to the “accessibility” criteria for B&W-design CB assembly seam weld types, and the safety-significance of the matter raised in Part 1 of this RAI, CB seam weld accessibility needs to be properly defined and justified for the version of the ONS PWR Vessel Internals Program that will be implemented during the subsequent period of extended operation.

Requests:<sup>1</sup>

1. Provide a justification for the NAM categorization of the welds for the CB cylinder vertical seam welds in Units 1, 2, and 3, and the CB top and bottom flange circumferential seam welds and the CB cylinder middle circumferential seam welds in Units 1 and 3. Alternatively, propose an alternate inspection category and basis (other than NAM category).
2. Given the request in Part 1, define the percentage of weld length that is accessible to EVT-1 visual inspection equipment for the following CB assembly seam weld types in ONS Units 1, 2, and 3: (a) CB top flange circumferential seam welds, (b) CB top cylinder vertical seam welds, (c) CB bottom cylinder vertical seam welds, (d) CB cylinder middle circumferential seam welds, and (e) CB bottom flange circumferential seam welds.

For each seam weld type, provide the following additional information if it is determined and established that the given CB assembly seam weld type is only partially accessible to inspection:

- (a) clarify and demonstrate how the portion of the weld that is accessible to inspection meets the minimum 75% accessibility criterion on weld length established by the EPRI MRP for partially accessible welds in its response to RAI 4-8 on the MRP-227, Revision 0 report methodology (Refer to the response to RAI 4-8 in ADAMS Accession No. ML103160381), and
- (b) clarify how potential aging will be addressed for those portions of the weld lengths that may be identified as being inaccessible to the inspection equipment.

If it is determined that the weld type is inaccessible to inspection or would not meet the minimum 75% criterion on accessible weld length, provide sufficient technical information to support and justify the inspection category basis for the weld type (including details on inspections and potential Expansion bases), given the RAI Part 1 consideration above that the proposed NAM categorizations for the given CB assembly

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<sup>1</sup> The scope of this request applies to both the NAM category basis for the referenced CB assembly welds in SLRA Appendix B, Section B2.1.7, “PWR Vessels Internals Program,” and in the newly developed Note 3 that was added to SLRA Table 3.1.2-2 in Attachment 44 of the letter of February 14, 2022 (ADAMS Accession No. ML22045A020).

~~PROPRIETARY INFORMATION~~

seam weld types have not been adequately justified. Provide the basis of your findings for this Part of the RAI.

~~PROPRIETARY INFORMATION~~