

MRP Materials Reliability Program _____ **MRP 2020-012**

May 4, 2020

EPRI Docket No. 99902021

U.S. Nuclear Regulatory Commission
Document Control Desk
11555 Rockville Pike
1 White Flint N; Mail Stop: 0-12-D2
ROCKVILLE, MD 20852

Dear Sir:

EPRI is in receipt of NRC's letter dated 2/19/2020 (ML20006D152). This letter provides responses to the NRC's comments in the attachment. Please note that we believe NRC's comment/issue #4 has been previously addressed in NRC's Safety Evaluation Report for EPRI Topical Report MRP-227, Revision, "Materials Reliability Program: Pressurized Water Reactor Internals Inspection and Evaluations Guideline" (CAC NO.MF7223), dated 4/25/2019 (ML19081A001), specifically in section 3.6.3.

If you have questions, please advise the undersigned.

Sincerely,



Mike Hoehn II, Ameren-Missouri
MRP Research Integration Committee Chair



Brian Burgos, Sr. Program Manager
EPRI-MRP

Enclosure:

Responses to Nuclear Regulatory Commission Staff Comments on MRP-227, Revision 1-A

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Responses to Nuclear Regulatory Commission Staff Comments on MRP-227, Revision 1-A

Prepared for EPRI by:

Westinghouse Electric Company LLC
Cranberry, PA

Ref. Westinghouse letter LTR-ALMR-20-37

Attachment 1

Responses to Nuclear Regulatory Commission Staff Comments on MRP-227, Revision 1-A

1 Background and Purpose

MRP-227, Revision 1 was published in October 2015 [1] and transmitted to the U.S. Nuclear Regulatory Commission (NRC) for review and approval in December 2015 [2] with an errata letter issued in January 2017 to address several corrections [3]. The NRC staff conducted its review of MRP-227, Revision 1 and provided a safety evaluation in April 2019 [4].

The industry, through the Materials Reliability Program (MRP), updated MRP-227, Revision 1 to Revision 1-A, incorporating the various changes committed to during the response to NRC requests for additional information during the safety evaluation process. MRP-227, Revision 1-A was published in December 2019 [5] and sent to the NRC for final review and acceptance in letter MRP 2019-033 [6].

The NRC staff provided acceptance of MRP-227, Revision 1-A in a letter dated February 19, 2020 [7], stating:

The -A version of the TR incorporates the NRC staff's safety evaluation. Based on its review of MRP-227, Revision 1-A, the NRC staff has determined that the TR is acceptable to the extent delineated in the NRC staff's safety evaluation dated April 25, 2019 (ADAMS Accession No. MLI9081A001).

However, this was qualified by the inclusion of an enclosure table containing five (5) comments from the NRC staff on the published MRP-227, Revision 1-A report and the following statement in the letter:

Any facility referencing MRP-227, Revision 1-A should address the items contained in the enclosure to this letter.

The purpose of this letter is to address these five comments generically. A utility referencing MRP-227, Revision 1-A may reference this letter to meet the recommendation of the NRC verification letter for MRP-227, Revision 1-A [7].

2 Industry Responses to NRC Staff Comments on MRP-227, Revision 1-A

The NRC staff comments on MRP-227, Revision 1-A from the enclosure of the verification letter [7] and the industry responses are included in Table 1.

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Table 1: Responses to U.S. NRC Staff Comments on MRP-227, Revision 1-A as Provided in [7]

Issue No.	Issue Topic Or Confirmation Topic	Issue Topic Gap in MRP-227, Rev. 1-A, or TR Topic Needing Confirmation from EPRI with Regard to Contents in Rev. 1-A	Topic Issue Needing Confirmation or Consideration from the EPRI MRP	Industry Response
<i>Content Issues in MRP-227, Rev. 1-A (the TR) Needing Attention and Potential Resolution by EPRI</i>				
1	Combustion Engineering-design (CE-design) core support column bolts Item C1.1 in TR Table 4-5 “Expansion” Category Components	The line item entry for the core support column bolts in TR Table 3-2 (on page 3-24) identifies that the bolts are located in the lower support structure. In comparison to the line item entry for the bolts in TR Table 3-2, Item C1.1 in TR Table 4-5 (on page 4-30) identifies that the core support column bolts are located in core shroud assembly for CE-design plants with bolted core shroud assembly designs.	Either the line item entry for the core support column bolts in TR Table 3-2 needs to be moved from the lower support structure part of the table to the core shroud part of the table, or Line Item C1.1 in TR Table 4-5 needs to change the listed assembly from “ Core Shroud Assembly (Bolted) ” to “ Lower Support Structure ”. TR Table 5-2 would need to be adjusted accordingly.	The core support column bolts are considered part of the CE lower support structure. Thus, the entry in Table 3-2 is correct in MRP-227, Revision 1-A. The Component assembly for C1.1 “Core support column bolts” in Table 4-5 should be “Lower Support Structure” instead of “Core Shroud Assembly (Bolted)”. C1.1 also appears in Table 5-2 in the C1 “Core Shroud Assembly (Bolted) – Core shroud bolts” row; however, this entry does not include the component assembly for the C1.1 “Core support column bolts” and is correct in MRP-227, Revision 1-A. This incorrect component assembly for the CE Core Support Column Bolts in Table 4-5 was also present in MRP-227-A [8] and was not changed for MRP-227, Revision 1 or Revision 1-A. The core support column bolts are only applicable for one currently operating plant (Palisades). This one plant should make this component assembly name correction when implementing MRP-227, Revision 1-A. Additionally, this editorial change will be made in MRP-227, Revision 2.

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Table 1: Responses to U.S. NRC Staff Comments on MRP-227, Revision 1-A as Provided in [7] (cont.)

Issue No.	Issue Topic Or Confirmation Topic	Issue Topic Gap in MRP-227, Rev. 1-A, or TR Topic Needing Confirmation from EPRI with Regard to Contents in Rev. 1-A	Topic Issue Needing Confirmation or Consideration from the EPRI MRP	Industry Response
2	<p>CE-design core support barrel (CSB) assembly lower flange weld (LFW)</p> <p>Line item entry for the LFW in TR Table 3-2</p> <p>(See line item on page 3-25 of the TR)</p>	<p>The line item for the CSB LFW in TR Table 3-2 (on page 3-25) identifies that the final inspection category for the LFW is “Primary”.</p> <p>In comparison, TR Table 4-2 (the TR’s examination table for Primary Components) does not include any line item entry for the CSB LFW. Instead, TR Table 4-2 includes Line Item C7 (on page 4-19) for what is defined as a flexure weld in the CSB and which is identified as a lead “Primary” category component for CE-designed plants.</p>	<p>If the CSB LFW is the same as the CSB flexure weld, then the line item entries for the weld in TR Table 3-2 and 4-2 need to be adjusted to make it clear that the CSB LFW and CSB flexure weld are the same component.</p> <p>Otherwise, if the CSB LFW is not the same component as the CSB flexure weld, then a line item entry for the CSB flexure weld needs to be added to TR Table 3-2 and a line item for the CSB LFW needs to be added to TR Table 4-2.</p> <p>TR Table 5-2 would need to be adjusted accordingly.</p>	<p>Item C7 “CSB Flexure Weld” in Table 4-2 of MRP-227, Revision 1-A is a more detailed name for the “Lower Core Barrel Flange Weld” in Table 3-2. The CSB flexure weld was named “Lower flange weld” in MRP-227-A [8], but this created potential confusion, since there are two welds located at the CE core support barrel lower flange. The fatigue concern is for the flexure weld (Primary Item C7), while the weld that fastens the lower flange to the barrel was included in Revision 1-A as C5.1 “Lower Girth Weld (LGW)”.</p> <p>Section 3 of MRP-227 (all revisions) is provided as a background section summarizing the development of the reactor vessel internals aging management requirements in Sections 4 and 5. Per MRP-227, Revision 1-A, Section 7.3, the NEI 03-08 “Needed” requirement tables are Tables 4-1 through 4-9 and Tables 5-1 through 5-3. The background information in Section 3 is not included as an NEI 03-08 requirement. Section 3 provides valuable historic information from documents such as MRP-191 and MRP-232, but the requirements in Sections 4 and 5 are final and may be refined from the background in Section 3.</p> <p>Note that this potential for differences between the intermediate stage tables provided in Section 3 and the actual guidance tables provided in Sections 4 and 5 was addressed in the last paragraph of Section 3.3.2, just before the tables:</p> <p><i>"Note that the component nomenclature used in theses tables is consistent with the bases documents and may not be the same as that used in the tables of Sections 4 and 5. Also, the final grouping (P, E, N, X) listed here is an intermediate result and does not represent the final updated inspection strategy as defined for this revision of the guidelines."</i></p>

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Table 1: Responses to U.S. NRC Staff Comments on MRP-227, Revision 1-A as Provided in [7] (cont.)

Issue No.	Issue Topic Or Confirmation Topic	Issue Topic Gap in MRP-227, Rev. 1-A, or TR Topic Needing Confirmation from EPRI with Regard to Contents in Rev. 1-A	Topic Issue Needing Confirmation or Consideration from the EPRI MRP	Industry Response
3	CE-design core support barrel (CSB) assembly lower girth welds (LGWs) Item C5.1 in TR Table 4-5 “Expansion” category components	<p>The line item entry for CSB LGWs in TR Table 3-2 (Page 3-25) identifies that the LGWs are “Primary” category components for CE-design plants. This line item includes a reference to Table Note 4 on the SCC and IE mechanisms and Final Group entries for the line item, with Note 4 stating “Upgraded to Primary” from “Expansion” in accordance with the NRC SER on MRP-227, Revision 0.” The line item also includes a reference to Table Note 7 for the listed IASCC entry in the line item, with Note 7 stating: “Mechanism “IASCC” upgraded from “No Additional Measures” to “Primary for lower cylinder welds in accordance with NRC SER on MRP-227, Revision 0.”</p> <p>In comparison to the line item entry for the CSB LGWs in TR Table 3-2, Item C5.1 in TR Table 4-5 (on Page 4-29) identifies that the CSB LGWs are “Expansion” category components for CE-design plants.</p>	<p>If the EPRI MRP downgraded the CE-design CSB LGWs to “Expansion” category components in response to one of our RAIs for the MRP-227, Revision 1 methodology and we accepted the RAI basis change in our April 25, 2019 safety evaluation for the MRP-227, Rev. 1 methodology, then the SCC, IASCC, IE and Final Group column references for the CSB LGWs in the Table 3-2 of the MRP-227, Rev. 1-A report will need to be fixed from “P” to “E”, and Notes 4 and 7 for TR Table 3-2 will need to be adjusted accordingly. However, the existing TR Table 3-2 notes in the draft MRP-227, Rev. 1-A report appear to indicate that the CSB LGWs remain as “Primary” category components.</p> <p>If instead, the CSB LGWs remain as “Primary” category components for the program, then Item C5.1 for the CSB LGWs is incorrect and needs to be deleted from the scope of TR Table 4-5, and a new Item for the CSB LGWs would need to be developed and included in Table 4-2 of the MRP-227, Rev. 1-A report. Table 5-2 would need to be adjusted accordingly.</p>	<p>The “Lower Cylinder Girth Welds” in Table 3-2 of MRP-227, Rev. 1-A do not represent C5.1 “CSB Lower Girth Weld (LGW)” in Table 4-5. A review of the aging degradation mechanisms cited for each one makes this clear: the Table 3-2 lower cylinder girth welds were included for stress corrosion cracking (SCC), irradiation-assisted SCC, and irradiation embrittlement while the Table 4-5 CSB lower girth weld was included in the Expansion table for SCC and fatigue. Instead, the “Lower Cylinder Girth Welds” in Table 3-2 represent C6 “Middle Girth Weld (MGW)” in Table 4-2 of MRP-227, Rev. 1-A, which is a primary item, consistent with the Table 3-2 entry.</p> <p>Item C5.1 “CSB Lower Girth Weld (LGW)” is represented by the “Lower Core Barrel Flange” in Table 3-2. The aging degradation concern for the lower core barrel flange listed in Table 3-2 is the weld that connects the flange to the barrel cylinder, known as the “Lower Girth Weld”. The degradation mechanisms and suggested inspection category listed in Table 3-2 for the lower core barrel flange match those for C5.1 in Table 4-5 of MRP-227, Rev. 1-A.</p> <p>As noted for Issue No. 2, Section 3 of MRP-227 (all revisions) is provided as a background section summarizing the development of the reactor vessel internals aging management requirements in Sections 4 and 5 and only Tables 4-1 through 4-9 and 5-1 through 5-3 are designated as NEI 03-08 “Needed” requirements per MRP-227, Rev. 1-A, Section 7.3. The background information in Section 3 is not included as an NEI 03-08 requirement. Section 3 provides valuable historic information from documents such as MRP-191 and MRP-232, but the requirements in Sections 4 and 5 are final and may be refined from the background in Section 3.</p> <p>Also, as noted for Issue No. 2, the last paragraph of Section 3.3.2 clarifies the potential for differences between the intermediate tables in Section 3 and the actual guidance tables in Sections 4 and 5.</p>

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Table 1: Responses to U.S. NRC Staff Comments on MRP-227, Revision 1-A as Provided in [7] (cont.)

Issue No.	Issue Topic Or Confirmation Topic	Issue Topic Gap in MRP-227, Rev. 1-A, or TR Topic Needing Confirmation from EPRI with Regard to Contents in Rev. 1-A	Topic Issue Needing Confirmation or Consideration from the EPRI MRP	Industry Response
4	<p>CE-Design Incore Instrumentation (ICI) Thimble Tubes</p> <p>Line item entry for the “ICI Thimble Tubes-Lower” in TR Table 3-2</p> <p>(See line item on page 3-26 of the TR)</p>	<p>The line item for the ICI thimble tubes in Table 3-2 (on page 3-26) of the MRP-227, Rev. 1-A report indicates that CE-design “ICI thimble tubes – lower” are “Existing Program” components for CE-designed plants; yet Table 4-8 in the report does not include any line item entry for “ICI Thimble-Tubes – Lower.”</p>	<p>The EPRI MRP needs to establish whether the MRP-227, Rev. 1-A guidelines are continuing to define the “ICI Thimble Tubes-Lower” as “Existing Program” components for CE-design RVI aging management programs, and if so, whether the inclusion of the tubes in the “Existing Program” category is based on the designation of the ICI thimble tubes as ASME Section XI components or known site-specific programs for the tubes, therefore may need a revision to Table 4-8 to include a line item for the thimble tubes.</p>	<p>This comment has been resolved by the NRC staff SE on MRP-227, Revision 1-A, specifically in 3.6.3. Selected text is included here:</p> <p><i>A/LAI 3 was included in Ref. 16 because MRP-227-A did not provide adequate guidance for applicants/licensees to document the details of the plant-specific existing programs in plant-specific RVI programs. The NRC staff notes that MRP-227-A did state, with regard to existing plant-specific programs for CE-design RVI, that “the guidance for in-core instrumentation (ICI) thimble tubes and thermal shield positioning pins is limited to plant-specific recommendations and thus have no generic reference, nor are they included in Table 4-8. The owner should review their specific design, upgrade status, and plant commitments for CE ICI thimble tubes.”</i></p> <p>And later in Section 3.6.3:</p> <p><i>In MRP-227, Revision 1, the guidance, with regard to CE existing plant-specific items, has been eliminated. The NRC staff reviewed the status of the resolution of A/LAI 3 for the CE units implementing MRP-227-A. The staff has received submittals for 8 of the 10 operating CE units for review of the plant-specific RVI programs. The NRC staff has approved the RVI programs for all 8 of these units. A/LAI 3 was either not applicable or successfully resolved for all 8 of these units. For the two remaining CE units, the licensee does not have a commitment to submit the RVI program for NRC staff review.</i></p> <p><i>Therefore, A/LAI 3 is resolved or expected to be resolved as part of implementation of RVI programs based on MRP-227-A for all CE units that have commitments to submit RVI programs for staff review and approval. A/LAI 3 can be eliminated for CE-design RVI in the accepted version MRP-227, Revision 1.</i></p> <p>The resolution of A/LAI 3 shows that while the “Existing” designation in Table 3-2 of MRP-227, Revision 1-A for the ICI Thimble Tubes-Lower is still correct, there is no need to add the component to Table 4-8.</p>

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Table 1: Responses to U.S. NRC Staff Comments on MRP-227, Revision 1-A as Provided in [7] (cont.)

Issue No.	Issue Topic Or Confirmation Topic	Issue Topic Gap in MRP-227, Rev. 1-A, or TR Topic Needing Confirmation from EPRI with Regard to Contents in Rev. 1-A	Topic Issue Needing Confirmation or Consideration from the EPRI MRP	Industry Response
<i>Confirmations Needed from the EPRI MRP on Renumbering of Restructuring of Table Notes in MRP-227, Rev. 1-A</i>				
5a	Confirmation of Changes to Tabular Footnote References for TR Tables 4-1 through 4-6 and 4-8 and 4-9	<u>Notes for Item W6 in TR Table 4-3.</u> For Westinghouse-design “Primary” components associated with Item W6 (i.e., baffle-former bolts) in TR Table 4-3, the applicable note designations for the bolts went from Notes 3, 6, and 9 in Table 4-3 of the MRP-227, Rev. 1 report to Notes 3, 4, 7, and 9 in Table 4-3 of the draft MRP-227, Rev. 1-A report.	(Note 1)	<p>W6:</p> <p>Component notes 3, 6, and 9 from Table 4-3 of MRP-227, Revision 1 for component W6 “Baffle-Former Bolts” appear as Notes 3, 4, and 7 in Table 4-3 of MRP-227, Revision 1-A. The note numbers changed from “6” to “4” and from “9” to “7” due to the administrative deletion of notes 4 and 5, because neither of those notes were actually referenced in Table 4-3 in MRP-227, Revision 1.</p> <p>Component notes 8 and 9 were added into MRP-227, Revision 1-A for component W6 in accordance with the response to NRC RAI 8 and the clarification of the response to RAI 8 (see Appendix D of MRP-227, Revision 1-A).</p>
5b	Confirmation of Changes to Tabular Footnote References for TR Tables 4-1 through 4-6 and 4-8 and 4-9	<u>Notes for Item W1 in TR Table 4-3.</u> For Westinghouse-design “Primary” components associated with Item W6 (i.e., CRGT guide cards) in TR Table 4-3, applicable note designation went from Note 7 in Table 4-3 of the MRP-227, Rev. 1 report to Note 5 in Table 4-3 of the draft MRP-227, Rev. 1-A report.	(Note 1)	<p>W1:</p> <p>Component note 7 from Table 4-3 of MRP-227, Revision 1 for component W1 “CRGT Guide plates (cards)” appears as Note 5 in MRP-227, Revision 1-A. The note number changed from “7” to “5” due to the administrative deletion of notes 4 and 5, because neither of those notes were actually referenced in Table 4-3 in MRP-227, Revision 1. The note text was updated in MRP-227, Revision 1-A in accordance with the response to NRC RAI 19 on MRP-227, Revision 1 and the clarifications made on NRC RAI 19 (see Appendix D of MRP-227, Revision 1-A).</p>

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Table 1: Responses to U.S. NRC Staff Comments on MRP-227, Revision 1-A as Provided in [7] (cont.)

Issue No.	Issue Topic Or Confirmation Topic	Issue Topic Gap in MRP-227, Rev. 1-A, or TR Topic Needing Confirmation from EPRI with Regard to Contents in Rev. 1-A	Topic Issue Needing Confirmation or Consideration from the EPRI MRP	Industry Response
5c	Confirmation of Changes to Tabular Footnote References for TR Tables 4-1 through 4-6 and 4-8 and 4-9	<u>Notes for Items C5 and C6 in TR Table 4-2.</u> For CE-design “Primary” components associated with Item C5 (core support barrel upper flange weld) and Item C6 (i.e., core support barrel middle girth weld) in TR Table 4-2, the applicable note designations went from Notes 5 and 6 in Table 4-2 of the MRP-227, Rev. 1 report to Note 5 in Table 4-3 of the draft MRP-227, Rev. 1-A report. For some reason, the EPRI MPR did not reference the renumbered Note 5 in the “Examination Column entries for Items C5 and C6 in Table 4-2 of the MRP-227, Rev. 1-A report.	(Note 1) <u>Additional clarifications for notes associated with TR Table 4-2, Items C5 and C6.</u> For the change in the designation of Note 6 in Table 4-2 of TR MRP-227, Rev. 1 to Note 5 in Table 4-2 of MRP-227, Rev. 1-A, EPRI MRP to confirm whether or not the failure to reference the renumbered Note 5 in the “Examination Coverage” column entries for Item C5 and C6 in Table 4-2 of the MRP-227, Rev. 1-A was an inadvertent omission and whether or not the “Examination Coverage” column entries for Items C5 and C6 in Table 4-2 of the Rev. 1-A report should be amended to include reference to both renumbered Notes 4 and 5 (and not just renumbered Note 4).	C5 and C6: Component Notes 5 and 6 from Table 4-2 of MRP-227, Revision 1 for components C5 “Upper flange weld (UFW)” and C6 “Middle Girth Weld (MGW)” appear as Notes 4 and 5 in MRP-227, Revision 1-A. The note numbers changed from “5” and “6” to “4” and “5” due to the administrative deletion of Note 3 from Table 4-2 of Revision 1-A, because that note only referred to the core support columns (formerly C8 in Revision 1). The core support columns were moved to Table 4-5 (C6.3 in Revision 1-A) in accordance with the response to NRC RAI 9 on MRP-227, Revision 1 (see Appendix D of MRP-227, Revision 1-A). Component Note 6 from Table 4-2 of MRP-227, Revision 1 (now Note 5 in Revision 1-A) was removed from components C5 and C6 consistent with the notes included for these components in response to NRC RAI 29. Note 6 from MRP-227, Revision 1 required expansion to the uninspected portion of the C5 and C6 welds during the same outage if significant flaws were found in the Primary inspection sample. The Primary Component coverage for C5 and C6 in Table 4-2 of MRP-227, Revision 1-A is 100% of the accessible weld length of one side of the weld instead of the 25% required in MRP-227, Revision 1. The change in coverage made the MRP-227, Revision 1 Note 6 obsolete and unnecessary for C5 and C6. (Note that Revision 1 Note 6 was kept in Revision 1-A as the renumbered Note 5 because it was still referenced for C12 “Lower Support Structure Deep beams”).

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Table 1: Responses to U.S. NRC Staff Comments on MRP-227, Revision 1-A as Provided in [7] (cont.)

Issue No.	Issue Topic Or Confirmation Topic	Issue Topic Gap in MRP-227, Rev. 1-A, or TR Topic Needing Confirmation from EPRI with Regard to Contents in Rev. 1-A	Topic Issue Needing Confirmation or Consideration from the EPRI MRP	Industry Response
5d	Confirmation of Changes to Tabular Footnote References for TR Tables 4-1 through 4-6 and 4-8 and 4-9	<p><u>Notes for Items W3 and W4 in TR Table 4-3.</u> For “Primary” components associated with Item W3 (core barrel upper flange weld) and Item W4 (i.e., core barrel lower girth weld) in TR Table 4-3, the applicable note designations went from Notes 8 and 10 in Table 4-3 of the MRP-227, Rev. 1 report to Note 6 in Table 4-3 of the draft MRP-227, Rev. 1-A report.</p> <p>The applicable note on minimum inspection coverages applying to the “Primary” core barrel welds in Items W3 and W4 of Table 4-3 in MRP-227, Rev. 1, was listed as Note 8. In Table 4-3 of MRP-227, Rev. 1-A, the note on minimum inspection coverages applying to Items W3 and W4 was renumbered to Note 6. For some reason this note did not carry forward as an applicable note for Table 4-3 of the report similar to manner that the analogous note for CE “Primary” core support barrel welds had carried over in Table 4-2 of the report. Thus, the “Examination Coverage” column entries for Items W3 and W4 in Table 4-3 of the MRP-227, Rev. 1-A report do not currently include reference to a note that is analogous to Note 10 in Table 4-3 of the MRP-227, Rev. 1 report.</p>	<p>(Note 1)</p> <p><u>Additional clarifications for notes associated with TR Table 4-3, Items W3 and W4.</u> EPRI to confirm whether or not the “Examination Coverage” column entries for Items W3 and W4 in Table 4-3 of the MRP-227, Rev. 1-A report should include reference to a renumbered note that is analogous to Note 10 in Table 4-3 of the MRP-227, Rev. 1 report.</p>	<p>W3 and W4:</p> <p>Component note 8 from Table 4-3 of MRP-227, Revision 1 for components W3 “Upper flange Weld (UFW)” and W4 “Lower girth weld (LGW)” appears as Note 6 in MRP-227, Revision 1-A. The note number changed from “8” to “6” due to the administrative deletion of notes 4 and 5, because neither of those notes were actually referenced in Table 4-3 in MRP-227, Revision 1. The examination coverage within this note was updated in MRP-227, Revision 1-A in accordance with the response to NRC RAI 29 (see Appendix D of MRP-227, Revision 1-A).</p> <p>Component note 10 from Table 4-3 of MRP-227, Revision 1 was removed from component W3 and W4 consistent with the notes included in response to NRC RAI 29. Note 10 from MRP-227, Revision 1 required expansion to the uninspected portion of the W3 and W4 welds during the same outage if significant flaws were found in the Primary inspection sample. The Primary Component coverage for W3 and W4 in Table 4-3 of MRP-227, Revision 1-A is 100% of the accessible weld length of one side of the weld (either side for W3 and the outer diameter for W4) instead of the 25% required in MRP-227, Revision 1. The change in coverage made Note 10 obsolete and unnecessary.</p>

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Table 1: Responses to U.S. NRC Staff Comments on MRP-227, Revision 1-A as Provided in [7] (cont.)

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5e	Confirmation of Changes to Tabular Footnote References for TR Tables 4-1 through 4-6 and 4-8 and 4-9	<u>Notes for Items W4.2 and W4.3 in TR Table 4-6.</u> For “Expansion” components associated with Item W4.2 (core barrel middle axial welds) and Item W4.3 (i.e., core barrel lower axial welds) in TR Table 4-6, the applicable note designations were renumbered from Notes 2 and 3 in TR Table 4-6 of the MRP-227, Rev. 1 report to Notes 3 and 4 in TR Table 4-6 of the draft MRP-227, Rev. 1-A report.	(Note 1)	<p>W4.2 and W4.3:</p> <p>Components W4.2 “Middle Axial Welds (MAW)” and W4.3 “Lower Axial Welds (LAW)” in Table 4-6 of MRP-227, Revision 1 included Note 2; however, the table did not include a Note 3, as indicated in [7].</p> <p>Note 2 was incorrectly referenced for W4.2 and W4.3 in Table 4-6 of MRP-227, Revision 1 because those components already indicated in the “Expansion Coverage” column that the inspection should be conducted from the outer diameter of the barrel because the inner diameter of the barrel is inaccessible for these two welds.</p> <p>Component Notes 5 and 6 were added into MRP-227, Revision 1-A for components W4.2 and W4.3 in accordance with the response to NRC RAI 29 (see Appendix D of MRP-227, Revision 1-A).</p>

Note:

- Unless addressed in subsequent paragraphs of this column entry, the staff requests that EPRI MRP confirm that changes to the note number designation or the contents of notes on TR Section Table component items were based on either: (1) administrative reshuffling of the notes, or (2) adjustments of the note criteria based on the EPRI MRP’s resolution of staff-issued requests for additional information (RAIs) on the MRP-227, Rev. 1 methodology, where the response bases were accepted by the staff.

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3 Recommendations for Utility Use of this Letter

Utilities that reference MRP-227, Revision 1-A may reference the applicable portions of this letter to resolve the following statement in the NRC verification letter for MRP-227, Revision 1-A [7]:

Any facility referencing MRP-227, Revision 1-A should address the items contained in the enclosure to this letter.

Most of these responses do not require changes to the reactor vessel internals aging management program of a particular facility and will not impact the contents of MRP-227, Revision 1-A. The only exception is for Item 1 in Table 1, which requires the correction of the component assembly naming of MRP-227, Revision 1-A Table 4-5 entry C1.1 “Core support column bolts” to be the “Lower Support Structure” instead of the “Core Shroud Assembly (Bolted)”. Note that this only applies to one currently-operating plant.

The applicability of the comments and comment responses in Table 1 are provided in Table 2 based on plant design.

Table 2: Plant Design Applicability of Comments and Comment Resolutions in Table 1

Plant Design	Comment Applicability and Actions
Babcock & Wilcox Plants	None of the comments are applicable. No further action needed.
Westinghouse Plants	Items 5a, 5b, 5d, and 5e are applicable. The note numbering changes were confirmed to be administrative, editorial adjustments and do not require further action beyond referencing the explanation provided in Table 1.
CE Plants (all designs)	<p>Items 1, 2, 3, 4, and 5c are applicable, depending on plant design:</p> <ul style="list-style-type: none"> • Item 1 – Applicable to CE plants with bolted core shroud assemblies (one currently-operating unit) <ul style="list-style-type: none"> ○ Requires an update to the component assembly naming for Expansion component C1.1 in Table 4-5 of MRP-227, Revision 1-A • Item 2 – Applicable to CE plants with a core support barrel lower flange flexure weld <ul style="list-style-type: none"> ○ Addressed in the comment resolution and does not require further action beyond referencing the explanation provided in Table 1 • Item 3 – Applicable to all CE plants <ul style="list-style-type: none"> ○ Addressed in the comment resolution and does not require further action beyond referencing the explanation provided in Table 1 • Item 4 – Applicable to CE plants with affected ICI thimble tubes-Lower <ul style="list-style-type: none"> ○ Addressed in the comment resolution and does not require further action beyond referencing the explanation provided in Table 1 • Item 5c – Applicable to all CE plants <ul style="list-style-type: none"> ○ Addressed in the comment resolution and does not require further action beyond referencing the explanation provided in Table 1

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4 References

1. *Materials Reliability Program: Pressurized Water Reactor Internals Inspection and Evaluations Guideline (MRP-227, Revision 1)*, EPRI, Palo Alto, CA: 2015, 3002005349.
2. Materials Reliability Program Letter, MRP 2015-040, "Report Transmittal: *Materials Reliability Program: Pressurized Water Reactor Internals Inspection and Evaluations Guideline (MRP-227, Revision 1)*", EPRI, Palo Alto, CA, 2015, 3002005349. Ref. EPRI Project Number 689," December 21, 2015. (ML15358A046)
3. Materials Reliability Program Letter, MRP 2017-004, "Transmittal of Corrections to EPRI Report 3002005349, Materials Reliability Program: Pressurized Water Reactor Internals Inspection and Evaluation Guidelines (MRP-227, Revision 1)," January 18, 2017. (ML17024A252)
4. U.S. Nuclear Regulatory Commission Safety Evaluation, "Final Safety Evaluation for Electric Power Research Institute Topical Report MRP-227, Revision 1, "Materials Reliability Program: Pressurized Water Reactor Internals Inspection and Evaluations Guideline," (CAC No. MF7223; EPID L-2016-TOP-0001)," April 25, 2019. (ML19081A001)
5. *Materials Reliability Program: Pressurized Water Reactor Internals Inspection and Evaluation Guidelines (MRP-227, Revision 1-A)*. EPRI, Palo Alto, CA: 2019. 3002017168.
6. Materials Reliability Program Letter, MRP 2019-033, "Submittal of MRP-227 Revision 1-A, Final Published Version Electric Power Research Institute Topical Report, entitled "Materials Reliability Program: Pressurized Water Reactor Internals Inspection and Evaluations Guideline," for US NRC Acceptance (CAC NO. MF7740)," December 3, 2019. (ML19339G364)
7. U.S Nuclear Regulatory Commission Letter, "U.S. Nuclear Regulatory Commission Verification Letter for Electric Power Research Institute Topical Report MRP-227, Revision 1, 'Materials Reliability Program: Pressurized Water Reactor Internals Inspection and Evaluations Guideline' (L-2019-TOP-0053)," February 19, 2020. (ML20006D152)
8. *Materials Reliability Program: Pressurized Water Reactor Internals Inspection and Evaluation Guidelines (MRP-227-A)*. EPRI, Palo Alto, CA: 2011. 1022863.