

Oconee Nuclear Station SLRA: Breakout Questions – PWR Internals Review

AMP: SLRA Appendix B, Section B2.1.7, “PWR Vessel Internals”

AMP FSAR Supplement: SLRA Section A2.7, “PWR Vessel Internals”

AMR Item Reference Table (Table 1s): Table 3.1.1

AMR Item Reference Table (Table 2s): Table 3.1.2-2

Assigned Technical Review Package (TRP): #16

Abbreviations Used in the TRP Question/Topic Table (Not Necessarily in Alphabetical Order):

Loss of fracture toughness: LOFT

Loss of Material: LOM

Stress Corrosion Cracking: SCC

Irradiation-Enhanced Stress Relaxation or Creep: ISR/IC

Thermal-Aging Embrittlement: TE

Control Rod Guide Tube: CRGT

Upper Core Barrel: UCB

Flow Distributor: FD

Lower Thermal Shield: LTS

Core Barrel: CB

Lower Fuel Grid: LFG

Locking Welds: LWs

Modified Locking Devices: MLDs

Baffle-to-Baffle: BB

Vent Valve: VV

Loss of preload: LOP

Changes in Dimension: CID

Irradiation-Assisted Stress Corrosion Cracking: IASCC

Neutron Irradiation Embrittlement: IE

Void Swelling: VS

Incore Monitoring Instrumentation: IMI

Lower Core Barrel: LCB

Upper Thermal Shield: UTS

Core Support Shield: CSS

Upper Fuel Grid: UFG

Locking Devices: LDs

Original Locking Devices: OLDs

Baffle-to-Former: BF

Core Barrel-to-Former: CB-F

Question/ Topic Number ⁴	SLRA Section	SLRA Page(s)	MRP-227, Rev. 1-A Table (T) Item References	Background / Issue (As applicable/needed)	Discussion Topic / Question / Request	
General Discussion Topics / Questions						
1	B2.1.7	B-65 – B-76	NA	<p>Topic:</p> <p><i>Gap Analysis Basis and WCAP-17096</i></p> <p>1. SLRA AMP B2.1.7 includes, summarizes and</p>	<p>1. The staff seeks clarification on whether there is a background gap analysis report that was used as the feeder for the relevant gap analysis information provided in SLRA Section B2.1.7. If so, the staff requests that the formal gap analysis (containing both methodology and results) be placed in the reference section of the audit portal directory for AMP B2.1.7. If not, identify the report or methodology from Item 1 list above</p>	

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				NOTE: The staff needs to emphasize its response to NEI Comment #1 in Appendix H of Interim Staff Guidance No. SLR-ISG-2021-01-PWRVI (ADAMS ML20217L203) regarding the use of MRP-189, Rev. 3 for PWR Vessel Internals Programs in B&W unit SLRAs.		
AMP Gap Analysis Statements Need Clarifications						
3	B2.1.7, Tables B2.1.7-1, B2.1.7-2, B2.1.7-3	B-67, B- 71 and B-73	MRP-227 Table 4-1 Items For Component- Specific "Primary" Locking Device Types: B4, B5, B6, B7, B8, B11, B12, and B14 ¹ MRP-227 Table 4-4 Items For Component- Specific	<u>Topic:</u> <i>Inspection Criteria for LDs, MLDs, or OLDs</i> The applicant states on these SLRA pages that, in general, the gap analysis "removed references to visual VT-3 examination of high strength bolt locking devices." This statement is very generic and may impact the	The topic will require an RAI. 1. Applicant is requested to identify any and all "Primary" and "Expansion" locking device components subject to this gap analysis statement, including corresponding line item entry in Table 4-1 or 4-4 of MRP-227, Rev. 1-A, and specific LD, OLD, or MLD component type. Applicant should be prepared to define and discuss its criteria for defining the material of a given bolt locking device as a high strength material. 2. For each specified LD, OLD or MLD component subject to this gap analysis statement, the applicant should be prepared to clarify whether the statement is either: (1) downgrading the applicant MRP-227, Rev. 1-A inspection category (Primary or	

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#3 Cont.			<u>"Expansion" Locking Device Types:</u> B7.1, B8.1, B11.1, and B15.1 ²	EPRI MRP Primary or Expansion protocols for specified LDs, OLDs, or MLDs in MRP-227, Rev. 1-A without fully defining them in the gap analysis tables of AMP B2.1.7. This statement may also conflict with the applicant's referenced EPRI MRP categorizations for specified LD, OLD, or MLD types in SLRA Table 3.1.2-2 (i.e., for AMR subitems of linked "Primary" category locking devices if referencing to SLRA Item 3.1.1-051a or 3.1.1-058a, or for AMR subitems of linked "Expansion" category locking devices if referencing to SLRA Item 3.1.1-051b or 3.1.1-058b).	Expansion) to "No Additional Measures" (NAM) category, (2) eliminating VT-3 inspection criteria and protocols for the LD, OLD, or MLD component type in Table 4-1 or 4-4 of MRP-227, Rev. 1-A, or (3) changing the acceptance criteria for the specified LD, OLD, MLD component(s) in Table 5-1 of MRP- 227, Rev. 1-A. If so, the applicant should discuss and provide its technical rationale for: (1) making the changes to the component-specific MRP-categorizations and inspection and evaluation (I&E) protocols, and (2) why the component-specific locking device changes are not reflected in SLRA AMP Tables B2.1.7-1, B2.1.7-2, or B2.1.7-3, as appropriate.	
4	B2.1.7, Tables B2.1.7-1, B2.1.7-2, B2.1.7-3	B-67, B-68	<u>For the referenced core clamping components:</u> T 4-1, Item B1.a (plenum cover weld rib pads) T 4-1, Item B1.b (plenum cover support flange)	<u>Topic:</u> <i>Gap Analysis Updates for "Primary" plenum cover and core support shield clamping devices</i> The applicant states that the initial physical measurements of the components have been completed and that no observable indications	Staff requests identification of the outages or years that the initial physical measurements were performed. Is there a summary report for the physical measurements that can be posted to the portal? No Audit Question on VT-3 reinspection frequency; they are consistent with Item B1 in Table 4-1 of MRP-227, Rev. 1-A (i.e., no audit questions).	

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			<p>T 4-1, Item B1.c (plenum cover support ring)</p> <p>T 4-1, Item B1.d (core support shield [CSS] top flange)</p>	<p>were noted from the measurements. Applicant also indicates subsequent VT-3 visual inspections to be performed on a 10-year reinspection frequency.</p> <p>Applicant also updated the coverage bases for the core clamping components.</p>		
<p>5</p> <p>#5 Cont.</p>	<p>B2.1.7, Tables B2.1.7-1, B2.1.7-2, B2.1.7-3</p>	<p>B-68, B-71, and B-73</p>	<p>T 4-4, Item B2.1, Vent Valve Bodies (Expansion)</p>	<p><u>Topic:</u></p> <p><i>Change in EPRI MRP Category for Vent Valve (VV) Bodies</i></p> <p>On these SLRA pages, the applicant identified that the gap analysis resulted in a component-specific inspection category change for the VV bodies (i.e. from "Expansion" category to the "No Additional Measures" [NAM] category of the AMP). The applicant states that this component-specific inspection category change is based on the methods in MRP-189, Rev. 3, which concluded that the VV bodies are not susceptible to LOFT/TE. The applicant also articulates that, for the 80-year program, there is no "Expansion" category component for the "Primary" CRGT spacer castings (Item B2 in Table 4-1, MRP-227, Rev. 1-A).</p>	<p>Applicant should be prepared to discuss the basis in MRP-189, Rev. 3 that supports the basis that the VV bodies are not susceptible to thermal- aging embrittlement (TE) or neutron embrittlement (IE) mechanisms. The applicant should also be prepared to discuss any inservice testing (IST) requirement protocols for the VV assemblies that may factor into the applicant's decision to downgrade the VV bodies to NAM status. Additionally, if the VV bodies are no longer "Expansion" category components, why doesn't this reflect in a modification of Item B2 for the CRGT spacer castings in both SLRA Tables B2.1.7-1 and B2.1.7-3 and a deletion of Item B2.1 for the vent valve bodies in SLRA Table B2.1.7-2, along with appropriate justifications for deleting the VV body "Expansion" links in all of the tables?</p> <p>If the VV bodies will no longer be categorized as "Expansion" components for the "Primary" category CRGT spacer castings, the applicant should also be prepared to discuss whether there is another CASS RVI component that might serve as an alternative, more reasonable CASS, martensitic stainless steel, or precipitation hardened stainless steel "Expansion" category component in the ONS RVI design that can be applied as a new "Expansion" link to the "Primary" category CRGT spacer castings in lieu of the VV bodies.</p> <p>Refer to Question/Issue Topic #33 for rectifying this issue against the SLRA Table 3.1.2-2 AMR item for the VV bodies on SLRA Page 3-132.</p>	

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#5 Cont.				<p>This gap analysis change conflicts with the AMR item for the VV bodies in SRLA Table 3.1.2-2, where the applicant identifies the VV bodies are "Expansion" category components through reference to SRLA Item 3.1.1-058b (SLRA page 3-132). In SLRA AMP B2.1.7, the applicant has reported some ONS-specific cases of cracking being detected in some of the VV components.</p> <p>NOTE: See Table Note 4 in regard to use of MRP-189, Rev. 3 for PWR RVI component-specific screening objectives.</p>		
6	B2.1.7, Tables B2.1.7-1, B2.1.7-2, B2.1.7-3	B-68	<p>T 4-1, Item B7, Upper Core Barrel (UCB) Bolts and Bolt Locking Devices (Primary);</p> <p>T 4-1, Item B8, Lower Core Barrel (LCB) Bolts and Bolt Locking Devices (Primary);</p> <p>T 4-1, Item B12, Flow Distributor (FD) Bolts and Bolt Locking Devices (Primary)</p>	<p><u>Topic:</u></p> <p><i>EPRI MRP "Primary" Criteria for UCB, LCB, and FD Bolts and "Primary-to-Expansion" Criteria for UTS and LTS Bolts</i></p> <p>The applicant states that an "Expansion" link was created for these "Primary" bolting types to expand to upper thermal shield (UTS) and lower thermal shield (LTS) bolts when triggered by MRP-227, Rev. 1-A. The applicant appears to limit the "Expansion" basis only to</p>	<p>This matter may require an RAI.</p> <p>The EPRI MRP identifies that the UCB, LCB, and FD bolts are susceptible to both SCC and fatigue cracking mechanisms. The staff will need clarifications and justifications for the SLRA docketing on why the need for triggering "Expansion" to the UTS and LTS bolts is limited only to crack indications that are confirmed to be initiated by SCC in either the UCB, LCB, or FD bolts and why cracking initiated by fatigue or cyclic loading in the UCB, LCB, or FD bolts would not trigger the expansions.</p> <p>NOTE: Discussion bases and questions in regard to the final categorizations of UCB, LCB, FD, UTS and LTS bolt locking devices are the topic of Topic/Question #3.</p>	

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#6 Cont.			<p>T 4-4, Item B7.1, Upper Thermal Shield (UTS) Bolts and Bolt Locking Devices (Expansion);</p> <p>T 4-4, Item B8.1, Lower Thermal Shield (LTS) Bolts and Bolt Locking Devices (Expansion);</p>	<p>cracks that are detected and confirmed to initiate by an SCC mechanism.</p> <p>In Items B7, B8, and B12 in Table 5-1 of MRP-227, Rev. 1-A, the EPRI MRP established its basis for triggering "Expansion" to UTS and LTS bolts based on exceeding 10% bolts (including previously failed/removed bolts) with confirmed, unacceptable conditions. The EPRI criteria for "triggering" "Expansion" to the LTS or UTS bolts do not appear to be limited the need for triggering "Expansion" only to crack indications that initiate solely by an SCC mechanism.</p>		
7	B2.1.7, Tables B2.1.7-1, B2.1.7-2, B2.1.7-3	B-68	<p>T 4-1, Item B9, Baffle-to-Former (BF) Bolts (Primary);</p> <p>T 4-4, Item B9.2, Barrel-to-Former Bolts (Expansion); the applicant refers to these bolts as the core barrel-to-former (CB-F) bolts</p>	<p><u>Topic:</u></p> <p><i>Gap Analysis Change to BF and CB-F Bolts</i></p> <p>Page B-68 includes the following gap analysis statement:</p> <p><i>"An expansion link note was added for the core barrel assembly, baffle-to-former bolts (Item B9). The note states that the core barrel-to-former bolts are Category A for void swelling, so expansion does not apply."</i></p>	<p>This matter may require an RAI.</p> <p>The staff seeks a clarification on whether the gap analysis (as currently proposed in the SLRA) is downgrading the inspection category for the CB-F bolts to the "No Additional Measures" category of components. If this is the case, the staff seeks a technical justification for downgrading the CB-F bolts into the "No Additional Measures" category and why the changes aren't reflected and defined in SLRA Tables B2.1.7-1, B2.1.7-2, or B2.1.7-3 (as applicable and appropriate), given that CB-F bolts were placed into the "Expansion" category based on an assessment of the consequences of aging mechanisms of IASCC, wear, fatigue, IE, and ISR/IC, and not on the consequences of VS.</p> <p>NOTE: Discussion bases and questions in regard to the final inspection categorizations for BF bolt locking devices, internal</p>	

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#7 Cont.				<p>It is not evident whether these gap analysis statements are placing the CB-F bolts in the “No additional Measures” category for the 80-Year program.</p> <p>The staff has confirmed that, in Table 3-1 of MRP-227, Rev. 1-A, the CB-F bolts were placed into Category A, but only for the aging mechanisms of VS, SCC, and TE. For IASCC, wear, fatigue, IE and ISR/IC, the EPRI placed the CB-F and baffle-to-baffle (BB) bolts in the higher B or C categories, which prompted the EPRI MRP to establish the CB-F and BB bolts as the two “Expansion” components for the “Primary” BF bolts.</p>	BB bolt locking devices, external BB bolt locking devices, and CB-F bolt locking devices are the topic of Topic/Question #3.	
8	B2.1.7, Tables B2.1.7-1, B2.1.7-2, B2.1.7-3	B-68, B- 70	<p>T 4-1, Item B10, Baffle Plates (Primary);</p> <p>T 4-4, Item B10.1, Core Barrel Cylinder, including vertical and center circumferential seam welds (Expansion);</p> <p>T 4-4, Item B10.2, Former Plates (Expansion);</p>	<p><u>Topic:</u></p> <p><i>Expansion Categories for the CB Cylinder Seam Welds</i></p> <p>On page B-68, the applicant makes the following gap analysis statements:</p> <p><i>“Expansion links for the core barrel assembly, baffle plates (Item B10) were revised. Core barrel cylinder (including vertical and circumferential seam welds) and lower grid rib section</i></p>	<p>Some or all of these topics may require RAIs.</p> <p>1. The staff seeks clarification on whether the design of the CB cylinder at ONS Units 1, 2, and 3 includes applicable axial/vertical seam welds.</p> <p>2. The staff seeks confirmation that Duke Energy has confirmed that the CB cylinder top flange circumferential (girth) seam weld and center girth seam weld at ONS Unit 2 are at least partially accessible to EVT-1 Inspection equipment (given that EPRI claims the welds are inaccessible for inspection). If at least partially accessible, the staff seeks clarification on the minimum percentage of achieved seam weld length that can be credited for the Unit 2 component-specific “Primary” inspections of the girth welds and maintaining structural integrity of the welds.</p>	

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#8 Cont.			T 4-4, Item B10.3, Lower Grid Rib Sections (Expansion)	<p><i>were removed as expansion links. Former plates were retained as an expansion link."</i></p> <p>The staff understands the removal of the lower grid rib sections as a cited "Expansion" component for the baffle plates, as the rib sections are being upgraded to "Primary" category components in the gap analysis Tables B2.1.7-1 and B2.1.7-3. However, the staff seeks further discussions on the basis for removing the CB cylinder circumferential welds (girth welds) and vertical welds (axial welds) as cited "Expansion" linked components for the "Primary" category baffle plates.³ Specifically the gap analysis has upgraded the CB cylinder top flange circumferential weld and center circumferential weld to "Primary" category components in SLRA Table B2.1.7-1, but only for ONS Unit 2.</p> <p>This implies that the CB cylinder girth welds for ONS Units 1 and 3 and the CB cylinder axial welds for ONS Units 1, 2, and 3 (if they exist in the unit-specific designs) are being placed in the "No</p>	<p>The staff requests further technical details and clarifications on whether the core barrel cylinder circumferential (girth) seam welds for ONS Units 1 and 3 and the core barrel cylinder vertical (axial) seam welds for ONS Units 1, 2, and 3 are being placed in the "No Measures Category" versus the current basis that establishes these welds as "Expansion" category links for the "Primary" baffle plate inspections. For instance, if these welds are no longer "Expansion" components, why doesn't this reflect as deleted B10.1 line item components for SLRA Table B2.1.7-2?</p> <p>The same type of comment applies to the lower grid sections, which now appropriately show up as "Primary" components for SLRA Tables B2.1.7-1 and B2.1.7-3, but were not designated as deleted "Expansion" category components for SLRA Table B2.1.7-2.</p> <p>NOTE: See Question/Topic Item #21 for related audit questions/topics on the SLRA Table 3.1.2-2 AMR items for CB cylinder components.</p>	

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				Additional Measures” category of components. This also appears to imply that the Unit 2 CB cylinder top flange girth weld and center girth weld are a least partially accessible to EVT-1 visual inspection equipment (which is contrary to EPRI MRP’s claims that these welds are inaccessible to inspection).		
9 #9 Cont.	B2.1.7, Tables B2.1.7-1, B2.1.7-2, B2.1.7-3	B-69	T 4-1, Item B15, IMI Guide Tube Spiders and Spider-to-Lower Grid Rib Section Welds (Primary)	<p><u>Topic:</u></p> <p><i>Gap Analysis Criteria for “Primary” IMI Guide Tube Spiders and Spider-to-Lower Grid Rib Section Welds</i></p> <p>In the gap analysis results, the applicant identifies that thermal aging embrittlement (TE) was removed as an applicable aging mechanism for the referenced spiders.</p>	<p>The staff seeks confirmation that this change leaves IE as the sole mechanism for the referenced IMI guide tube spiders. The staff also seeks identification of the site specific document (for placement on the portal) that assessed the ferrite content for the spider material of fabrication (i.e., cast austenitic stainless steel [CASS]) and concluded that the CASS materials are not susceptible to TE.</p> <p>NOTE: Staff has confirmed that the new acceptance and expansion criteria for the IMI guide tube spiders and spider welds in SLRA Table B2.1.7-3 are appropriate.</p>	
Operating Experience Results and Program Assessments (including Self Assessments and INPO Assessments)						
10	B2.1.7	B-78	T 4-4, Item B10.3, Lower Grid Rib Sections, (Expansion) [However, Upgraded to	<p><u>Topic:</u></p> <p><i>2014 Lower Grid Rib Section Inspection Results (ONS Unit 1).</i></p> <p>Item 2 in the discusses an flaw indication that was</p>	<p>Although the staff has no questions on the upgrading of the lower grid rib sections to “Primary” category status, the staff seeks additional details on the flaw evaluation used to assess the rib sections and the impacted LGF assembly.</p> <p>Applicant should be prepared to identify and discuss the flaw evaluation used to assess the condition in the degraded lower grid rib section and support operability of the LGF assembly for</p>	

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			"Primary" in SLRA Gap Analysis]	detected in one of the lower grid rib sections at Unit 1. The PWROG did not include any acceptance criteria or data analysis criteria for evaluations of flaw indications in B&W-design lower grid rib sections in WCAP-17096-NP-A, Rev. 2, as the PWROG only defined and established these criteria in the current WCAP-17096, Rev. 3 (which is currently undergoing and pending a staff review).	continued service beyond 2014. This should include identification of the reinspection interval being applied to the lower grid rib sections. The staff requests that the applicant post the flaw evaluation to the portal. Has EPRI MRP been notified of this OE?	
11	B2.1.7	B-78, B-79, B-80	T 4-1, Item B9 for BF bolts, and Item B11 for BF bolt locking devices and Internal BB bolt locking devices (Primary) T 4-4, Item B9.1 for BB bolts, Item B9.2 for CB-F bolts, and Item B11.1 for external BB bolt locking device and CB-F bolt locking devices	<u>Topic:</u> <i>ONS-Specific BF Bolt and CB-F Bolt OE</i> On page B-78, the applicant states: <i>"Evaluation in 2016 for potential impacts to ONS found that the ONS Internals design does not present the same characteristics that are attributed to the baffle-to-former bolt failures observed in certain Westinghouse units. It was concluded that the MRP-227 guidance concerning baffle-to-former bolt inspections was adequate at the time, and no additional actions were necessary."</i> In contrast to the generic OE, the applicant identifies	The applicant should be prepared to discuss the technical evaluation that was performed on the ONS-1 and ONS-3 BF bolts and BF assemblies and address the following questions: 1. Has the crack-like OE with the referenced BF bolts and CB-F bolts been disseminated to the EPRI MRP for evaluation and has the EPRI MRP issued any revised I&E recommendations for B&W-design BF and CB-F bolting types. Have the BF bolts with flaw indications at ONS Unit 1 and Unit 3 and the CB-F bolt at Unit 3 been repaired or replaced? 2. What type of technical analysis (e.g., use of an acceptable bolting pattern analysis [ABPA] and risk-informed, probabilistic bolting pattern sets in comparison to the ABPA) was performed on the degraded BF bolts and the baffle-former assemblies at Unit 1 and has it been submitted for staff review? The staff requests that analysis be posted to the audit portal (i.e., if one exists for the CLB). 3. Has similar degradation been detected in the BF bolts of ONS Units 2? If so, how was the degradation in the Unit 2 bolts dispositioned? 4. What is the current reinspection interval for the BF bolts at ONS Unit 1, versus the reinspection interval for the baffle-to-	

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11 Cont.				<p>on Page B-79 that 25 BF bolts in Unit 1 have crack-like UT indications (2020 ISI), one BF bolt in Unit 3 had a cracklike indication (2014 ISI) However, the applicant does not provide any discussion of the plant-specific technical evaluation(s) that was (were) performed on the BF assembly (assemblies) in light of the site specific degradation that was detected in the referenced BF bolts for ONS Unit 1 or Unit 3.</p> <p>The applicant also identifies that one BF bolt in Unit 2 was not inspectable during the UT examinations performed in 2013 and four BF bolts in Unit 1 were not inspectable during the UT examinations performed in 2020. The applicant reports that it detected a crack in one of the Unit 1 BF bolt locking devices in in 2020.</p> <p>The applicant also reports that one CB-F bolt in Unit 2 was un-inspectable in 2013 due to improper bolt seating and that one CB-F bolt in Unit 3 had a crack-like indication from the Year 2014 ISI.</p>	<p>former bolts at ONS Units 2 and 3? Justify any differences in the reinspection intervals for these bolts.</p> <p>5. For the uninspected BF bolts in Units 1 and 2 and the un-inspectable CB-F bolt in Unit 2, was the applicant capable of re-inspecting them at a later time and if so, did the applicant ever get the opportunity to go back and inspect the bolts? If so, summarize the inspection results for the UT inspection performed on the bolts, If not, the applicant should be prepared to clarify how were these bolts were dispositioned in terms of the overall baffle-to-former assembly operability assessment for the impacted units. For permanently inaccessible BF bolts, does the applicant assume the bolts are failed bolts with indications?</p> <p>6. In order to determine whether “expansion” is needed to the BB or CF-F bolts, how do the 25 BF bolts with indications in Unit 1 compare the EPRI MRP’s “Expansion” acceptance criterion of 5% bolts with unacceptable indications (including previously failed/removed bolts) in Item B9 of Table 5-1 in MRP-227, Rev. 1-A.</p> <p>Additionally, has B&W, Framatome, or AREVA established any “Expansion” criteria for B&W-design BF bolts based on bolt clustering criteria and has any any clustering of failed BF bolts at Unit 1 been detected from the most recent 2020 inspections? If so discuss the basis for disposition of the degree of clustering detected in the bolts with flaw indications and clarify how that impacts the structural integrity of the BF assembly at Unit 1. For Unit 1, has “Expansion” to the BB bolts and CF-B bolts been triggered as a result of total number of bolts (i.e., 25 bolts) detected with indications or as a result of bolt clustering?</p> <p>NOTE: Discussion bases and questions in regard to the final inspection categorization of the BF bolt locking devices, internal and external BB bolt locking devices and CB-F bolt locking devices are the topic of Topic/Question #3. There will</p>	

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11 Cont.					be an RAI on categorizations of both "Primary" and "Expansion" category bolt locking devices.	
12	B2.1.7	B-79, B-80	T 4-1, Item B6, Modified Vent Valve (VV) Locking Devices (bolt locking cup, jackscrew locking cup, and bolted block; Primary components)	<p><u>Topic:</u></p> <p><i>Vent valve (VV) jack screw operating experience.</i></p> <p>The applicant summarizes issues (e.g., detection of cracklike indications) with VV jack screw locking devices detected during the Unit 1</p>	Given the topic of Audit Discussion Topic #3, the applicant should be prepared to identify whether the VV modified locking devices (including the jack screw locking devices) are being placed in the "No Additional Measures" category, and if so, justify the basis for placing the locking devices in the "No additional Measures" category, particularly in light of the jackscrew locking device experience detected in Units 1, 2, and 3.	

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13 Cont.				<p>The applicant reports crack-like indications that were detected two Unit 2 FD bolts in 2013.</p>	<p>3. In light of the evaluations of the detected crack-like indications in the LCB bolts, UCB bolts and FD bolts, what is the reinspection interval for the LCB bolts, UCB bolts, and FD bolts going forward and what is the technical justification basis for the reinspection interval being selected?</p> <p>4. Applicant to discuss and confirm that need for "Expansion" to the LTS and UTS bolts was not triggered by the number of LCB bolts, UCB bolts, or FD bolts with detected conditions, or by detected LCB, UCB, or FD bolt clustering levels (if applicable).</p> <p>NOTE: Discussion bases and questions in regard to the final inspection categorization of the UCB, LCB, FD, UTS, and LTS bolt locking devices are the topic of Topic/Question #3.</p>	

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14	B2.1.7	B-80	T 4-1, Item B15, IMI guide tube spiders and spider- to-lower grid rib section welds (Primary components).	<p><u>Topic:</u></p> <p><i>IMI guide spider and spider weld OE.</i></p> <p>The applicant reports crack-like indications one IMI guide tube spider and spider weld at ONS Unit 3 as a result of inspections performed in 2014.</p>	<p>1. Similar to other OE discussions, applicant should be prepared to address the relevant experience with the Unit 3 IMI guide tube spider and spider weld, including the type of technical evaluation of the IMI guide tube assembly that was performed and used to support functionality of the IMI guide tube assembly for further service, identification and justification of the reinspection interval that will be used for the IMI guide tube spiders and spider welds going forward.</p> <p>2. Applicant to confirm that the IMI guide tube spider and spider weld inspections performed at Units 1, 2, 3 did not result in any need for "Expansion" to the lower grid fuel assembly lower support pad Items (i.e., to the support pad, pad to rib section welds, Alloy X-750 dowel, caps screw and their locking devices; Item B15.1 components in Table 4-4 of MRP-227, Rev. 1-A).</p>	
Component Specific AMR Items in SLRA Table 3.1.2-2 or in Appendix C of AMP Basis Report No. SLR-ONS-AMPR-XI.M16A						
15	Table 3.1.2-2 B2.1.7	3.1-110, 3.1-111	T 4-1, Item B9, Baffle-to-former bolts (Primary components)	<p><u>AMR Commodity Grouping:</u></p> <p><i>Baffle/Former Bolts and Screws.</i></p> <p>1. Table 3.1.2-2 include a plant-specific Note F line items on cracking, loss of material due to wear, loss or preload due to irradiation-assisted stress relaxation or creep (ISR/IC), and loss of fracture toughness due to irradiation embrittlement (IE) for those components in the Commodity Grouping that are made from Nickel-Alloy materials.</p> <p>2. In SLRA AMP page B-67, the applicant make the following gap analysis</p>	<p>1. Applicant should identify which components in the "Baffle/Former Bolts and Screws" commodity grouping are specifically made from Nickel Alloy material.</p> <p>Applicant to confirm, that if made from Nickel Alloy under Note F: (1) that baffle-to-former (BF) bolts, BF bolt locking devices, and internal baffle-to-baffle (BB) bolt locking devices are still EPRI MRP "Primary" category components, and (2) the core barrel-to-former (CB-F) bolts, BB bolts, and CB-F and BB bolt locking devices remain as "Expansion" category components.</p> <p>2. Identify which of the bolt locking devices in the applicable commodity group (including internal and external BB locking device types) are impacted by this gap analysis change and clarify whether the gap analysis statement is effectively causing a change in the EPRI MRP-defined component category or I&E criteria for the impacted locking device types.</p> <p>If the generic gap analysis statement is impacting the component category or I&E criteria for a given BF, internal or external BB, or CB-F bolt locking device type, identify the new category for the locking device item type and rectify the</p>	

Question/ Topic Number ⁴	SLRA Section	SLRA Page(s)	MRP-227, Rev. 1-A Table (T) Item References	Background / Issue (As applicable/needed)	Discussion Topic / Question / Request	
#15 Cont.				change: " <i>General: removed visual VT-3 of high strength bolt locking devices.</i> "	difference for the inspection category for the locking device type in the AMR subitem of the commodity grouping (i.e., "Primary" for the BF bolt locking devices and internal BB bolt locking devices through reference to GALL-SLR Item IV.B4.RP-241a and SLRA Item 3.1.1-051a for cracking or to GALL-SLR Item IV.B4.RP240a and SLRA Item 3.1.1-058a for non-cracking effects; Expansion" for CB-F bolt locking devices or external BB bolt locking devices through reference to GALL-SLR Item IV.B4.RP-244 and SLRA Item 3.1.1-051b for cracking or to GALL-SLR Item IV.B2.RP-243a and SLRA Item 3.1.1-58b for non-cracking effects) and that specified for the bolt locking device type in the gap analysis. Justify why the change in category or I&E basis for the specified bolt locking devices has not been incorporated into SLRA AMP B2.1.7, Table B2.1.7-1, B2.1.7-2 or B2.1.7-3 as appropriate.	
16	Table 3.1.2-2	3-113, 3-114, 3-118, 3-121, 3-123, 3-126, 3-127, 3-128, 3-129, 3-130	NA	<p><u>NAM-Based AMR Commodity Groupings (Referenced to GALL-SLR Item IV.B4.RP-236 and SLRA Item 3.1.1-055a):</u></p> <ul style="list-style-type: none"> a. <i>Bottom Flange-to-Upper Grid Screws;</i> b. <i>Clamping Ring;</i> c. <i>Control Rod Guide Tube Flange-to-Upper Grid Screws;</i> d. <i>CRGT Pipe and Flange;</i> e. <i>CRGT Rod Sectors;</i> f. <i>CRGTs;</i> g. <i>Flow Distributor Head and Flange;</i> 	These components in these commodity groupings are normally NAM in MRP-277, Rev. 1-A because they are not referenced as "Primary" category components in Table 4-1 of the MRP report or "Expansion" category components in Table 4-4 of the MRP report – this is regardless of whether they are listed as NAM components in Table 3-1 of the report. For each one of these commodity groups, is there any ONS-site specific reason to elevate them from NAM to Primary or Expansion category status (i.e. with defined site-specific I&E protocols, and if elevated to Expansion with defined Primary-to-Expansion category links in the SLRA gap analysis – for example, as a result of age-related indications (OE) detected in the components from any past inspections performed on the components)?	

Question/ Topic Number ⁴	SLRA Section	SLRA Page(s)	MRP-227, Rev. 1-A Table (T) Item References	Background / Issue (As applicable/needed)	Discussion Topic / Question / Request	
#16 Cont.				<p> <i>h. Incore Guide Support Plate;</i> <i>i. Lower Grid and Shell Forgings;</i> <i>j. Lower Grid Flow Distributor Plate</i> <i>k. Lower Grid Rib-to-Shell Forging Screws;</i> <i>l. Orifice Plugs</i> <i>m. Outlet and Vent Valve Nozzles;</i> <i>n. Plenum Cylinder;</i> <i>o. Reinforcing Plates;</i> <i>p. Rib-to-Ring Screws;</i> <i>q. Shock Pads and Bolts;</i> <i>r. Support Post Pipes;</i> <i>s. Surveillance Specimen Holder Bolts;</i> <i>t. Thermal Shield (cylinders);</i> <i>u. Top Flange-to-Cover Bolts;</i> <i>v. Upper Grid Rib Forging;</i> <i>x. Supper Grid Rib Section</i> </p> <p>For some of these commodity groupings, it is not evident which RVI assemblies contain the referenced components.</p>	<p>The staff also requests identification of the assemblies containing the following commodity group listings: (1) clamping ring on page 3-113; (2) orifice plugs on page 3-126; (3) reinforcing plates and rib-to-ring screws on page 3-128, (4) support post pipes on page 3-129, and (5) top flange-to-cover bolts on page 3-130.</p>	
17	Table 3.1.2-2 B2.1.7	3-114	T 4-1. Item B2, CRGT Spacer Castings (Primary components)	<p><u>AMR Commodity Groupings:</u></p> <p><i>Control Rod Guide Tube Components (CRGT) Spacer Castings; CRGT Spacer Screws.</i></p> <p>On SLRA page 3.1-114, the applicant includes an AMR item for LOFT/TE in the</p>	<p>Given that Item B2 in Table 4-1 of the MRP-227, Rev. 1-A report calls for the VT-3 inspections to be performed at accessible surfaces at the CRGT spacer screw locations, clarify why there is a separate NAM-based line item for the CRGT spacer screws, and instead why the CRGT spacer screws are not included as components within the scope of the AMR item commodity grouping for the applicable "Primary" category CRGT spacer castings.</p>	

Question/ Topic Number ⁴	SLRA Section	SLRA Page(s)	MRP-227, Rev. 1-A Table (T) Item References	Background / Issue (As applicable/needed)	Discussion Topic / Question / Request	
				<p>"Primary" CRGT spacer castings. The SLRA page also includes an NAM-based line item for the CRGT spacer screws (as linked to SLRA Table 1 Item 3.1.1-055a).</p> <p>The staff has confirmed that the EPRI MRP I&E criteria for the CRGT spacer castings in Item B2 of Table 4-1 in MRP-227, Rev. 1-A call for primary VT-3 visual inspections of the <i>"accessible surfaces at each of the four screw locations (at every 90°) of 100% of the CRGT spacer castings."</i></p>		
18	Table 3.1.2-2 B2.1.7	3-115	T 4-4, Item B10.1, CB Cylinder, including vertical and center circumferential seam welds (Expansion components)	<p><u>AMR Commodity Grouping:</u></p> <p><i>Core Barrel (CB) Cylinder</i></p> <p>In MRP-227, Rev. 1-A, the EPRI MRP identifies that B&W CB cylinders (including the referenced, applicable seam welds in the cylinder) are "Expansion" category components that are linked to the "Primary" category inspections of the core baffle plates (Item B10 in Table 4-1 of MRP-227, Rev. 1-A for the Primary baffle plates).</p>	<p>This supplements the discussion topics for Question/Topic Item #9.</p> <p>1. The applicant should be prepared to explain why SLRA AMP B2.1.7, "PWR Vessel Internals," Table B2.1.7-1 does not include line item entries for the CB cylinder base metal shell portions of the cylinders in Units 1, 2, and 3, CB cylinder circumferential seams welds in Units 1 and 3, and if the CB cylinders include axial seam welds, line item entries for the axial seam welds in Units 1, 2, and 3. Also, using the example for the Unit 2 entries in Table B2.1.7-1, if the category for the CB cylinder and cylinder seam welds is changing from "Expansion" to "Primary," shouldn't there be corresponding line item <i>"deletion"</i> entries in SLRA Table B2.1.7-2 and wouldn't the inspection/evaluation criteria for the cylinders need to be redefined in SLRA Table B2.1.7-3?</p>	

Question/ Topic Number ⁴	SLRA Section	SLRA Page(s)	MRP-227, Rev. 1-A Table (T) Item References	Background / Issue (As applicable/needed)	Discussion Topic / Question / Request	
#18 Cont.				<p>The staff's existing line items for the "Expansion" category CB cylinder and associated cylinder seam welds are GALL-SLR Item IV.B4.RP250a for cracking due to SCC and fatigue (as linked to SRP-SLR Table 3.1-1 Item 051b) and Item IV.B4.RP250 for LOFT/IE (as linked to SRP-SLR Table 3.1-1 Item 058b). The referenced GALL-SLR items were not updated in the ISG.</p> <p>In the gap analysis (SLRA Page B-71, the applicant states: <i>"Core barrel cylinder (including vertical and center circumferential seam welds) (Item B10.1) was reclassified as "No additional Measures" for ONS Unit 1 and ONS Unit 3. The vertical seam welds were also reclassified as "No Additional Measures" for ONS Unit 2. The top flange circumferential weld heat affected zone and center circumferential weld region were reclassified as Primary Items for ONS Unit 2 only."</i> Thus, it appears that the applicant has only elevated the CB cylinder and cylinder girth welds in Unit 2 to Primary" category status by updating SLRA Table B2.1.7-1 accordingly. However, no technical basis</p>	<p>2. In addition, the line item entries for the CB cylinder components in SLRA Table B2.1.7-1 imply that any seam welds in the ONS CB cylinders are accessible for the EPRI MRP defined EVT-1 visual inspections of the cylinder welds, which is contrary to the EPRI MRP's claims in Item B10.1 of Table 4-4 in MRP-227, Rev. 1-A that the seam welds in the CB cylinder are not accessible to inspections. Thus, the applicant should be prepared to discuss whether the CB cylinder and cylinder seam welds (independent of gap analysis elevation to "Primary" status or downgrading to NAM status) are accessible to visual inspection equipment and whether the cylinder and cylinder seam welds are being managed using condition monitoring techniques or analysis-based, or mitigative/preventive-based aging management criteria. If condition monitoring (i.e., inspection) is being applied to the cylinders, the applicant should be prepared to define and justify the inspection methods and reinspection inspection frequency that will be applied to the cylinders and cylinder seam welds (as appropriate for SLRA Table B2.1.7-1, B2.1.7-2, or B2.1.7-3), as they are not defined in Item B10.1 of Table 4-4 in MRP-227, Rev. 1-A.</p> <p>3. For fracture toughness of the CB cylinder, SLRA Table 3.1.2-2 cites GALL-SLR AMR Item IV.B4.RP-249 and NEI Note D LOFT/IE of the baffle plates. Why not reference GALL-SLR Item IV.B4.RP-250 under NEI Note B, which is the staff's LOFT/IE line item for the CB cylinders as "Expansion" components in the ISG, or using GALL-SLR Item IV.B4.R-424 (as updated in the ISG and linked to SRP-SLR Table 3.1-1, Item 3.1.1-119) and NEI Note A or B, which could be used if the inspection category for the CB cylinders and associated seam welds was being elevated to "Primary" status?</p> <p>See Table Note 3 regarding current the EPRI MPR I&E criteria for B&W design CB cylinders and cylinder seam welds.</p>	

Question/ Topic Number ⁴	SLRA Section	SLRA Page(s)	MRP-227, Rev. 1-A Table (T) Item References	Background / Issue (As applicable/needed)	Discussion Topic / Question / Request	
#18 Cont.				<p>has been provided for downgrading the CB cylinder and cylinder girth welds in Units 1 and 3 from Expansion to NAM status, or the CB cylinder axial welds in Units 1, 2, and 3 to NAM status (if they exist in the CB cylinder design).</p> <p>In contrast, for the AMR line items of the CB cylinders on SLRA page 3-115, it appears that the applicant has elevated the CB cylinder components and their applicable seam welds to "Primary" category status by cross-referencing the component-specific AMR sub-items (i.e., those linked to AMP B2.1.7) to either SLRA Items 3.1.1-051a or 3.1.1-058a; this is independent of ONS unit specificity.</p>		
19	Table 3.1.2-2 B2.1.7	3-115, 3-116	T 4-4, Item B7.1, Upper Thermal Shield (UTS) Bolts and Bolt Locking Devices (Expansion components)	<p><u>AMR Commodity Grouping:</u></p> <p><i>Core Barrel-to-Thermal Shield Bolts</i></p> <p>1. For the referenced SLRA Table 3.1.2-2 AMR commodity grouping, the item includes AMR B2.1.7-based subitems that are referenced to GALL-SLR Items IV.B4.RP-246c, -246d,</p>	<p>Applicant to confirm that this commodity group only covers the upper thermal shield (UTS) bolts and bolt locking devices, and that the corresponding AMR commodity grouping covering the lower thermal shield (LTS) bolts and bolt locking devices are given on SLRA pages 3-125 and 3-126.</p> <p><u>1. and 2. COVERING UTS BOLT LOCKING DEVICE CATEGORY:</u> The staff has yet to see any justification or technical basis for moving any Primary or Expansion category bolt locking device components into the "No Additional Measures" category, including the categorizations of the UTS bolt locking devices if they are made from high strength</p>	✓

Question/ Topic Number ⁴	SLRA Section	SLRA Page(s)	MRP-227, Rev. 1-A Table (T) Item References	Background / Issue (As applicable/needed)	Discussion Topic / Question / Request	
#19 Cont.				<p>and -246e (as updated in the ISG). These GALL-SLR items as updated in the ISG) cover cracking of the "Expansion" category LTS bolts, cracking of the Expansion category LTS bolt locking devices, and CID and LOFT in the Expansion category UTS bolt locking devices, respectively.</p> <p>2. In the AMP gap analysis (SLRA Page B-67, See Question/Topic Item #3 Topic), the applicant states: <i>"General: removed visual VT-3 examination of high strength bolt locking devices."</i> Thus, in the gap analysis, the applicant would appear to be removing the UTS bolt locking devices as "Expansion" category components if the locking devices were categorized as being fabricated from high-strength materials.</p> <p>3. For the referenced SLRA Table 3.1.2-2 AMR commodity grouping, the applicant also includes AMR subitems referenced to GALL-SLR Items IV.B4.RP-248, -248a, and -248b (the "RP-248" item was updated in the ISG, the "RP-248a" and "RP-248b"</p>	<p>materials. Thus, the applicant should be prepared to address the following questions:</p> <p>a. Are the materials for the UTS bolt locking devices considered to be high-strength materials? If so, is the applicant downgrading the EPRI MRP inspection category for the UTS bolt locking devices to NAM and what is the basis for downgrading the UTS bolt locking devices to NAM category, even if they are made from high-strength stainless steel alloys? (Refer to the topic of Generic Audit Question #3).</p> <p>b. If downgrading is applicable and can be justified, why is the applicant using AMR subitems for the UTS bolt locking that reference SLR-ISG Item IV.B4.RP-246d and SLRA Item 3.1.1-051b for cracking of the locking devices and SLR-ISG Item IV.B4.RP-246e and SLRA Item 3.1.1-051b or 3.1.1-058b for LOM/wear and CID/VS or distortion in the locking devices, rather than GALL-SLR Item IV.B4.RP-236 and SLRA Item 3.1.1-055a (which should be used if the UTS bolt locking devices are now NAM category components)?</p> <p>3. The AMR subitems that reference GALL-SLR Items IV.B2.RP-248, -248a, and -248 on SLRA page 3-115 or 3-116 refer to GALL-SLR Items that cover management of cracking in the UCB bolts and bolt locking devices and CID and LOFT in the UCB bolt locking devices, respectively. But apparently, the applicant already covers management of UCB bolts and bolt locking devices in the AMR items and subitems for these components on SLRA pages 3-117 and 3-118. Thus, please explain the objective of the subitem referencing GALL-SLR Item IV.B4.RP-248b on SLRA page 3-115 and the subitems referencing GALL-SLR Items IV.B4.RP-248 and -248a on SLRA page 3-116.</p>	

Question/ Topic Number ⁴	SLRA Section	SLRA Page(s)	MRP-227, Rev. 1-A Table (T) Item References	Background / Issue (As applicable/needed)	Discussion Topic / Question / Request	
23	Table 3.1.2-2 B2.1.7	3-120, 3-121	T4-1, Item B13, Lower Grid Assembly: Alloy X-750 dowel-to- guide block welds (Primary components)	<p><u>AMR Commodity Grouping:</u></p> <p><i>Guide Blocks and Bolts</i></p> <p>1. For the referenced SLRA Table 3.1.2-2 AMR commodity grouping, the applicant includes AMR subitems referenced to GALL-SLR Items IV.B4.RP-261 and -260 (as updated in the ISG) to cover cracking and LOFT of the guide blocks; the applicant cross-references these subitems to SLRA Items 3.1.1-051b and 3.1.1-058b, which implies that the applicant is designating the guide blocks as "Expansion" category components. The commodity grouping for the guide blocks includes the blocks, guide block bolts, and guide block washers and dowels.</p> <p>2. The AMR for the guide block commodity grouping includes subitems referenced to GALL-SLR Item IV.B2.RP-246, as updated in the ISG.</p>	<p>a. The staff is perplexed by the "RP-260" and "RP-261" based subitem references in the AMR commodity grouping under NEI Note B, as the referenced GALL-SLR items (as updated in the SLR-ISG) apply only to the management of LOFT and cracking in lower grid assembly support pad items (which are evaluated as AMRs on SLRA pages 3-118 and 3-119). So why does the AMR commodity grouping include subitems that reference the "RP-260" and "RP-261" items?</p> <p>b. The staff is perplexed by the "RP-246" subitem references in the AMR commodity grouping under NEI Note A or B, as the referenced GALL-SLR item (as updated in the ISG) only applies to the management of cracking in LTS bolts. So why is the AMR commodity grouping include a subitem that references the "RP-246" item?</p> <p>c. For the corresponding MRP-227, Rev. 1-A basis, the lower grid guide blocks are designated as "Primary" category components, but this assumes a welded lower grid assembly guide block design. Is Duke informing the staff that the lower grid assembly guide block design at ONS Units 1, 2, and 3 utilizes a bolted guide block design and not a welded guide block configuration? Even if this is the case, why wouldn't the guide blocks (as bolted design configurations) in the ONS lower grid assembly remain as Primary components for the program, given the EPRI MRP's Primary designation for the guide blocks in Table 4-1 of MRP-227, Rev. 1-A. If "Expansion" is the case and can be technically justified, what is the technical basis for downgrading the guide blocks and their bolts (and any bolt locking devices or welds) to "Expansion" category and what are the corresponding Primary components and "Primary"-to-"Expansion" acceptance criteria for the applicable bolted configuration. In addition, why haven't the changes in inspection category, inspection interval, and inspection criteria (including those for "<i>expanding</i>" to the guide blocks) been defined as appropriate additions, modifications, or deletions to SLRA Tables B2.1.7-1, B2.1.7-2, and B2.1.7-3 (as appropriate), and why didn't Duke align the subitems to GALL-SLR Item IV.B2.R-423</p>	
#23 Cont.						

Question/ Topic Number ⁴	SLRA Section	SLRA Page(s)	MRP-227, Rev. 1-A Table (T) Item References	Background / Issue (As applicable/needed)	Discussion Topic / Question / Request	
#23 Cont.					(as updated in the ISG) and SLRA Item 3.1.1-118 for cracking mechanisms and to GALL-SLR Item IV.B4.R-424 (as updated in the ISG) and SLRA Item 3.1.1-119 to account for the ONS-specific design configuration (i.e., as applicable to a bolted guide block design)?	

Question/ Topic Number ⁴	SLRA Section	SLRA Page(s)	MRP-227, Rev. 1-A Table (T) Item References	Background / Issue (As applicable/needed)	Discussion Topic / Question / Request	
#27 Cont.				<p>support pads) to tie in CID/VS or distortion to the LTS bolts (i.e. to compensate for CID/VS being removed for the LTS bolts in the ISG).</p> <p>2. In the AMP gap analysis (SLRA Page B-67, See Question/Topic Item #3 Topic), the applicant states: <i>“General: removed visual VT-3 examination of high strength bolt locking devices.”</i> Thus, in the gap analysis, the applicant would appear to be removing the LTS bolt locking devices as “Expansion” category components if the locking devices were categorized as being fabricated from high-strength materials.</p>	<p>Item 3.1.1-058b for CID/VS or distortion and LOM/wear in the LCB bolt locking devices, rather than use of GALL-SLR Item IV.B4.RP-236 and SLRA Item 3.1.1-055a (which should be used if the LTS bolt locking devices are now NAM category components)?</p> <p>3. If the applicant is using the IV.B4.RP-260 referenced subitem (which applies to management of CID/VS or distortion in lower grid fuel assembly support pad items) to cover CID/VS or distortion in the LTS bolts, shouldn't the NEI Note reference be Note C or D?</p>	
28	Table 3.1.2-2 B2.1.7	3-128	T 4-1, Item B12, Flow Distributor (FD) Bolts and Bolt Locking Devices (Primary components)	<p><u>AMR Commodity Grouping:</u></p> <p><i>Shell Forging-to-Flow Distributor Bolts</i></p> <p>1. For the referenced SLRA Table 3.1.2-2 AMR commodity grouping, the item includes AMP B2.1.7-based subitems that are referenced to GALL-SLR Items IV.B4.RP-256, -256a,</p>	<p>Similar discussion topics to those previously given for the UCB/LCB bolts and bolt locking devices. Applicant should be prepared to address the following questions:</p> <p>a. Are the materials for the FD bolt locking devices considered to be high-strength materials? If so, is the applicant downgrading the EPRI MRP inspection category for the FD bolt locking devices to NAM and what is the basis for downgrading the FD bolt locking devices to NAM category, even if the FD locking devices are made from high-strength stainless steel alloys? (Refer to the topic of Generic Audit Question #3).</p>	

Question/ Topic Number ⁴	SLRA Section	SLRA Page(s)	MRP-227, Rev. 1-A Table (T) Item References	Background / Issue (As applicable/needed)	Discussion Topic / Question / Request	
#28 Cont.				<p>and -256b (as updated in the ISG). The referenced "RP-256" and "RP-256a" items cover cracking of the "Primary" category FD bolts and bolt locking devices, and the referenced "RP-256c" items cover LOM/wear and CID/VS or distortion in the LTS bolt locking devices, respectively.</p> <p>2. In the AMP gap analysis (SLRA Page B-67, See Question/Topic Item #3 Topic), the applicant states: <i>"General: removed visual VT-3 examination of high strength bolt locking devices."</i> Thus, in the gap analysis, the applicant would appear to be removing the LTS bolt locking devices as "Expansion" category components if the locking devices were categorized as being fabricated from high-strength materials.</p>	<p>b. If downgrading to NAM is applicable and can be justified, why is the applicant using AMR subitems for the FD bolt locking devices that reference to GALL-SLR Items IV.B4.RP-256a and SLRA Item 3.1.1-051a for cracking of the FD bolt locking devices and GALL-SLR IV.B4.RP-256b and SLRA Item 3.1.1-058a for CID/VS or distortion and LOM/wear in the FD bolt locking devices, rather than use of GALL-SLR Item IV.B4.RP-236 and SLRA Item 3.1.1-055a (which should be used if the LTS bolt locking devices are now NAM category components)?</p>	
29		3-131	<p>T4-1, Item B4, VV OLDs (pressure plate, spring, spring retainer, and U-cover; Primary components)</p> <p>T4-1, Item B5, VV OLDs: key ring and pin; Primary components)</p>	<p><u>AMR Commodity Grouping:</u></p> <p><i>Vent Valve Assembly Locking Devices</i></p>	<p>Applicant includes some plant-specific NEI Note F items for the original locking devices (OLDs) or modified locking devices (MLDs) if made from nickel alloy. No real questions, but for the Note F designated subitems, applicant to confirm whether the EPRI MRP-referenced and specified OLD and MLD components at ONS remain as designated "Primary" category components for the program regardless of whether the components are made from stainless steel or nickel alloy materials.</p>	

Question/ Topic Number ⁴	SLRA Section	SLRA Page(s)	MRP-227, Rev. 1-A Table (T) Item References	Background / Issue (As applicable/needed)	Discussion Topic / Question / Request	
31 (Originally #5 from TRP 2, Water Chemistry)	Section 3.1	3-110 to 3-133 Table 3.1.2-2		The staff notes that SLRA Table 1 Item 3.1.1-087 (GALL-SLR Item IV.B4.RP-24) is associated in Table 3.1.2-2 with specific reactor internals components. However, this GALL item is intended to address loss of material due to pitting or crevice corrosion for all stainless steel and nickel alloy reactor internals using the Water Chemistry program. These aging mechanisms are not addressed by MRP-227 and XI.M16A. In addition, associating Item 3.1.1-087 with specific reactor internals components in Table 3.1.2-2 means it does not address pitting or crevice corrosion for the other reactor internals components.	Please clarify how aging management addresses loss of material due to pitting or crevice corrosion for all stainless steel and nickel alloy reactor internals using the Water Chemistry program, considering Item 3.1.1-087 is associated only with specified primary or expansion category internal components in SLRA Table 3.1.2-2. This approach does not cover the “no additional measures” components in MRP-227.	

- For ONS unit entries in Table 4-1 of MRP-227, Rev. 1-A, the EPRI MRP lists the following types of RVI bolt locking devices as “Primary” category components: (a) specified OLDs or MLDs per items B4, B5, and B6, and (b) locking devices for UCB, LCB, and FD bolts per Items B7, B8, and B12, (c) locking devices for the baffle-to-former bolts and internal baffle-to-baffle bolts per Item B11, and (d) locking devices for the LFD shock pad bolts per Item B14.
- Similarly for ONS unit entries in Table 4-4 of MRP-227, Rev. 1-A, the EPRI MRP lists the following types of RVI bolt locking devices as “Expansion” category components: (a) locking devices for UTS and LTS bolts per items B7.1 and B8.1, (b) locking devices for lower grid fuel assembly support pad item cap screws per item B15.1, and (c) locking devices for external baffle-to-baffle bolts and core barrel-to-former bolts per Item B11.1.
- The staff acknowledges that under the existing MRP-227, Rev. 1-A basis, the CB cylinder girth and axial welds and former plates are inaccessible for inspection, and that if the results of Primary inspections of the baffle plates trigger Expansion to the CB cylinder seam welds and former plates (per Item B10 in Table 5-1 of MRP-227, Rev. 1-A), integrity of the CB cylinder and former plates is to be performed by component-specific analysis or schedular repair/replacement activities. The staff addressed this component-specific analysis need or schedular repair/replacement activity needs for the CB cylinder (Including the CB cylinder seam welds) and the former plates as part of Condition Item #1 for Group 1 B&W design RVI components, which was issued in the staff’s April 25, 2019 safety evaluation for MRP-227, Rev. 1-A.

4. **NEEDED AND IMPORTANT CLARIFICATION ON USE OF MRP-189, REVISION 3 (ADAMS ACCESSION NO. MLXXXXXXXXXX) FOR PWR RVI COMPONENT-SPECIFIC GAP ANALYSIS SCREENING RESULTS:** In NEI Comment No. 1 (ADAMS Accession No. ML20246G654) on SLR-ISG-2021-01-PWRVI (ADAMS Accession No. ML20217L203), NEI recommended that the staff revise the draft version of the ISG to reference MRP-191, Revision 2 or MRP-189, Revision 3 as one acceptable way to screen RVI aging effects and aging mechanisms. The following three italicized paragraphs provide the staff's response to NEI Comment #1 and the staff's position on use of MRP-189, Rev. 3 for incoming SLRAs of B&W-designed PWR units.

As stated in Appendix H of the final ISG, the "staff did not formally accept NEI Comment #1 or NEI's recommended revision of the staff's AMR Further Evaluation guidance in SRP-SLR Sections 3.1.2.2.9 and 3.1.3.2.9 (i.e., to include guidance criteria that would permit use of the proprietary EPRI MRP-191, Rev. 2 or MRP-189, Rev. 3 reports for component-specific screening objectives). Specifically, these reports have not been formally reviewed for acceptance by the NRC staff and were not used as the component-specific screening report criteria for the staff-accepted inspection and evaluation (I&E) guidelines in MRP-227, Rev. 1-A. Instead, these reports form the screening and ranking bases for what will be EPRI's updated I&E guidelines for a planned MRP-227, Rev. 2 report, which has yet to be submitted for staff review. Accordingly, the staff does not find it appropriate to reference MRP-191, Rev. 2 or MRP-189, Rev. 3 in the staff's updates of SRP-SLR Sections 3.1.2.2.9 or 3.1.3.2.9, as provided in Appendix C of this ISG.

However, because the staff's update of AMP XI.M16A, "PWR Vessel Internals," in the ISG permits the use of additional reports or methodologies to supplement MRP-227, Rev. 1-A, an SLR applicant would not be precluded from using MRP-191, Rev. 2 or MRP-189, Rev. 3 for component-specific screening objectives if the applicant determines that the use of those reports is appropriate for its RVI management program.

Accordingly, for SLR applicants that decide to use these reports, the staff would expect that use of the report would be discussed, evaluated, and supported in the applicant's technical basis document for its RVI management program."

Thus, based on the response to NEI Comment #1, simple referencing of the MRP-189, Rev. 3 report for a specified gap analysis change would not be technically sufficient without further technical or regulatory clarifications on the basis and justification for the change; however, this does not necessarily correlate to an SLRA SER conclusion by the staff that a gap analysis change based on information in MRP-189, Rev. 3 would not be acceptable for implementation under the PWR Vessel Internals AMP. Such SER decisions would be based on the merits of technical and regulatory information for the given gap analysis change and reviewed by the staff on a case-by-case basis; such matters may be subject to the staff's RAI process when applicable, appropriate and necessary.