



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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October 11, 2022

Mr. Brad Adams,
Chairman, PMMP EC
Southern Nuclear Operating Co., Inc.
Mr. Robert O. McGill,
MRP Program Manager
Electric Power Research Institute
Palo Alto Office
3420 Hillview Avenue
Palo Alto, CA 94304-1338

SUBJECT: REGULATORY AUDIT PLAN FOR ELECTRIC POWER RESEARCH
INSTITUTE TECHNICAL REPORT MATERIALS RELIABILITY PROGRAM-227,
REVISION 2, "MATERIALS RELIABILITY PROGRAM: PRESSURIZED WATER
REACTOR INTERNALS INSPECTION AND EVALUATION GUIDELINES"
(EPID L-2022-TOP-0029)

Dear Mr. Adams and Mr. McGill:

By letter dated May 9, 2022, the Electric Power Research Institute (EPRI) submitted technical report "Materials Reliability Program [(MRP)]: Pressurized Water Reactor Internals Inspection and Evaluation Guidelines" (MRP-227, Revision 2) to the U.S. Nuclear Regulatory Commission (NRC) staff for review and approval (Agencywide Documents Access and Management System (ADAMS) Package Accession No. ML21301A194). The NRC staff reviewed and accepted the technical report on June 17, 2022 (ADAMS Accession No. ML22145A401).

The NRC staff's technical review of this technical report is ongoing and the staff has determined that a regulatory audit is needed to facilitate the review. The NRC staff will perform a combination of in person and virtual regulatory audit the week of October 31, 2022. Enclosure 1 is a copy of the audit plan the NRC staff will follow. Enclosures 2 through 5 are the general and nuclear steam system supplier design-specific topics to be discussed.

Please contact Lois M. James via e-mail at Lois.James@nrc.gov with any questions you may have regarding this letter or the audit plan.

Sincerely,

/RA Ngola Otto for/

Richard Chang, Chief
Licensing Projects Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 99902021

Enclosure:
As stated



REGULATORY AUDIT PLAN
FOR ELECTRIC POWER RESEARCH INSTITUTE TECHNICAL REPORT
MATERIALS RELIABILITY PROGRAM-227, REVISION 2,
“MATERIALS RELIABILITY PROGRAM: PRESSURIZED WATER REACTOR INTERNALS
INSPECTION AND EVALUATION GUIDELINES”
(EPID L-2022-TOP-0029)

1.0 BACKGROUND

By letter dated May 9, 2022, the Electric Power Research Institute (EPRI) submitted technical report “Materials Reliability Program [(MRP)]: Pressurized Water Reactor [(PWR)] Internals Inspection and Evaluation Guidelines” (MRP-227, Revision 2) to the U.S. Nuclear Regulatory Commission (NRC) staff for review and approval (Agencywide Documents Access and Management System (ADAMS) Package Accession No. ML21301A194). The NRC staff reviewed and accepted the technical report on June 17, 2022 (ADAMS Accession No. ML22145A401)

2.0 REGULATORY AUDIT BASES

Part 54 of Title 10 of the *Code of Federal Regulations* (10 CFR) addresses the requirements for plant license renewal. The regulation at 10 CFR 54.21, “Contents of application--technical information,” requires that each application for license renewal contain an integrated plant assessment (IPA) and an evaluation of time limited aging analyses. The IPA shall identify and list those structures and components subject to an aging management review and demonstrate that the effects of aging (i.e., cracking, loss of material, loss of fracture toughness, dimensional changes, loss of preload) will be adequately managed so that their intended functions will be maintained consistent with the current licensing basis for the period of extended operation as required by 10 CFR 54.29, “Standards of issuance of a renewed license.”

MRP-227 contains a discussion of the technical basis for the development of plant-specific aging management programs (AMPs) for reactor vessel internal (RVI) components in PWR vessels and provides inspection and evaluation guidelines for PWR applicants to use in their plant-specific AMPs. MRP-227 provides the basis for renewed license holders to develop plant-specific inspection plans to manage aging effects on RVI components, as described by their final safety analysis report commitment.

3.0 REGULATORY AUDIT SCOPE

The NRC staff is performing its review of Technical Report MRP-227, Revision 2, in accordance with the Office of Nuclear Reactor Regulation's Office Instruction (OI) LIC-500, Revision 9, "Topical Report Process" (ADAMS Accession No. ML20247G279). The OI LIC-500, Revision 9, guidance provides the NRC staff with the opportunity to conduct regulatory audits to help: (1) efficiently gain an understanding of the submittal and a better understanding of detailed calculations, analyses, and bases; (2) verify information; and (3) identify information that will require docketing to support a staff decision. Regulatory audits are addressed in OI LIC-111, "Regulatory Audits" (ADAMS Accession No. ML19226A274). Following the regulatory audit, the NRC staff will issue request for additional information questions in accordance with OI LIC-115, "Processing Requests for Additional Information" (ADAMS Accession No. ML21141A238).

The NRC staff will conduct a combination of in person and virtual regulatory audit during the week of October 31, 2022. This audit is expected to include discussions between the NRC staff and EPRI staff regarding areas of the technical report that staff has identified in this audit plan. The proposed audit is broken into the following technical audit areas:

- General Regulatory or Technical Audit Topics for MRP-227, Revision 2 (See Enclosure 2 for a list of general audit discussion topics)
- Babcock & Wilcox Company (B&W), now owned by Framatome, Inc., Design-Specific Audit Topics for Tables 3-1, 4-1, 4-4, and 5-1 of MRP-227, Revision 2 (See Enclosure 3 for a list of tabular audit discussion topics)
- Combustion Engineering, Inc. (CE) Design-Specific Audit Topics for Tables 3-2, 4-2, 4-5, 4-8, and 5-2 of MRP-227, Revision 2 (See Enclosure 4 for a list of tabular audit discussion topics)
- Westinghouse Electric Company (WEC) Design-Specific Audit Topics for Tables 3-3, 4-3, 4-6, 4-9, and 5-3 of MRP-227, Revision 2 (See Enclosure 5 for a list of tabular audit discussion topics)

- Additional miscellaneous audit topics that may arise during the audit session or may carry over from the audit session on a scheduled audit day and may require additional audit scheduling between the EPRI MRP and the NRC staff

The component-specific line items in the tabular audit discussion tables of Enclosures 3, 4, and 5 are color coded as follows in order to convey whether the component-specific topics warrant audit discussions, and if so, the degree of audit discussions that are merited on the component-specific audit topic: (1) blue color highlighted content conveys the component-specific topic does not need to be included in audit discussions, (2) yellow color highlighted content conveys the component-specific topic warrants some limited audit discussion, and (3) green color highlighted content conveys the component-specific topic warrants more detailed audit discussions.

4.0 INFORMATION NEEDS

The NRC staff requests that EPRI make available the appropriate engineer(s) with knowledge of EPRI MRP I&E guidelines and any appropriate references, to address questions by the NRC staff.

Documents referenced in the technical report should also be made available via an online reference portal.

5.0 TEAM ASSIGNMENTS

James Medoff, Technical Reviewer (NRR/DNRL/NVIB)

Carol Moyer, Technical Reviewer (NRR/DNRL/NVIB)

John Tsao, Technical Reviewer (NRR/DNLR/NVIB)

Lois M. James, Senior Project Manager (NRR/DORL/LLPB)

Angie Buford, Branch Management (NRR/DNRL/NVIB; optional attendance during the audit)

6.0 LOGISTICS

Audit Date: Week of October 31, 2022

The NRC staff will work with EPRI to establish times for breakout sessions based on the availability of the NRC and EPRI staff.

The audit will be conducting using both in person and virtual breakout sessions. The in person sessions will conducted at office local to Rockville, Maryland. The virtual breakout sessions will be conducted via the Microsoft Teams online platform and the log-in information will be provided to the EPRI staff by the NRC staff.

The NRC staff requests a portal be made available to the staff containing reference material mentioned in the technical report. The use of the online reference portal will be in accordance with the following restrictions:

- The online reference portal will be password-protected, and passwords will be distributed only to the NRC staff directly involved in the MRP-227, Revision 2, review on a need-to-know basis.
- The online reference portal will not support any printing, saving, or downloading functions.

- The NRC staff who are granted access to the online reference portal will be informed of the conditions related to the use of the online reference portal by the NRC project managers.
- The conditions associated with the online reference portal will be maintained throughout its use during the MRP-227, Revision 2, review process.
- Documents posted to the online reference portal will be limited to reference material cited in the technical report, in support of the staff's audit of the information in the technical report, and other documents as agreed upon by the EPRI and NRC staff, and
- The NRC staff requests that EPRI make the portal accessible to the staff as soon as possible. At some time near the end of the technical report review, the NRC management and EPRI will agree to a date to close the portal.

7.0 DELIVERABLES

A regulatory audit summary will be provided within 90 days of the completion of the audit.

GENERAL REGULATORY OR TECHNICAL AUDIT TOPICS

FOR ELECTRIC POWER RESEARCH INSTITUTE

TECHNICAL REPORT MATERIALS RELIABILITY PROGRAM (MRP)-227, REVISION 2,

“MATERIALS RELIABILITY PROGRAM: PRESSURIZED WATER REACTOR INTERNALS

INSPECTION AND EVALUATION GUIDELINES”

(EPID L-2022-TOP-0029)

- I. Changes made in MRP-227, Revision 2, that may reopen the U.S. Nuclear Regulatory Commission (NRC) staff’s conclusions in the April 25, 2019, safety evaluation (SE) for MRP-227, Revision 1-A

Revision 2 of MRP-227, addresses programmatic aging management program (AMP) changes for Westinghouse Electric Company (WEC), Combustion Engineering, Inc (CE), and Babcock & Wilcox Company (B&W), now owned by Framatome, Inc. (Framatome), designed pressurized water reactor (PWR) reactor vessel internal (RVI) components during 60 – 80-year subsequent license renewal (SLR) periods. Some of the changes made in MRP-227, Revision 2, however, do not appear to be limited to or do not involve SLR periods. Some revisions made in MRP-227, Revision 2, involve amendments of screening, inspection categorization, inspection and evaluation (I&E), or acceptance criteria bases for component-specific locations during 40 – 60-year initial license renewal (ILR) periods. In this case, the amended guideline criteria are different from the corresponding component-specific guidelines for ILR periods in MRP-227, Revision 1, that were subsequently approved by the NRC staff in the April 25, 2019, SE (Agencywide Documents Access and Management System (ADAMS) Accession No ML19081A001) for Revision 1, and incorporated into the MRP-227, Revision 1-A upon receipt of our SE. Such changes may reopen our conclusions made the April 25, 2019, SE.

Specific examples of such changes are provided below. The list contains examples of changes that do not appear to be associated with the SLR period and is not intended to be a complete list.

- EPRI MRP includes its aging mechanism screening results and final inspection category rankings for designated B&W, CE, and WEC designed components in Tables 3-1, 3-2, and 3-3 of the MRP-227 versions (including -A, Revision 1-A, and Revision 2 versions). The operating period durations of aging effects assessed in the past MRP-227-A and MRP-227, Revision 1-A, reports only cover 40 – 60 year ILR periods. The NRC staff has observed that some of the component-specific screening line items in Tables 3-1, 3-2, and 3-3 of MRP-227, Revision 2, are brand new and thus are given for components that were never listed or subject to screening assessments (with listed screening ranking and final inspection category results) in the prior -A and Revision 1-A versions of MRP-227.

- This creates a logistics problem for the NRC staff because: (1) the screening bases for the new component type in either Table 3-1, 3-2, or 3-3 of the Revision 2 version are for a cumulative 80-year service life periodicity and (2) the NRC staff was never given any 40 – 60 year screening and final inspection category results for these component types in MRP-227, Revision 1 (or afforded the opportunity to review 40 – 60 year screening and final inspection categorization results for the specified component type when the staff was performing its review of MRP-227, Revision 1).

Thus, the NRC staff is unable to determine whether screening and final inspection category results for these newly screened components have changed when going from a 40 – 60 year periodicity assessment to a 40 – 80 year periodicity assessment, as 40 – 60 year results for the components were never included in the Revision 1 version. Thus, for the newly screened component types, this creates a logistics issue and will reopen the April 25, 2019, SE for MRP-227, Revision 1-A, because 40 – 60 year screening and final inspection category results for the newly specified component types in Revision 2 were never included in MRP 227, Revision 1.

- In the inspection-based line item for Primary category B&W design RVI components in Table 4-1 of MRP-227, Revision 2, or for Expansion category B&W design RVI components in Table 4-4 of MRP-227, Revision 2, Framatome designates the specified component-specific line item as being applicable to either “40 – 60” year, “40 – 80” year, or “60 – 80” year design periodicity terms. In many cases, the Table 4-1 or 4-4 line items applying to “40 – 60” year or “40 – 80” year periodicity terms in Revision 2 are changing the past 40 – 60 year I&E basis for the specific component type that was previously given in MRP-227, Revision 1-A, as approved in the NRC staff’s past April 25, 2019, SE for MRP-227, Revision 1-A. Thus, these types of changes will reopen items described in the April 25, 2019, SE for MRP-227, Revision 1-A, because the revised “40 – 60” year or “40 – 80” year component-specific line items in either Table 4-1 or 4-4 of Revision 2 are changing the past 40 – 60 year I&E bases for the component-specific types from the way they were left in MRP-227, Revision 1-A, as evaluated, and approved or dispositioned in the April 25, 2019, SE for that version of MRP-227 methodology.

II. Underlying MRP-227 Assumption or General Methods Check – Are They Still Valid for 80 Years

A general discussion of the following assumptions or generic methods is needed for the NRC staff’s understanding and will be topics of the audit:

- Use of original post-weld heat treatment assumptions for screening out cracking that may be induced by stress corrosion cracking or irradiation-assisted stress corrosion cracking mechanism.
- For Primary, Expansion, or Existing program components subject to inspection criteria, confirmation that the underlying assumption that the inspection method applied for one or more specific aging mechanisms in the referenced Chapter 4 tabular line items is appropriate to cover all assessed Chapter 3 screening mechanisms for the component type.

- The additional twenty-year impacts in the 80-year MRP-227, Revision 2, methodology on PWR plants using flexible operations. Specifically, how would duration of flexible operations impact MRP-227, Revision 2, I&E criteria. Would different I&E criteria need to be proposed for given component types, especially if implemented prolonged flexible operations?
- The assumption for use low leakage fuel after 30 years of plants operations still applies to the 80-year assessment in MRP-227, Revision 2.
- For components assigned to “No Additional Measures” category in MRP-227, Revision 2, the methodology does not cancel out American Society of Mechanical Engineers (ASME) Section XI Inservice Inspection requirements if the component type is categorized as an ASME Section XI, Examination Category B-N-2 or B-N-3 component.

III. Past Staff-Issued Applicant/Licensee Actions Items on MRP-227-A or MRP-227, Revision 1-A Methodology – Potential 80-Year Consideration Impacts

- The past Applicant/Licensee Actions Items (A/LAIs) for the past MRP-227-A and Revision 1-A reviews were issued based on 60-year assessment period considerations. The A/LAIs for MRP-227-A were all closed out by subsequent NRC SEs after the December 16, 2011, SE for MRP-227-A. A/LAI No. 1 on MRP-227, Revision 1-A (aging in WEC-design baffle-to-former bolts), remains open for WEC-design license renewal applications or SLR applications.
- For CE and WEC designed units that were subject to A/LAI No. 1 on MRP-227-A, whether the average power, linear heat generation number, and top of core-to-bottom of core plate distance checks (as defined in MRP 2013-025, “MRP-227-A Applicability Template Guideline” (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13322A454)) still need to be done for SLR periods. For the past PWR SLR applications of CE or WEC units, the RVIs program specialists for the units are confirming that they are continuing to perform these checks as part of the PWR Vessel Internal Programs. Framatome should be prepared to discuss whether similar checks are needed for B&W design units.
- For the remaining A/LAIs issued on MRP-227-A, do our SE bases for closing those A/LAIs in past SE (e.g., SEs of either April 25, 2019, or January 19, 2018 (ADAMS Accession No. ML18016A008) remain valid for 80-year considerations or do the A/LAIs need to be reopened for 80-year considerations? NOTE: Some of these past A/LAIs cover the general assumptions delineated in Section II above.

IV. Changes to Specified Text in MRP-227, Revision 2, Chapter 4, “PWR Internals Aging Managements”

- Section 4.2.3 discusses non-qualified visual inspections. As an example, Section 4.2.3 uses the non-qualified visual inspection to examine the core shroud tie rod. Section 4.2.3 does not establish or define any minimum inspection requirements that would need to be met or include any discussion of the minimum requirements for the plant examiner to perform non-qualified visual inspections (e.g., does the examiner need to have certain years of experience and training in what to look for at a specific reactor pressure vessel (RPV) internal component)? Thus, use of non-qualified visual inspection methods needs to be discussed with the NRC staff.

V. Changes to Specified Text in MRP-227, Revision 2, Chapter 5, “Examination Acceptance Criteria and Expansion Criteria”

- Section 5.1.1 states that “...ASME Code Section XI, Examination Category B-N-3 [2], provides a set of relevant conditions for the visual (VT-3) examination of removable core support structures in IWB-3520.2, as follows:
 - Structural distortion or displacement of parts to the extent that component function may be impaired
 - Loose, missing, cracked, or fractured parts, bolting, or fasteners
 - Corrosion or erosion that reduces the nominal section thickness by more than 5%
 - Wear of mating surfaces that may lead to loss of function
 - Structural degradation of interior attachments such that the original cross-sectional area is reduced more than 5%...”

However, in the 2019 Edition of the ASME Code, Section XI, IWB-3520.2 contains an item “foreign materials or accumulation of corrosion products that could interfere with control rod motion or could result in blockage of coolant flow through fuel.” This item is not listed in the above bullets in Section 5.1.1. The NRC staff’s perspective is that Section 5.1.1 of MRP-227, Revision 2, needs to address this new ASME VT-3 inspection requirement. EPRI MRP should be prepared to discuss this matter with the NRC staff.

- Section 5.1.4, “Non-Qualified Visual Inspection,” discusses application of non-qualified visual inspection methods for aging management objectives. The basis in Section 5.1.4 needs to be discussed in general, as the EPRI MPR has never proposed use of non-qualified techniques in the past -A or Revision 1-A versions of MRP-227.

The EPRI MRP should be prepared to discuss why non-qualified inspection methods may be appropriate and acceptable for given PWR RVI component types, what type of visual inspection techniques will be applied as the non-qualified techniques, and whether requirements for non-qualified visual inspection techniques have been appropriately defined and discussed in MRP-228, Revision 4 (including establishments of defined minimum inspection acceptance criteria for the non-qualified techniques that must be met by visual nondestructive examination personnel performing the non-qualified examinations) (EPRI Proprietary Report No. 3002018245, "Materials Reliability Program: Inspection Standard for Pressurized Water Reactor Internals – 2020 Update (MRP-228, Rev. 4)," December 2020; ADAMS Package Accession No. ML21019A000).

- Section 5.1.6 states that "...Requirements for developing technical justifications of volumetric examinations, such as ultrasonic testing (UT), of bolts are provided in the inspection standard, MRP-228..." The NRC staff has not approved MRP-228, Revision 4. The staff addressed MRP-228 bases for non-qualified visual techniques previously. However, EPRI MRP should be prepared to confirm that MRP-228, Revision 4, includes appropriate criteria for UT, eddy current testing, and EVT-1, VT-1, and VT-3 visual inspection techniques, including establishment of minimum inspection requirements for those techniques.
- Section 5.2 discusses physical measurements. The need for performance of physical only applied to a very few number of RVI components for confirmation the initial component-specific design dimensions were with a small allowable design range; the physical measurement need was normally dictated by EPRI MRP as a one-time baseline measurement to be formed either just prior to the ILR period or within a short time of entering into the ILR period, with subsequent aging management to be performed using periodic VT-3 inspections of the components that were subject to the baseline physical measurement activities (normally on a 10-year frequency). But this was for 40 – 60 year ILR periods and EPRI MRP needs to establish whether a second round of physical measurements should be performed to those component types because we are dealing with a proposed 60 – 80 year SLR period. Additionally, EPRI MRP should be prepared to discuss whether MRP-228, Revision 4, has been updated to define and include the latest criteria for performance of physical measurement techniques (including minimum acceptance criteria and qualification requirements for the techniques).

VI. Changes to Specified Text in MRP-227, Revision 2, Chapter 6, "Evaluation Methodologies"

- Section 6, second paragraph, states that "...In the report MRP-210, EPRI developed an assessment of the fracture toughness of irradiated stainless steel for boiling water reactor (BWR) core shrouds ..." Section 6 of MRP-227, Revision 2, states that "...There is also some information related to fracture toughness data and models in various technical reports and industry literature..." which referenced EPRI report MRP-211, Rev. 1..." (EPRI Proprietary Report No. 3002010270, "Materials Reliability Program: PWR Internals Age-Related Material Properties, Degradation Mechanisms, Models, and Basis Data-State of Knowledge (MRP-211, Revision 1)," December 2017; ADAMS Package No. ML17361A168) and EPRI Report MRP-210 (EPRI Proprietary Report No. 1016106, "Materials Reliability Program: Fracture Toughness Evaluation of Highly Irradiated PWR Stainless Steel Internal Components (RMP-210),"

December 2007; ADAMS Accession No. ML15223A944). However, the corresponding section in Section 6 of MRP-227, Revision 1-A, also referenced MRP-100-A (EPRI Proprietary Report No. 1013396, "BWRVIP-100-A, BWR Vessel and Internals Project, Updated Assessment of the Fracture Toughness of Irradiated Stainless Steel for BWR Core Shrouds," August 2006; ADAMS Package No. ML062570227) as the fracture toughness assessment. MRP-210 indicates the fracture toughness evaluation for highly irradiated materials in the report were based on the prior fracture toughness data in MRP-211. However, the fracture toughness data assessed in MRP-211 for many fluence ranges were based on those provide in BWRVIP-100-A (which has now been updated to EPRI Proprietary Report No. 3002008388, "BWRVIP-100, Revision 1-A, BWR Vessel and Internals Project, Updated Assessment of the Fracture Toughness of Irradiated Stainless Steel for BWR Core Shrouds," August 2006; ADAMS Package No. 17076A213) and EPRI has established a 10 CFR Part 21 on the BWRVIP-100, Revision 1-A, fracture toughness data. The MRP-211 and BWRVIP-100 related matters are a pending Open Item for the NRC staff's current and pending review of WEC Non-Proprietary Class 3 Report No. WCAP-17096, Revision 3, "Reactor Internals Acceptance Criteria Methodology and Data Requirements" (July 2019, ADAMS Accession No. ML19218A179), which is based on the current criteria in MRP-227, Revision 1-A (but not the updated bases in MRP-227, Revision 2). So, the potential inter-relationships of these reports (and the industry's resolution of the open item on the fracture toughness data) need to be generically discussed with the NRC staff and appropriately tied down in the report (this includes ensuring that latest versions of the referenced background reports are being referenced in MRP-227, Rev. 2).

- In Section 6, EPRI also indicated that irradiation-assisted stress corrosion cracking crack growth rate (CGR) models for stainless materials in both PWR and BWR internals were developed and are given in EPRI Report No. 3002003103, "Models of Irradiation-Assisted Stress Corrosion Cracking of Austenitic Stainless Steels in Light Water Reactor Environments, Volume 2: Disposition Curves Applications" (Year 2014, as given in Reference 38 of MRP-227, Revision 2), and that these CGR models which have been incorporated into ASME Code Case N-889, "Reference Stress Corrosion Crack Growth Rate Curves for Irradiated Austenitic Stainless Steel in Light Water Reactor Environments" (July 12, 2018; included in Supplement 7 of the 2017 Edition of the ASME Boiler and Pressure Vessel Code, Section XI; included as Reference 39 in MRP-227, Revision 2) and can be used in PWR internals evaluations..." The referenced EPRI report has not been submitted for NRC staff review in ADAMS and thus is an unapproved methodology. Additionally, the NRC staff has established conditions on use of the referenced code case in the latest staff version of Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1" (ADAMS Accession No. ML21181A222), that references use of the code case. Additionally, use of referenced EPRI CGR report and code case is a pending draft Condition Item for the staff's pending review of PWR Owners Group (PWROG) Non-Proprietary Report No. WCAP-17096, Revision 3 (NOTE: the same EPRI CGR report was listed as Reference 46 in WCAP-17096, Revision 3). Thus, use of the applicable EPRI CGR report and code case needs to be discussed generically as part of the audit for the NRC staff to assess whether a similar condition needs to be established for the MRP-227, Revision 2, methodology.
- Section 6 of MRP-227, Revision 2, references the use of MRP-379 (ADAMS Accession No. ML17289A508) for welding repairs of PWR irradiated material.

However, the NRC staff has not approved MRP-379. Thus, EPRI MRP should be prepared to discuss the application of MRP-379 as a weld repair methodology for PWR RVI components and why use of MRP-379 is acceptable for implementation by a licensee implementing MRP-227, Revision 2.

- Section 6 of MRP-227, Revision 2, references the use of the PWROG RVI acceptance criteria and data analysis criteria methodology in WCAP-17096-NP-A (or the latest approved version of the report; See Reference 33 in MRP-227, Revision 2). However, WCAP-17096-NP-A, Revision 2, does not apply to MRP-227, Revision 2, or even to the prior version of the report in MRP-227, Revision 1-A, because the status for component-specific ID item assessments in Appendices A, C, or E of WCAP-17096-NP-A, Revision 2, only applies to the status of component-specific “*evaluation and acceptance criteria*”-type line items in Tables 5-1, 5-2, and 5-3 of the MPP-227-A report (which is a 60-year report). In fact, it is the updated status of component-specific ID item assessments in Appendices A, C, or E of WCAP-17096, Revision 3, that apply to the status of component-specific “*evaluation and acceptance criteria*”-type line items in Tables 5-1, 5-2, and 5-3 of the MPP-227, Revision 1-A, report (which is a 60-year report); and WCAP-17096, Revision 3, is currently a pending report review for the NRC. Specifically, the PWROG has yet to develop a version of WCAP-17096 that would now cover the status of the updated “*evaluation and acceptance criteria*”-type line items in Tables 5-1, 5-2, and 5-3 of the MPP-227, Revision 2, report. This issue will also show up in Chapter 7 of MRP-227, Revision 2, because Chapter 7 (Section 7.5) also refers to WCAP-17096-NP-A, Revision 2, as the applicable WCAP methodology for the PWROG acceptance criteria and data analysis criteria for the components. This issue needs to be discussed and resolved.

VII. Changes to Specified Text in MRP-227, Revision 2, Chapter 7, “Implementation Criteria”

- Section 7.1 states that

“...The following sections list or summarize the requirements contained in this document. MRP-227, Revision 2, incorporates all Needed and Mandatory guidance from MRP 2014-006 [45], MRP 2017-009 [78] (including NSAL-16-1 [47]), MRP 2018-002 [48] (including NSAL-16-1 [47]), MRP 2018-007 [79] (including NSAL-17-1 [43]), MRP 2018-022 [84], MRP 2018-027 [54] (including NSAL-18-1 [52]), MRP 2019-002 [71], TB-07-2 [75], TB-12-5 [46], TB-14-5 [56], TB-16-4 [59], TB-19-5 [50], OG-19-101 [77] (including NSAL-18-1 [52]), and OG-20-113 [55] (including NSAL-20-1 [51]); these guidance documents are referenced for use in these guidelines as appropriate...”

Since these reports are supplemental guidance that may or may not apply to the PWR design of a licensee’s PWR unit or units, EPRI MRP should be prepared to discuss what regulatory process prompts the licensee to implement a given referenced report as a supplemental methodology for the PWR Vessel Internals Program under the design basis or currently licensing basis (CLB) for the facility (i.e., if the given report was applicable to the design basis or CLB). EPRI MRP should also be prepared to discuss what is the safety or regulatory consequence of not implementing one of the given supplemental reports for its site-specific PWR Vessel Internals Program if the report is applicable to the plant design or CLB.

The EPRI MRP should also discuss why EPRI MRP Report MRP 2013-025 is not being listed within the scope of the collective set of reference reports in Section 7.1 because licensees owning CE or WEC designed units are implementing the MRP 2013-025 average power, linear heat generation number, and top of core-to-bottom of core plate distance checks for their units during SLR periods. Additionally, the NRC staff does not see MRP 2019-009 or MRP 2019-023 with the scope of the collective supplemental reference documents; this should be discussed as well.

- Section 7.3 states that

“...In accordance with Appendix C of NEI 03-08[1], it was determined that NRC approval of MRP-227, Revision 2 via safety evaluation is needed prior to generic release for implementation. Therefore, implementation of Tables 4-1 through 4-9 and Tables 5-1 through 5-3 in MRP-227, Revision 2 is not required at this time. MRP-227 will be revised upon approval by the NRC (Revision 2-A), and an implementation timeline will be included at that time. If a site chooses to follow Tables 4-1 through 4-9 and Tables 5-1 through 5-3 in MRP-227, Revision 2, the site is responsible for reviewing its site-specific design bases, license renewal commitments and inservice relief requests per NEI-03-08 to ensure that there are no limitations that would preclude implementation...”

The NRC staff may not find this type of implementation basis to be acceptance for licensees that will be implement PWR Vessel Internals Programs during a renewed SLR period. Specifically, some PWR units were approved for SLR using PWR Vessel Internals Programs that were based on MRP-227, Revision 1-A, as supplemented by the results of a site-specific 80-year RVI gap analysis (as defined in NRC Interim Staff Guidance No. SLR-ISG-2021-01-PWRVI). The subsequent renewed operating license basis for these types of PWR Vessel Internals Programs have no relationship to the guidance that presumably will be issued in a future MRP-227, Revision 2-A, version (presuming MRP-227, Revision 2, is accepted by the NRC staff). The NRC staff is not clear exactly how the information in an upcoming future version of MRP-227, Revision 2-A, will be revised to show the implementation timeline. The lack of details for the implementation timeline basis in Section 7.5 of MRP-227, Revision 2, need to be discussed as part of the audit since there are some SLR application (SLRA) timing considerations that have a factor in how the implementation timeline for MRP-227, Revision 2, will need to be established and because the EPRI MRP is relying on a future promissory note (to develop the implementation timeline is a future revision of MRP-227, Revision 2-A) that may or may not be done by EPRI MRP down the road.

- The prior version of “MRP-227” in Revision 1-A was based on an assessment of aging over a cumulative 60-year licensed service period. Consistent with the guidance in Section 3.1.2.2.9 of Standard Review Plan for Subsequent License Renewal of Nuclear Power Plants (Section 3.1.2.2.9 of the SRP-SLR, as updated in Appendix C of NRC Interim Staff Guidance No. SLR-ISG-2021-01-PWRVI (ADAMS Accession No. ML20217L203)), some PWR licensees that submitted SLRAs in accordance with 10 CFR Part 54 processed the 80 year version of their PWR Vessel Internals Program based on the guidelines in MRP-227, Revision 1-A, as a starting point, as subject to the results of an 80 year site-specific or unit-specific gap analysis for the RVI components.

The gap analyses for these PWR units were performed to determine those modifications of the I&E bases in MRP-227, Revision 1-A, methodology that would be needed on an as-needed component-specific basis to account to potential aging needs during the additional 60 – 80 year time frame. Thus, the SLR versions of the PWR Vessel Internals Programs for these plants were based on “MRP-227” I&E criteria that preceded the EPRI MRP’s development of the updated 80 year I&E guidelines in MRP-227, Revision 2. However, PWR Vessel Internals Programs are considered living programs by the EPRI MRP. For licensees owning PWRs with subsequent renewed licensing bases of this sort, EPRI MRP should be prepared to discuss whether (and if so, how) the licensee’s internal commitment to NEI 03-08 (plant version of record) or the EPRI MRP would call for update to MRP-227, Revision 2 (anticipated staff approved version) based on the implementation criteria that are defined in Chapter 7 of MRP-227, Revision 2.

VIII. Timing of Inspections During the Subsequent Period of Extended Operation

- Many of the line items for Primary category components in Tables 4-1, 4-2, and 4-3 includes the following type of inspection implementation (i.e., inspection time) clause for the component-specific Primary inspections that will be performed during the subsequent period of extended operation: “*no later than two refueling outages from the beginning of the license renewal period and subsequent examination at a 10-year interval.*” The NRC staff understands that this is a carry over from the prior version in MRP-227, Revision 1-A, but we are dealing with an additional twenty years of operation for the plants beyond the first twenty years that were added in the initial renewed licensing periods. Thus, EPRI MRP should be prepared to discuss whether this is referring to performance of the inspections at least two years prior to entry into the subsequent period of extended operation or performance of the inspections within two refueling outages occurring from and after the initial date of entering the subsequent period of extended operation. If it is later case, EPRI MRP should be prepared to discuss and justify why performance of initial inspection is sufficient after plant entry into the subsequent period of extended operation. NOTE: we understand that the subsequent inspections would be set by the 10-year interval basis.

BABCOCK AND WILCOX DESIGN-SPECIFIC AUDIT TOPICS

FOR TABLES 3-1, 4-1, 4-4, AND 5-1 IN MRP-227, REVISION 2

The component-specific line items in the tabular audit discussion tables in this enclosure are color coded as follows in order to convey whether the component-specific topics warrant audit discussions, and if so, the degree of audit discussions that are merited on the component-specific audit topic: (1) **blue** color highlighted content conveys the component-specific topic does not need to be included in audit discussions, (2) **yellow** color highlighted content conveys the component-specific topic warrants some limited audit discussion, and (3) **green** color highlighted content conveys the component-specific topic warrants more detailed audit discussions.

I. AUDIT TABLE #B&W1 - ASSESSED MRP-227 CHAPTER 3, TABLE 3-1 B&W COMPONENT COMPARISONS – B&W COMPONENTS SUBJECT TO AUDIT FOR SCREENING RESULTS

Assembly/Component Description ³	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Plenum Cover (PC) Assembly Components							
PC Weldment Rib Pads	Yes	P	Yes	P	No	40-80: Still Primary	No need to include the screening basis for the PC weldment rib pads in the audit. SE/eSE to simply list the updated 80-year screening bases and final inspection category basis for the PC weldment rib pads as acceptable updated screening bases.
PC Support Pads	Yes	P	Yes	P	No	40-80: Still Primary	No need to include the screening basis for the PC support pads in the audit. SE/eSE to simply list the updated 80-year screening bases and final inspection category basis for the PC support pads as acceptable updated screening bases.
PC Support Ring	Yes	P	Yes	P	No	40-80: Still Primary	No need to include the screening basis for the PC support rings in the audit. SE/eSE to simply list the updated 80-year screening bases and final inspection category basis for the PC support rings as acceptable updated screening bases.
Alloy X-750 Dowel-to-PC Bottom Flange Weld (Welds are Alloy 82)	Yes	NAM	Yes	NAM	Yes	40-80: Audit to cover whether NAM categorization is still appropriate for 80 year considerations	Just need simple confirmation that NAM is the proper place to put these components for 80-year considerations
Alloy 69 Dowel-to-Rib Pad Locking Weld (ONS1)	Yes	NAM	Yes	NAM	Yes	40-80: Audit to cover whether NAM categorization is still appropriate for 80 year considerations	Just need simple confirmation that NAM is the proper place to put these components for 80-year considerations
PC rib-to-rib section welds (308L)	No	N/A	Yes	E	Yes	40-80: These types of welds were not included or evaluated as assessed components in Table 3-1 of MRP-227 Rev. 1-A.	Audit to cover why this PC rib-to-rib section welds were not included or evaluated as an assessed component type in Table 3-1 of MRP-227 Rev. 1-A and whether Expansion is an appropriate inspection category for 80-Years for the screws. Generic logistics issue for newly screened components applies here. Table 3-1 Note 2 basis (on fatigue) needs to be audited for this component type.

Assembly/Component Description ³	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Upper Grid Assembly (UGA) Components							
Fuel assembly support pad cap screws	Yes	NAM	Yes	E or NAM – See comment	Yes	60-80: In MRP-227 Rev. 2, Table 3-1, EPRI consolidated the entry for fuel assembly support pad cap screws and UGA dowel locking devices into one line item and allowed the final inspection category to be based on unit-specific assessment.	Audit to check final inspection categories for support pad, dowel, cap screw and locking weld components in the Rev. 2 commodity group line item listing. Also, is Framatome establishing the category as NAM for the fuel assembly cap screws and E for the UGA support pad dowel locking welds or leaving the inspection category for each of these component types up to a licensee-specific determination? Rev 2 Table 3-1 Note 3 and 4 bases need to be discussed
UGA support pads: Alloy X-750 dowel locking welds (welds are made from Alloy 82)	Yes	E	Yes	E or NAM – See comment	Yes	60-80: Comment immediately above applies. Additionally, Rev 2 Table 3-1 Note 3 and 4 bases need to be discussed.	Audit to check final inspection categories for support pad, dowel, cap screw and locking weld components in the Rev. 2 commodity group line item listing. Specifically, is Framatome establishing the inspection category as NAM for the fuel assembly cap screws and Expansion for the UGA support pad dowel locking welds or leaving the inspection category for each of these component types up to a licensee-specific determination? Rev 2 Table 3-1 Note 3 and 4 bases need to be discussed
Alloy X-750 Dowel-to-UGA Rib Section Welds (welds are made from Alloy 82)	Yes	NAM	Yes	NAM	Yes	40-80: Still NAM	Just need simple confirmation that NAM is the proper place to put these components for 80-year considerations
Rib-to-ring cap screws	No	N/A	Yes	NAM	Yes	60-80: The UGA rib-to-ring cap screws were no longer included as assessed components in Table 3-1 of MRP-227, Rev. 1-A.	Audit to cover why this type of cap screw was not included as an assessed component type in Table 3-1 of MRP-227 Rev. 1-A and whether NAM is an appropriate inspection category for 80-Years for the screws. Generic logistics issue for newly screened components applies here.
Control Rod Guide Tube (CRGT) Assembly Components							
CRGT flange-to-grid cap screws	No	N/A	Yes	NAM	Yes	60-80: The UGA rib-to-ring cap screws were no longer included as assessed components in Table 3-1 of MRP-227, Rev. 1-A	Audit to cover why this CRGT flange-to-grid cap screws were not included as an assessed component type in Table 3-1 of MRP-227 Rev. 1-A and whether NAM is an appropriate inspection category for 80-Years for the screws. Generic logistics issue for newly screened components applies here.

Assembly/Component Description ³	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
CRGT spacer castings	Yes	P	Yes	P	No	40-80: Still Primary	No need to include the screening basis for the CRGT spacer castings in the audit. SE/eSE to simply list the updated 80-year screening bases and final inspection category basis for the CRGT spacer castings as acceptable updated screening bases.
CRGT guide tubes	Yes	NAM	Yes	NAM	Yes	40-80: Still NAM	Just need simple confirmation that NAM is the proper place to put the CRGT guide tubes for 80-year considerations
CRGT sectors	Yes	NAM	Yes	NAM	Yes	40-80: Still NAM	Just need simple confirmation that NAM is the proper place to put the CRGT sectors for 80-year considerations
Reactor vessel level monitoring system (RVLMS) brazement guide assembly – J-bolts and nuts (ANO1)	No	N/A	Yes	NAM	Yes	40-60: The types of J-bolt components were not included as assessed components in Table 3-1 of MRP-227 Rev. 1-A.	60-80: The RVLMS J bolts and nuts are new assessed component types for the CRGT assemblies at ANO-1. Audit to explain why this is a newly assessed component for ANO-1 and why NAM is appropriate for 60-80. Generic logistics issue for newly screened components applies here.
Core Support Shield (CSS) Assembly Components							
CSS cylinder	No	N/A	Yes	E or NAM	Yes	40-60: The CSS cylinders were not included as assessed components in Table 3-1 of MRP-227 Rev. 1-A. 60-80: The line item screening basis for the CSS cylinders in Table 3-1 of MRP-227, Rev. 2 allows the final inspection category determination of the component to be based on an owner controlled evaluation of the component type (i.e., E or NAM category)	Audit to cover why the CSS cylinders were not included as assessed components in Table 3-1 of MRP-227 Rev. 1-A and leaving the final screening inspection categorization basis up to a licensee-specific determination (i.e., E or NAM) Rev 2 Table 3-1 Note 2 and 5 bases need to be discussed
CSS top flange	Yes	P	Yes	P or E or NAM	Yes	40-60: The CSS top flanges were Primary category components in MRP-227 R 1-A. 60-80: The line item screening basis for the CSS top flanges in Table 3-1 of MRP-227, Rev. 2 allows the final inspection category determination of the component to be based on an owner controlled evaluation of	Audit to investigate potential basis for downgrading the inspection category to E or NAM and leaving the final screening inspection categorization basis up to a licensee-specific determination (i.e., E or NAM) Rev 2. Table 3-1 Note 2 basis needs to be discussed.

Assembly/Component Description ³	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
						the component type (i.e., P, E, or NAM category).	
CSS bottom flange	No	N/A	Yes	E or NAM	Yes	<p>40-60: The CSS bottom flanges were Primary category components in MRP-227 R 1-A.</p> <p>60-80: The line item screening basis for the CSS bottom flanges in Table 3-1 of MRP-227, Rev. 2 allows the final inspection category determination of the component to be based on an owner controlled evaluation of the component type (i.e., E or NAM category).</p>	<p>Audit to cover why the CSS bottom flanges were not included as assessed components in Table 3-1 of MRP-227 Rev. 1-A and leaving the final screening inspection categorization basis up to a licensee-specific determination (i.e., E or NAM)</p> <p>Rev 2 Table 3-1 Note 2 and 5 bases need to be discussed</p>
CSS top flange circumferential weld	No	N/A	Yes	E	Yes	40-60: CSS top flange circumferential welds were not included as assessed components in Table 3-1 of MRP-227 Rev. 1-A	<p>Audit to cover why the CSS top flange circumferential welds were not included as assessed components in Table 3-1 of MRP-227 Rev. 1-A and whether the E category basis for welds is appropriate for 80 years. Generic logistics issue for newly screened components applies here.</p> <p>Rev 2 Table 3-1 Note 2 and 5 bases need to be discussed</p>
CSS bottom flange circumferential weld	No	N/A	Yes	E	Yes	40-60: CSS bottom flange circumferential welds were not included as assessed components in Table 3-1 of MRP-227 Rev. 1-A	<p>Audit to cover why the CSS bottom flange circumferential welds were not included as assessed components in Table 3-1 of MRP-227 Rev. 1-A and whether the E category basis for welds is appropriate for 80 years. Generic logistics issue for newly screened components applies here.</p> <p>Rev 2 Table 3-1 Note 2 and 5 bases need to be discussed</p>

Assembly/Component Description ³	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Upper core barrel (UCB) bolts and associated locking devices	Yes	P	Yes	P	No	40-80: UCB bolts are still Primary. 60-80: UCB bolt locking devices eliminated as age-managed category components in MRP-227, Rev. 2 (now NAM).	The updated screening bases and final inspection category for UCB bolts in Table 3-1 of MRP-227, Rev. 2 still keeps the UCB bolts as Primary category. For 60-80 year considerations, Table 2 that follows will open an audit of EPRI MRP's basis for eliminating the UCB bolt locking devices as age-managed category components and for placing them in NAM category.
Remaining surveillance specimen holder tube (SSHT) assemblies: bearings (ONS units only)	No	N/A	Yes	NAM	Yes	The SSHT bearings for the ONS units were not included as assessed components in Table 3-1 of MRP-227, Rev. 1-A.	Audit to cover why the SSHT bearings for the ONS units were not included as assessed components in Table 3-1 of MRP-227 Rev. 1-A and whether the NAM category basis for bearings is appropriate for 80 years. Generic logistics issue for newly screened components applies here.
Vent Valve (VV) Assemblies							
VV bodies	Yes	E	No	N/A	Yes	60-80: In Tables 4-1 and 4-4 of MRP-227, Rev. 1-A the VV bodies were (Item B2.1) were listed as Expansion category components for the CRGT spacer castings (Item B2). Screening bases and final inspection result for the VV bodies were included in Table 3-1 of MRP-227, Rev. 1-A. However, the updated version of Table 3-1 in MRP-227, Rev. 2 does not include the VV bodies.	Audit to cover Framatome's basis for removing VV bodies as assessed components in Table 3-1 of MRP-227 Rev. 2 – which essentially places them in the NAM category for 60-80 year considerations. The VV bodies are no longer listed as Expansion category component types for the CRGT spacer casting in Item B2 of Table 4-1 in MRP-227, Rev. 2 or Item B2.1 of Table 4-4 in MRP 227, Rev. 2.
VV top retaining ring	Yes	P	Yes	P	No	40-80: Still Primary w/o linked Expansion components.	No need to include the screening basis of the component type in the audit. Component will be listed in SE/eSE as an acceptable Primary component for 40-80 Year considerations.
VV bottom retaining rings	Yes	P	Yes	P	No	40-80: Still Primary w/o linked Expansion components.	No need to include the screening basis of the component type in the audit. Component will be listed in SE/eSE as an acceptable Primary component for 40-80 Year considerations.
VV original locking device type – pressure plate	Yes	P	Yes	P	No	40-80: Still Primary w/o linked Expansion components.	No need to include the screening basis of the component type in the audit. Component will be listed in SE/eSE as an acceptable Primary component for 40-80 Year considerations.

Assembly/Component Description ³	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
VV original locking device type – spring retainer	Yes	P	Yes	P	No	40-80: Still Primary w/o linked Expansion components.	No need to include the screening basis of the component type in the audit. Component will be listed in SE/eSE as an acceptable Primary component for 40-80 Year considerations.
VV original locking device type – spring	Yes	P	Yes	P	No	40-80: Still Primary w/o linked Expansion components.	No need to include the screening basis of the component type in the audit. Component will be listed in SE/eSE as an acceptable Primary component for 40-80 Year considerations.
VV original locking device type – U-cover	Yes	P	Yes	P	No	40-80: Still Primary w/o linked Expansion components.	No need to include the screening basis of the component type in the audit. Component will be listed in SE/eSE as an acceptable Primary component for 40-80 Year considerations.
VV original locking device type – key ring	Yes	P	Yes	P	No	40-80: Still Primary w/o linked Expansion components.	No need to include the screening basis of the component type in the audit. Component will be listed in SE/eSE as an acceptable Primary component for 40-80 Year considerations.
VV original locking device type – pin	Yes	P	Yes	P	No	40-80: Still Primary w/o linked Expansion components.	No need to include the screening basis of the component type in the audit. Component will be listed in SE/eSE as an acceptable Primary component for 40-80 Year considerations.
VV modified locking device type – bolted block	Yes	P	Yes	P	No	40-80: Still Primary w/o linked Expansion components.	No need to include the screening basis of the component type in the audit. Component will be listed in SE/eSE as an acceptable Primary component for 40-80 Year considerations.
VV original locking device type – jackscrew crimped locking cup	Yes	P	Yes	P	No	40-80: Still Primary w/o linked Expansion components.	No need to include the screening basis of the component type in the audit. Component will be listed in SE/eSE as an acceptable Primary component for 40-80 Year considerations.
VV original locking device type – bolted crimped locking cups	Yes	P	Yes	P	No	40-80: Still Primary w/o linked Expansion components.	No need to include the screening basis of the component type in the audit. Component will be listed in SE/eSE as an acceptable Primary component for 40-80 Year considerations.
Core Barrel (CB) Assembly Components							
CB top and bottom cylinders	Yes ⁴	E	Yes	P or NAM	Yes	60-80: Need to address Oconee SLRA lessons learned for 60-80 aging mechanism screening rankings and final inspection categorization bases of B&W-design core barrel base metal and weld components. Component accessibility bases for the components also need to be addressed.	Special audit screening review based on MRP-227 Rev. 2 Table 3-1 or 4-1 exclusions that would allow entry into NAM (if not weld repaired) and Oconee SLRA lessons learned. Rev 2 Table 3-1 Note 2, 5, 6, and 7 bases need to be discussed

Assembly/Component Description ³	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
CB cylinder top flange	Yes	NAM	Yes	P or NAM	Yes	60-80: Need to address Oconee SLRA lessons learned for 60-80 aging mechanism screening rankings and final inspection categorization bases of B&W-design core barrel base metal and weld components. Component accessibility bases for the components also need to be addressed.	Special audit screening review based on Rev. 2 Table 3-1 or 4-1 exclusions that would allow entry into NAM (if not weld repaired) and Oconee SLRA lessons learned. Rev 2 Table 3-1 Note 2 and 6 bases need to be discussed.
CB cylinder bottom flange	Yes	NAM	Yes	P	Yes	60-80: Final inspection category for the CB bottom flange in B&W design reactors is Primary (P). Yet Table 4-1 in MRP-227, Rev. 2 does not include a Primary component line item that defines the inspection bases for the CB bottom flange.	Audit to ascertain why Table 4-1 of Rev. 2 does not include a line item for this component when the final inspection category for this component type in Table 3-1 of MRP-227, Rev. 2 is Primary category. Otherwise, apply Oconee SLRA lessons learned for the final inspection category of this component type. Rev 2 Table 3-1 Note 2 and 5 bases need to be discussed.
CB top flange-to-top cylinder circumferential seam weld	Yes ²	E	Yes	P or NAM	Yes	60-80: Need to address Oconee SLRA lessons learned for 60-80 aging mechanism screening rankings and final inspection categorization bases of B&W-design core barrel base metal and weld components. Component accessibility bases for the components also need to be addressed.	Special screening review based on Rev. 2 Table 3-1 or 4-1 exclusions that would allow entry into NAM (if not weld repaired) and Oconee SLRA lessons learned. Rev 2 Table 3-1 Note 2 bases need to be discussed.
CB bottom flange-to-bottom cylinder circumferential seam weld	Yes ²	E	Yes	P	Yes	60-80: Final inspection category for the CB bottom flange-to-bottom cylinder circumferential welds in B&W design reactors is Primary (P). Yet Table 4-1 in MRP-227, Rev. 2 does not include a Primary component line item that defines the inspection bases for B&W-design CB bottom flange-to-bottom cylinder circumferential welds.	Audit to ascertain why Table 4-1 of Rev. 2 does not include a line item for this component when the final inspection category for this component type in Table 3-1 of MRP-227, Rev. 2 is Primary category. Otherwise, apply Oconee SLRA lessons learned for the final inspection category of the CB bottom flange and bottom flange-to-bottom cylinder circumferential weld. Rev 2 Table 3-1 Note 2 and 5 bases need to be discussed.

Assembly/Component Description ³	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
CB top cylinder and bottom cylinder vertical (axial) seam welds	Yes ²	E	Yes	P or NAM	Yes	60-80: Need to address Oconee SLRA lessons learned for 60-80 aging mechanism screening rankings and final inspection categorization bases of B&W-design core barrel base metal and weld components. Component accessibility bases for the components also need to be addressed.	Special screening review based on Rev. 2 Table 3-1 or 4-1 exclusions that would allow entry into NAM (if not weld repaired) and Oconee SLRA lessons learned. Rev 2 Table 3-1 Note 2 and 5 bases need to be discussed.
CB top cylinder-to-bottom cylinder center circumferential weld (middle circumferential weld)	Yes ²	E	Yes	P or NAM	Yes	60-80: Need to address Oconee SLRA lessons learned for 60-80 aging mechanism screening rankings and final inspection categorization bases of B&W-design core barrel base metal and weld components. Component accessibility bases for the components also need to be addressed.	Special screening review based on Rev. 2 Table 3-1 or 4-1 exclusions that would allow entry into NAM (if not weld repaired) and Oconee SLRA lessons learned. Rev 2 Table 3-1 Note 2, 5, and 7 bases need to be discussed.
Alloy X-750 core barrel top and bottom cylinders-to-former plate dowels	Yes	NAM	Yes	NAM	Yes	40-80: Still NAM.	40-80: Audit only to confirm NAM is still appropriate for these dowels.
Alloy X-750 dowel-to-top and bottom CB cylinder fillet welds (welds are made from Alloy 82)	Yes	NAM	Yes	NAM	Yes	40-80: Still NAM.	40-80: Audit only to confirm NAM is still appropriate for these types of CB fillet welds. Note: welds may be made from a susceptible Nickel-alloy weld filler metal material.
Lower core barrel (LCB) bolts (including locking devices)	Yes	P	Yes	P	No	40-80: The LCB bolts remain as Primary components that are linked to the Expansion category UTS and LTS bolts; 60-80: The LCB bolt locking devices are eliminated as age-managed components (now NAM for 60-80).	No need to include the LCB bolts in the audit of the screening table results. SE/eSE to simply list that the LCB bolts remain as Primary category components for 60-80 Year considerations with Expansion links to the Expansion category LTS and UTS bolts. Staff will open an audit of the basis for eliminating the UCB bolt locking devices as age-managed components in Table 2 that follows.
Upper thermal shield (UTS bolts (including locking devices)	Yes	E	Yes	E	No	40-80: The UTS bolts remain as Expansion components for the UCB, LCB, and FD bolts; 60-80: The UTS bolt locking devices are eliminated as age-	No need to include the UTS bolts in the audit of the screening table results. SE/eSE to simply list that the UTS bolts remain as Expansion category components for 60-80 that are linked to the Primary UCB, LCB, and FD bolts.

Assembly/Component Description ³	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
						managed components (now NAM for 60-80).	Staff will open an audit of the basis for eliminating the UTS bolt locking devices as age-managed components in Table 3 that follows.
Alloy X-750 dowel-to-core barrel cylinder welds (both ends) (welds are made for Alloy 82)	Yes	NAM	Yes	NAM	Yes	These dowels welds are made from Nickel-based alloy filler metals that are potentially susceptible to stress corrosion cracking (SCC) mechanism.	Audit to confirm basis for remaining NAM given that the referenced welds are made from Nickle-based Alloy 82 weld filler metals that are potentially susceptible to SCC.
Remaining surveillance specimen holder tube (SSHT) hex head bolts (i.e., those in the ONS and ANO1 units)	Yes	NAM	Yes	NAM	Yes	40-60: Only the SSHT bolts and bolt locking devices at Davis Besse were Expansion category components for the UCB, LCB, and FD bolts and bolt locking devices. 60-80: Still NAM for SSHT bolts and bolt locking devices at ONS and ANO-1.	Only to consider whether the SSHT bolts at ONS and ANO1 are still okay for NAM category when corresponding bolts and bolt locking devices at DB are being elevated from Expansion to Primary. Table 2 that follows will address the basis for not aging managing SSHT bolt locking devices for 60-80 (now NAM for 60-80).
Baffle plates	Yes	P	Yes	P	No	40-80: Still Primary. 60-80: Linked Expansion category components have changed to eliminate the core barrel components as linked Expansion components. Only the former plates are Expansion for 60-80.	No need to include the screening bases and final inspection category of the baffle plates in the audit. SE/eSE only to list that the baffle plates remain Primary and explain the changes to Expansion components linked to the baffle plates (i.e., core barrel cylinder base metal components and welds are no longer Expansion components for the baffle plates).
Former plates	Yes	E	Yes	E	No	40-80: Still Expansion for the Primary baffle plates.	No need to include the screening bases and final inspection category of the former plates in the audit if the screening results. Okay with still keeping the former plates as Expansion items. SE/eSE only to list that the former plates remain Expansion category components linked to the baffle plates.
Core barrel top and bottom cylinder-to-former plate dowels (X-750 dowel materials)	No	N/A	Yes	NAM	Yes	40-60: These types of core barrel dowels were not previously included as assessed components for aging mechanism screening assessments in Table 3-1 of MRP-227, Rev. 1-A.	Audit to cover why these type of CB dowels were not included as assessed components in Table 3-1 of MRP-227 Rev. 1-A and whether the NAM category basis for the dowels is appropriate for 80 years. Generic logistics issue for newly screened components applies here.

Assembly/Component Description ³	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Core barrel-to-former bolts (CB bolts)	Yes	E	Yes	E	No	40-80: Still Expansion bolts for the Primary baffle-former (FB) bolts.	No need to include the screening bases and final inspection category of the CB bolts in the audit. Okay with still keeping the CB bolts as Expansion items. SE/eSE only to list that the CB bolts remain as applicable Expansion category components linked to the baffle-to-former bolts (FB bolts).
Baffle-to-former bolts (FB bolts)	Yes	P	Yes	P	No	40-80: Still Primary w/ links to the CB bolts and internal and external baffle-to-baffle (BB) bolts.	No need to include the screening bases and final inspection category of the FB bolts in the audit. SE/eSE only to list that the FB bolts remain as applicable Primary category components with Expansion links to the CB bolts and internal and external baffle-to-baffle bolts (internal and external BB bolts).
Internal baffle-to-baffle bolts (internal BB bolts) / External BB bolts	Yes	E	Yes	E	No	40-80: Still Expansion bolt types for the FB bolts.	No need to include the screening bases and final inspection category of the internal and external BB bolts in the audit. Okay with still keeping the internal and external BB bolts as Expansion items. SE/eSE only to list that the internal and external BB bolts remain as applicable Expansion category components linked to the baffle-to-former bolts (FB bolts).
Accessible bolt locking device/locking welds (applies to those for FB bolts and internal BB bolts)	Yes	P	Yes	P	No	40-80: Still Primary locking devices w/ links to the Expansion category CB bolt locking devices and external BB bolt locking devices.	No need to include the screening bases and final inspection category of the FB bolt locking devices and internal BB bolt locking devices in the audit. SE/eSE only to list that these types of locking devices remain as Primary category components with applicable Expansion category links to the Expansion category CB bolt locking devices and external BB bolt lock devices.
Inaccessible bolt locking device/locking welds (applies to those for CB bolts and external BB bolts)	Yes	E	Yes	E	No	40-80: Still Expansion locking device types w/ links to the Primary category FB bolt locking devices and internal BB bolt locking devices. NOTE: These type of bolt locking devices are inaccessible to inspection. If <i>expansion</i> is warranted by the results of the Primary inspections of the FB bolt locking devices or internal BB bolt locking devices, the justify by component analysis	No need to include the screening bases and final inspection category of the CB bolt locking devices and external BB bolt locking devices in the audit. Okay with still keeping the CB bolts locking devices and external BB bolt locking device as Expansion items. SE/eSE only to list that these types of locking devices remain as inaccessible Expansion category components with applicable links to the Primary category FB bolt locking devices and internal BB bolt lock devices. SE/eSE to explain that If <i>expansion</i> is warranted by the results of the Primary

Assembly/Component Description ³	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
						for the Expansion category bolt locking device types.	inspections of the FB bolt locking devices or internal BB bolt locking devices, then justify by component analysis for these Expansion category bolt locking device types.
Surveillance specimen holder tube (SSHT) bolts and associated components (including tie plates, crimped locking cup, and compression collars and washers – DB only)	Yes	E	Yes	P	No	60-80: Framatome conservatively bumped inspection category for Davis Besse's SSHT bolt and bolting components from Primary to Expansion – no need to include these components in the audit for assessing screening result changes in Rev. 2	No need to include the screening bases and final inspection category of the Davis Besse SSHT bolts in the audit. Framatome has elevated the final inspection category of these bolts to Primary category components represents a conservative, acceptable change. SE/eSE to simply list that the Davis Besse SSHT bolts are now Primary category components for 60-80 Year considerations. Table 2 that follows will open an audit of the basis for eliminating the SSHT bolt locking devices as age-managed category components (i.e., is they are now NAM).
Lower Grid Assembly (LGA) Components							
Lower rib gird sections	Yes	E	Yes	P	No	60-80: The lower grid rib sections has been elevated from designated Expansion category components to Primary category components.	No need to include the lower grid rib sections in the audit of the screening table results. Okay with elevating the inspection of the rib sections from Expansion category to Primary category components. SE/eSE to simply list that the lower grid rib sections are now Primary category components for 60-80 Year considerations.
LGA support pad items (pads, pad-to-rib section welds, Alloy X-750 dowel, caps screws and locking welds)	Yes	E	Yes	P or E or NAM	Yes	60-80: In MRP-227 Rev. 2, Table 3-1, EPRI amended the line item entry for LGA support pad items to allow the final inspection category to be based on unit-specific assessment. Rev 2 Table 3-1 Note 3 and 4 bases need to be discussed	These LGA support pad items were designated as Expansion category components in MRP-227 Rev. 1-A, with the corresponding Primary components being the IMI spiders and spider-to-lower grid rib section welds. Audit to investigate the basis and adequacy of the new wide-spread inspection category variability for these support pad items.
Lower grid rib-to-shell forging cap screws	No	N/A	Yes	NAM	Yes	40-60: The lower gird rib section forging cap screws were not included or evaluated as assessed components for screening in Table 3-1 of MRP-227, Rev. 1-A.	Audit to cover why these types of LGA cap screws were not included as assessed components in Table 3-1 of MRP-227 Rev. 1-A and whether the E category basis for welds is appropriate for 80 years. Generic logistics

Assembly/Component Description ³	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
							issue for newly screened components applies here.
LGA Alloy X-750 dowel-to-guide block welds (All but DB; welds are Alloy 82)	Yes	P	Yes	P	No	40-80: The dowel-to-guide block welds remain Primary components for the Rev. 2 basis	No need to include the LGA dowel-to-guide block welds in the audit of the screening table results. SE/eSE to simply list that the LGA dowel-to-guide block welds remain as Primary category components for 60-80 Year considerations.
Lower gird guide block bolts (All but DB)	No	N/A	Yes	NAM	Yes	40-60: The lower gird guide block bolts were not included or evaluated as assessed components for screening in Table 3-1 of MRP-227, Rev. 1-A.	Audit to discuss why these guide block bolts were not listed as assessed components in Table 3-1 of Rev. 1-A and whether the new NAM basis for these bolts is appropriate. Generic logistics issue for newly screened components applies here.
Lower grid shell forgings (ONS1 Only) And Lower grid weldment rib pads (ONS-1 only) Lower grid shell forgings and lower grid weldment rib pads - Continued	Yes	NAM	No	N/A	Yes	40-60: The lower grid shell forgings and lower grid weldment rib pads for ONS-1 were included or evaluated as assessed components for screening in Table 3-1 of MRP-227, Rev. 1-A. 60-80: The lower grid shell forgings and lower grid weldment rib pads for ONS-1 were not included or evaluated as assessed components for screening in Table 3-1 of MRP-227, Rev. 1-A.	Audit to discuss why the lower grid shell forgings and lower grid weldment rib pads are no longer included and evaluated as assessed components for screening in Table 3-1 of MRP-227, Rev. 2
Alloy X-750 dowel-to-lower grid shell forging welds (welds are Alloy 82)	Yes	NAM	Yes	NAM	Yes	40-80: Still NAM.	40-80: Audit only to confirm NAM is still appropriate for these forging welds. Note: welds may be fabricated from a susceptible Nickel-ally filler metal material.
Alloy X-750 dowel-to-lower grid rib section welds (welds are Alloy 69)	Yes	NAM	Yes	NAM	Yes	40-80: Still NAM.	40-80: Audit only to confirm NAM is still appropriate for these grid section welds. Note: welds may be fabricated from a susceptible Nickel-ally filler metal material.
Lower grid rib-to-shell forging cap screws	Yes	NAM	No	N/A	Yes	40-60: The lower grid rib-to-shell forging cap screws were included and evaluated as assessed components for screening in Table 3-1 of MRP-227, Rev. 1-A.	Audit to discuss why the lower grid weldment rib-to-shell forging cap screws are no longer listed and included as assessed components in Table 3-1 of the Rev. 2 version.

Assembly/Component Description ³	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
						60-80: The lower grid rib-to-shell forging cap screws were note included or evaluated as assessed components for screening in Table 3-1 of MRP-227, Rev. 1-A.	
Lower grid support post pipe cap screws	Yes	NAM	Yes	NAM	Yes	Still NAM.	40-80: Audit only to confirm NAM is still appropriate for lower grid support post pipe caps screws.
Lower thermal shield (LTS) bolts/studs (including locking devices/locking welds; and including the nuts for the LTS studs in the ONS units) LTS Stud/Bolts - Continued	Yes	E	Yes	E	No	60-80: LTS bolts/studs/nuts remain Expansion category components linked to the Primary category UCB, LCB, and FD bolts. However, LTS bolt/stud locking devices eliminated as age-managed components in MRP-227, Rev. 2 (now NAM)	No need to include the LTS bolts/studs/nuts in the audit of the Table 3-1 screening results. The LTS bolts/studs remain as expansion components for the UCB, LCB, and FD bolts. SE/eSE to simply list that the LTS bolts/studs remain as Primary category components for 60-80 Year considerations. However, Table 3 that follows will open an audit on the basis for eliminating the LTS bolt/stud locking devices as Expansion category components.
LGA Alloy X-750 dowel-to-support pad welds	No	NA	No	NA	Yes	Neither version of Table 3-1 in MRP-227, Rev. 1-A or MRP-227, Rev. 2 includes an applicable component-specific screening line item for these types of LGA welds. Yet the LGA dowel-to-support pad welds are listed as applicable Expansion category components (linked to the Primary LGA Alloy X-750 dowel-to-guide block welds – Item B13) per Item B13.2 in Table 4-4 of these MRP reports.	Audit to establish why LGA Alloy X-750 dowel-to-support pad welds were not subject to an applicable screening-based line item in Table 3-1 of MRP-227, Rev. 1-A and Rev. 2 when (per Item B13.2) they are certainly established and maintained as Expansion category weld component types for the Primary Alloy X-750 dowel-to-guide block welds (Item B13) in Tables 4-1 and 4-4 of MRP-227, Rev. 2. What is the weld filler metal material of fabrication for the LGA Alloy X-750 dowel-to-support pad welds (it is the dowel base metals that are X-750, not the welds)?
Flow Distributor (DB) Assembly							
FD bolts (and associated locking devices)	Yes	P	Yes	P	No	40-80: The FD bolts remain as Primary components that are linked to the Expansion category UTS and LTS bolts;	No need to include the FD bolts in the audit of the screening table results. SE/eSE to simply list that the FD bolts remain as Primary category components for 60-80 Year

Assembly/Component Description ³	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
						60-80: The FD bolt locking devices are eliminated as age-managed components (now NAM for 60-80).	considerations with Expansion links to the Expansion category LTS and UTS bolts. Staff will open an audit of the basis for eliminating the FD bolt locking devices as age-managed components in Table 2 that follows.
Alloy X-750 dowel-to-flow distributor flange welds (weld filler metals are Alloy 82)	Yes	NAM	Yes	NAM	Yes	40-80: The dowel-to-FD flange welds remain NAM.	40-80: Audit only to confirm NAM is still appropriate for the dowel-to FD flange welds. Note: welds may be made from a susceptible Nickel-based alloy material.
Incore Monitoring Instrument (IMI) Guide Tubes Assemblies							
IMI guide tubes and tube nuts	Yes	NAM	Yes	NAM	Yes	40-80: The IMI guide tubes and guide tube nuts remain NAM.	40-80: Audit only to confirm NAM is still appropriate for the IMI guide tubes and guide tube nuts.
IMI guide tube spiders (spiders are CF8 CASS)	Yes	P	Yes	P or NAM	Yes	60-80: The line item screening basis for the IMI guide tube spiders in Table 3-1 of MRP-227, Rev. 2 now allows the final inspection category determination of the component to be based on an owner controlled evaluation of the component type (i.e., E or NAM category). 60-80: Upper grid assembly support pad item added as additional Expansion linked components for the IMI spiders (in addition to the lower grid support pad items as Expansion).	This variable determination change definitely needs to be audited, particularly when Table 4-1 is listing the IMI guide tube spiders as applicable Primary type components.
IMI spider-to-lower grid rib section welds (welds are 308L weld filler metal)	Yes	P	Yes	P	No	40-80: Still Primary. 60-80: Upper grid assembly support pad item welds added as additional Expansion linked components for the IMI spiders	No need to include the UTS in the audit of the screening table results. SE/eSE to simply list that the UTS bolts remain as Expansion category components for 60-80 that are linked to the Primary UCB, LCB, and FD bolts.

Assembly/Component Description ³	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
						welds (in addition to the lower grid support pad item welds as Expansion).	Staff will open an audit of the basis for eliminating the UTS bolt locking devices as age-managed components in Table 3 that follows.

TABLE #B&W1 NOTES:

1. Inspection Category Column Entry Abbreviations: (1) P – “Primary” Inspection Category, (2) E – “Expansion” Inspection Category, (3) NAM – “No Additional Measures” Inspection Category, and (4) N/A – not applicable.
2. For audit objectives, the staff has screened the component-specific aging mechanism screening and inspection category basis in MRP-227, Rev. 2 Table 3-1 in accordance with the following color coded and highlighted text – (1) **Blue** highlighted text – component-specific screening results and final inspection category in Table 3-1 of MRP-227, Rev. 2 for the specified component type do not need to be within the scope of the audit, (2) **Yellow** highlight text – aging mechanism screening results or final inspection category for the designated component type is subject to a limited audit review for the screening result basis but only to confirm the same inspection category in Table 3-1 of MRP-227, Rev. 1-A can carry forward as the component-specific screening basis in Table 3-1 of MRP-227, Rev. 2; and (3) **Green** highlighted text – aging mechanism screening results or final inspection category for the designated component type in Table 3-1 of MRP-227, Rev. 2 needs to be subject to more detailed audit discussions, included applicable item specific Note bases that apply to the component type in Table 3-1 of MRP-227, Rev. 2.
3. Three Mile Island (TMI or TMI1) only items are not listed in this table and do not need to be part of the audit, as both TMI units have decommissioned. The B&W unit in Crystal River has also decommissioned.
4. For the listed B&W design core barrel (CB) assembly component type, the corresponding screening basis for the component type in Table 3-1 of MRP-227, Rev. 1-A was included within the scope of a single commodity group-based line item “Core barrel cylinder (including vertical and circumferential seam welds).”

II. AUDIT TABLE #B&W2 - ASSESSED MRP-227 CHAPTER 4, TABLE 4-1 B&W COMPONENT COMPARISONS – B&W PRIMARY CATEGORY COMPONENTS INSPECTION RESULT CRITERIA REVISIONS IN REV. 2¹

EPRI MRP Primary Item No. Designation And Component/Scope of Units	Included as Primary in Rev. 1-A?	Method, Frequency, and Expansion Links in Rev. 1-A / Mechanism(s) of Interest	Included as Primary in Rev. 2?	Method, Frequency, and Expansion Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Primary Plenum Cover (PC) Assembly and Core Support Shield (CSS) Assembly Components							
B1.a. PC weldment rib pads (All B&W units)	Yes	Initial physical measurement no later than two outages into initial PEO. Subsequent VT-3 visuals of accessible component surfaces for wear and loss of clamping preload once every 10 years. No Expansion Linked Components.	Yes	Same as those for the components in Rev. 1-A, but eliminating need for the one-time physical measurement	No	Staff confirmed no need for initial physical measurements during the SLR period, as they were needed only for the initial LR period. Other than that, criteria for re-inspecting the referenced PC and CSS components has not changed and does not need to change in in Rev. 2.	No need to include the 40-80 year inspection criteria for these components in the audit. SE/eSE to simply list (by appropriate bullet list or table) that the inspection criteria for these components as acceptable unchanged items.
B1.b. PC support flange (All B&W units)	Yes		Yes				
B1.c. PC support ring (All B&W units)	Yes		Yes	No Expansion Linked Components			
B1.d. CSS top flange (All B&W units)	Yes		Yes				
Primary Control Rod Guide Tube (CRGT) Assembly Components							
B2. CRGT spacer castings (All B&W units) (690 castings in ONS units and DB; 680 castings at ANO1 based on plant-mod that limited access to some of the spacer castings – EPRI Table 4-1 Note 6 in Rev. 2)	Yes	VT-3 visual exams of accessible spacer casting surfaces for evidence of cracking; augmented VT-3s performed once every 10 years. 40-60: Expand to Item B2.1, VV bodies.	Yes	Same as those for the Rev. 1-A; Note 5 in Rev. 2 table explains VT-3s look for evidence of cracking indicative of LOFT/TE mechanisms. 40-80: No longer Expand to VV Bodies	Yes	Criteria for inspecting the CRGT spacer castings has not changed and does not need to change in Rev. 2. However, audit to confirm validity and adequacy of technical basis for eliminating Expansion to VV bodies when considering 40-80.	[Question: If eliminating the CASS VV bodies as Expansion components for Item B2 and for deleting Item B2.1, "Vent Valve Bodies," in Table 4-4 of MRP-227 Rev. 2, is there a better alternative Expansion component type for the CASS CRGT spacer castings?] [*** Highly relevant logistics issue: For 40-80, is elimination of the VV bodies as cited Expansion components for the CRGT spacer casting over 40-80 re-opening our April 25, 2019, SE conclusions for 40-60 linked Expansion components in MRP-227, Rev. 1-A (which includes the VV bodies as Expansion components for the CRGT spacer castings)?]

EPRI MRP Primary Item No. Designation And Component/Scope of Units	Included as Primary in Rev. 1-A?	Method, Frequency, and Expansion Links in Rev. 1-A / Mechanism(s) of Interest	Included as Primary in Rev. 2?	Method, Frequency, and Expansion Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Primary Vent Valve (VV) Assembly Components (NOTE: Inservice Testing [IST] criteria that go beyond the EPRI MRP augmented inspection criteria for Primary category VV components are defined in Note 5 of Table 4-1 in MRP-227 Rev. 1-A and in Note 7 of Table 4-1 in MRP-227 Rev. 2)							
B3.a. VV top retaining ring (All B&W units)	Yes	VT-3 visual examinations for evidence of cracking (indicative of TE) during the next 10-Year interval with subsequent VT-3s on a 10-year reinspection frequency. 40-60: No <i>Expansion</i> components.	Yes	40-80: VT3 criteria are identical to those for 40-60 (other than some admin changes to Note numbering). 40-80: No <i>Expansion</i> components.	No	None	No need to include the 40-80 year inspection criteria for these components in the audit. SE/eSE to simply list (by appropriate bullet list or table) that the inspection criteria for these components as acceptable unchanged items.
B3.b. VV bottom retaining ring (All B&W units)	Yes	VT-3 visual examinations for evidence of cracking (indicative of TE) during the next 10-Year interval with subsequent VT-3s on a 10-year reinspection frequency. 40-60: No <i>Expansion</i> components.	Yes	40-80: VT3 criteria are identical to those for 40-60 (other than some admin changes to Note numbering). 40-80: No <i>Expansion</i> components.	No	None	No need to include the 40-80 year inspection criteria for these components in the audit. SE/eSE to simply list (by appropriate bullet list or table) that the inspection criteria for these components as acceptable unchanged items.
B4. VV original locking devices (pressure plate, spring and spring retainer, and U cover) (All B&W units)	Yes	VT-3 visual examinations for evidence of LOM/wear during the next 10-Year interval with subsequent VT-3s on a 10-year reinspection frequency. 40-60: No <i>Expansion</i> components.	Yes	40-80: VT3 criteria are identical to those for 40-60 (other than some admin changes to Note numbering). 40-80: No <i>Expansion</i> components.	No	None	No need to include the 40-80 year inspection criteria for these components in the audit. SE/eSE to simply list (by appropriate bullet list or table) that the inspection criteria for these components as acceptable unchanged items.
B5. VV original locking devices (key ring and pin) (All B&W units)	Yes	VT-3 visual examinations for evidence of cracking (indicative of LOFT/TE) during the next 10-Year interval with subsequent VT-	Yes	40-80: VT3 criteria are identical to those for 40-60 (other than some admin changes to Note numbering).	No	None	No need to include the 40-80 year inspection criteria for these components in the audit. SE/eSE to simply list (by appropriate bullet list or table) that the inspection criteria for

EPRI MRP Primary Item No. Designation And Component/Scope of Units	Included as Primary in Rev. 1-A?	Method, Frequency, and Expansion Links in Rev. 1-A / Mechanism(s) of Interest	Included as Primary in Rev. 2?	Method, Frequency, and Expansion Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
		3s on a 10-year reinspection frequency. 40-60: No <i>Expansion</i> components.		40-80: No <i>Expansion</i> components.			these components as acceptable unchanged items.
B6. VV modified locking devices (bolt locking cup, jackscrew locking cap and bolted block) (ONS units and ANO-1 only)	Yes	VT-3 visuals for evidence of cracking (SCC) during the next 10-Year interval with subsequent VT-3s on a 10-year reinspection frequency. 40-60: No <i>Expansion</i> components.	Yes	40-80: VT3 criteria are identical to those for 40-60 (other than some admin changes to Note numbering). 40-80: No <i>Expansion</i> components.	No	None	No need to include the 40-80 year inspection criteria for these components in the audit. SE/eSE to simply list (by appropriate bullet list or table) that the inspection criteria for these components as acceptable unchanged items.
Primary Core Support Shield (CSS) Assembly Components							
B7. Upper core barrel (UCB) bolts and bolt locking devices (All B&W units)	Yes (Bolts: For Cracking [SCC-all bolts, Fatigue-for original bolts only) (Locking Devices: Cracking [fatigue], LOM/wear)	UT exams of 100% of accessible bolts and VT-3 visuals of the applicable bolt locking devices during the next 10-Year ISI interval with subsequent re- inspections on a 10-year interval basis. <i>40-60: Expand to the UTS and LTS bolt/bolt locking devices, and for DB, the SSHT bolts/bolt locking devices. Mechanisms are in previous column</i>	Yes – but bolts only (Bolts: For Cracking [SCC, Fatigue], LOFT/wear, and LOP/IC- ISR) See Note 9, Table 4-1, MRP-227 Rev. 2 for mechanisms listed above.	<i>Revised 40-60 and New 60-80 B7 line items:</i> Component- specific UT criteria for the UCB bolts are identical to those for 40-60 version of B7 in Rev. 1-A (other than some admin changes to Note numbering). <i>However, VT-3 of the UCB bolt lock devices eliminated in the revised 40-60 Year version of Item B7 and the new 60-80 Year version of Item B7 Table 4-1, MRP- 227 Rev. 2.</i>	Yes	Criteria for UT of the applicable UCB bolts has not changed and does not need to change in Rev. 2. <i>However, tech basis for eliminating VT-3 of the UCB bolt locking devices needs be audited.</i> For 60-80 Year basis; previously linked Expansion category SSHT bolts in Rev. 1-A (DB Only) are now Primary category components for Davis Besse (no need to audit this change). [NOTE: EPRI Minimum 75% population criterion needed for inspection credit by Note 6 in Table 4-1 of MRP-227, Rev. 1- A and by Note 8 in Table 4-1 of MRP-227 Rev. 2]	[*** Highly relevant logistics issue: For the revised 40-60 year B7 Item in Table 4-1, MRP-227 Rev. 2, EPRI is reopening our past approval of the prior version of Item B7 in Table 4-1 of MRP-227 Rev. 1-A (as defined, evaluated, and approved in our April 25, 2019, SE for MRP-227, Rev. 1- A; ADAMS Accession No. ML19081A001); this is due to the removal of the UCB locking devices as inspected Primary components items for the revised 40-60 year basis of Item B7 in Rev. 2, which is counter to the approved basis in the April 25, 2019, SE and include inspections of the UCB bolt locking devices. Yet in EPRI Transmittal Letter No. MRP 2022-013, dated May 9, 2022 (ADAMS ML22129A140), EPRI did not inform us that they wanted us to re-open our past approvals of the 40-60
B7. UCB bolts and bolt locking devices (Continued)				<i>Revised 40-60 Year Item B8: UCB bolts still expand to UTS, LTS and (for DB) to the SSHT bolts as well. Since the UCB bolt locking devices</i>			

EPRI MRP Primary Item No. Designation And Component/Scope of Units	Included as Primary in Rev. 1-A?	Method, Frequency, and Expansion Links in Rev. 1-A / Mechanism(s) of Interest	Included as Primary in Rev. 2?	Method, Frequency, and Expansion Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
				<p><u>are no longer age-managed for the revised 40-60 Year basis (i.e., NAM category), no expansions to associated UTS, LTS, or SSHT bolt locking device types.</u></p> <p><u>New 60-80 B7: UCB Bolts only Expand to the UTS and LTS bolts devices; no longer expand to DB SSHT bolts, and no locking devices expansions.</u></p>		<p>[NOTE For Audit Efficiency: We can group the audit discussions on elimination of bolt locking device inspections for the UCB, lower core barrel (LCB), flow distributor (FD), upper thermal shield (UTS), lower thermal shield (LTS), and surveillance specimen holder tube (SSHT) bolting types as a generic audit discussion for all of those B&W design bolting types; also for UCB, LCB, and FD bolts, need to audit expansion needs to UTS/LTS bolts based solely on SCC.]</p>	<p>component-specific I&E bases in MRP-227, Rev. 1-A (as approved in the April 25, 2019, SE) if the 40-60 screening or I&E criteria for component-specific locations were being changed in MRP-227, Rev. 2 differently from the way they were defined and approved in MRP-227 Rev. 1-A.]</p> <p>[Based on ONS SLRA Review Lessons Learned: Note 10 basis for UCB bolts in SLRA Table 4-1 of MRP-227, Rev. 2 should be discussed per ONS SLRA RAI B2.1.7-1 topic. Under this Note basis, EPRI will only expand to UTS bolt and LTS bolt/stud components if cracking detected in the UCB bolts is caused by stress corrosion cracking (SCC). During the ONS review, the staff informed Framatome that the UT inspections of the UCB bolts could not distinguish between cracking initiated by fatigue and cracking initiated by SCC or IASCC. The staff also told the licensee owning ONS that they would need an Exception to GALL-SLR AMP XI.M16A for this type of basis.]</p>
Primary Core Barrel (CB) Assembly Components							
<p>B8. Lower core barrel (LCB) bolts and bolt locking devices</p> <p>(All B&W units)</p>	<p>Yes</p> <p>(Bolts: For Cracking [SCC, Fatigue], LOFT/wear, and</p>	<p>UT exams of 100% of accessible bolts and VT-3 visuals of the applicable bolt locking devices during the next 10-Year ISI interval with subsequent re-inspections on a</p>	<p>Yes – but bolts only</p> <p>(Bolts: For Cracking [SCC, Fatigue], LOFT/wear,</p>	<p>Revised 40-60 and New 60-80 B7 line items: Component-specific UT criteria for the LCB bolts are identical to those for 40-60 version of B8 in Rev. 1-A (other than some admin changes</p>	<p>Yes</p>	<p>Criteria for UT of the applicable LCB bolts has not changed and does not need to change in Rev. 2. However, tech basis for eliminating VT-3 of the LCB bolt locking devices needs be audited. For 60-80 Year</p>	<p>[*** Highly relevant logistics issue: For LCB bolt and bolt locking device considerations, the same type of Logistics and ONS SLRA Lessons Learned Issues discussed in the B7 line item above for UCB bolt and bolt locking devices also apply to the Revised 40-60 Year Item</p>

EPRI MRP Primary Item No. Designation And Component/Scope of Units	Included as Primary in Rev. 1-A?	Method, Frequency, and Expansion Links in Rev. 1-A / Mechanism(s) of Interest	Included as Primary in Rev. 2?	Method, Frequency, and Expansion Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
B8. LCB bolts and bolt locking devices (Continued)	LOP/IC-ISR) (Locking Devices: Cracking [fatigue], LOM/wear)	10-year interval basis. <i>40-60: Expand</i> to the UTS and LTS bolt/bolt locking devices, and for DB, the SSHT bolts/bolt locking devices. Mechanisms are in previous column.	and LOP/IC-ISR) See Note 9, Table 4-1, MRP-227 Rev. 2 for mechanisms listed above.	to Note numbering). However, VT-3 of <u>the LCB bolt lock devices eliminated in the revised 40-60 Year version of Item B8 and the new 60-80 Year version of Item B8 Table 4-1, MRP-227 Rev. 2.</u> <u>Revised 40-60 Year Item B8: LCB bolts still expand to UTS, LTS and (for DB) to the SSHT bolts as well. Since the LCB bolt locking devices are no longer age-managed for revised 40-60 Year basis (i.e., NAM category), no expansions to associated UTS, LTS, or SSHT bolt locking device types.</u> <u>New 60-80 Year Item B8: LCB Bolts only Expand to the UTS and LTS bolts devices; no longer expand to DB SSHT bolts, and no locking devices expansions.</u>		basis; previously linked Expansion category SSHT bolts in Rev. 1-A (DB Only) are now Primary category components for Davis Besse (no need to audit this change). [NOTE: EPRI Minimum 75% population criterion needed for inspection credit by Note 6 in Table 4-1 of MRP-227, Rev. 1-A and by Note 8 in Table 4-1 of MRP-227 Rev. 2] [NOTE For Audit Efficiency: We can group the audit discussions on elimination of bolt locking device inspections for the UCB, lower core barrel (LCB), flow distributor (FD), upper thermal shield (UTS), lower thermal shield (LTS), and surveillance specimen holder tube (SSHT) bolting types as a generic audit discussion for all of those B&W design bolting types; also for UCB, LCB, and FD bolts, need to audit the revised and limited expansion link bases for UTS/LTS bolts based solely on detection of SCC in the UCB, LCB, of FD bolts.]	B8 and New 60-80 Item line item considerations for LCB bolts in Table 4-1 of MRP-227, Rev. 2. That is: (1) EPRI is changing the 40-60 Year criteria for LCB bolts differently from that approved for the bolts in the April 25, 2019, SE for MRP-227, Rev. 1-A (which includes VT-3 inspections of the LCB bolt locking devices, and (2) UT inspections of the LCB bolts cannot distinguish evidence of cracking by fatigue from evidence of cracking initiated by SCC or IASCC]
B9 Baffle-to-Former Bolts (FB Bolts) (All B&W units)	Yes	UT exams of 100% of accessible FB bolts for evidence of cracking (IASCC, fatigue,	Yes	<u>Revised 40-60 Year and New 60-80 Year B9 line items: Component-specific</u>	No	<u>Item B8 Table Note criteria in Table 4-1, MRP-227, Rev. 2:</u>	No need to include the revised 40-60 Item B9 criteria and new 60-80 B9 Item criteria for FB bolts in Table 4-1, MRP 227,

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		<p>overload), LOP/ISR-IC, or LOM/wear during the next 10-Year ISI interval with subsequent re-inspections on a 10-year interval basis.</p> <p><i>40-60: Expand to the baffle-to-baffle (BB) bolts and core barrel-to-former bolts. Mechanisms are in previous column.</i></p>		<p>UT criteria for the FB bolts are identical to those for 40-60 Year version of B9 in Rev. 1-A (other than some admin changes to Note numbering).</p> <p><i>Revised 40-60 Year and New 60-80 Year B9 line items:</i> Like the 40-60 Year B9 item in MRP-227, Rev. 1-A, expand to the BB bolts and CB bolts.</p>		<p>Note 5 – UT inspections for cracking can indirectly look for LOFT/IE or reduction in ductility</p> <p>Note 8 and 9 – For inspection credit, EPRI sets minimum 75% of bolt population to be inspected by UT; additional note clarifications on how the UT inspections bases relate to aging effects/mechanisms.</p> <p>Note 12 – Assumes initial UT baselines have been done during LR period.</p>	<p>Rev. 2 in the audit given that they do not need to change for or 60 year and 80 year inspection considerations for B&W design FB bolt inspections. SE/eSE to simply list (by appropriate bullet list or table) that the inspection criteria for these components as acceptable unchanged items.</p>
<p>B10. Baffle Plates (All B&W units)</p> <p>B10 Baffle Plates - Continued</p>	<p>Yes</p>	<p>VT-3 visual exams of 100% of accessible plate surfaces around each flow and bolt hole for evidence of cracking (for evidence of irradiation embrittlement [IE]) during the next 10-Year ISI interval with subsequent re-inspections on a 10-year interval basis.</p> <p><i>40-60: Expand to the core barrel cylinder circumferential and axial welds seams and the former plates in the CB assembly, and the lower grid rib sections in the lower support structure (Items B10.1, B10-2,</i></p>	<p>Yes</p>	<p><i>Revised 40-60 Year and New 60-80 Year B10 line items:</i> Component-specific VT-3 criteria for the baffle plates are identical to those for 40-60 Year version of B10 in Rev. 1-A (other than some admin changes to Note numbering).</p> <p><i>Revised 40-60 Year:</i> The baffle plates now only <i>expand</i> to the LSS lower grid rib sections (i.e., new 40-60 Item B10.3 in Table 4-4 of MRP-227, Rev.2); for the revised 40-60 year basis, inspections of the baffle plates would no longer</p>	<p>Yes</p>	<p>The revised 40-60 Year expansion link changes for baffle plate Line Item B10 in Table 4-1 of MRP-227, Rev. 2 and the new 60-80 Year expansion link basis for the baffle plates need to be audited.</p>	<p>For 40-60 Year baffle plate considerations, the same type of Logistics and ONS SLRA Lessons Learned Issues discussed in the B7 line item above for UCB bolt and bolt locking devices also apply to the Revised 40-60 Year Item B11 for the baffle plates in MRP-227, Rev. 2. That is, EPRI is changing the 40-60 criteria for the baffle plates differently from that approved for the baffle plates in the April 25, 2019, SE for MRP-227, Rev. 1-A (where the VT-3 inspections of the baffle plates per MRP-227, Rev. 1-A would expand to the CB assembly axial and circumferential seams welds, the former plates, and the lower grid rib sections, but now only to the lower grid rib sections in the revised 40-60 year line item B10 for Table 4-1</p>

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		and B10.3 in Table 4-4 of MRP-227, Rev. 1-A).		expand to CB cylinder axial and circumferential seams welds or the former plates for the updated 40-60 Year considerations. <i>New 60-80 Year B10 line items – Expansion Links:</i> For the 60-80 SLR-based Line item B10 in MRP-227, Rev. 2, the VT-3 visual inspections, the linked Expansion category components are being changed only to the former plates (i.e., the Item B10.2 components in Table 4-4 of MRP-227 Rev. 2)			in MRP-227, Rev. 2). Logistically this re-opens our April 25, 2019, approved 40-60 Year I&E basis for the baffle plates inspections and linked Expansion category components. 80-60 Year Considerations: Deleting expansion to lower grid rib sections is acceptable because per new 60-80 Year Item B18 in Table 4-1 of MRP-227, Rev. 2, the rib sections are now Primary components. But audit to ask why the expansion bases for the baffle plates no longer expand CB welds.
B11. Locking devices (including locking welds) of FB bolts and internal baffle-to-baffle (BB) bolts (All B&W units) B11 Locking devices of FB bolts and internal BB bolts - Continued	Yes	VT-3 visual exams of 100% of accessible FB and internal BB bolt locking devices for evidence of cracking (for evidence of irradiation embrittlement [IE] or IASCC) during the next 10-Year ISI interval with subsequent re-inspections on a 10-year interval basis. <i>40-60: Expand to the locking devices of the core barrel-to-former (CB) and external baffle-to-baffle (BB)</i>	Yes	<i>New 60-80 Year B11 line item:</i> Component-specific VT-3 criteria for the referenced FB bolt locking devices/locking welds are identical to those for 40-60 Year version of B11 in Rev. 1-A (other than some admin changes to Note numbering). <i>New 60-80 Year B11 line item:</i> Like the 40-60 Year B11 item in MRP-227, Rev. 1-A, expand to the locking devices/locking welds	No	<i>Item B8 Table Note criteria in Table 4-1, MRP-227, Rev. 2:</i> Note 5 – UT inspections for cracking can indirectly look for LOFT/IE or reduction in ductility Note 8 – For inspection credit, EPRI sets minimum 75% of bolt population to be inspected by UT Note 14 – Clarifications that IASCC only applies as a mechanism for FB and internal and external BB bolt locking devices;	No need to include the new 40-80 B11 Item criteria for reference FB bolt and internal BB bolt locking devices in Table 4-1, MRP_227, Rev. 2 in the audit given that they do not need to change for or 60 year and 80 year inspection considerations for the B&W design specified bolt locking device inspections. SE/eSE to simply list (by appropriate bullet list or table) that the inspection criteria for these components are acceptable unchanged items.

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		bolts (Item 11.1 in Table 4-4 of MRP-227, Rev. 1-A).		for the CB bolts and external BB bolts		IASCC does not apply to CB bolt locking devices.	
B19 Surveillance Specimen Holder Tube (SSHT) Bolts and Bolt Locking Devices (Davis Besse [DB] Only)	No (Instead, Expansion components per Item B7.2, Table 4-4 MRP-227, Rev. 1-A)	40- 60 Year for SSHT Bolting: Expansion category UT inspections of SSHT bolts for evidence of cracking (by IASCC or fatigue) if significant cracking detected in UCB, LCB, or FD bolts Bolt locking devices: Expansion category VT-3 visual inspections of the SSHT bolt locking devices for evidence of cracking or loss of material if gross evidence of aging (damage, distortion or missing parts) is detected in Primary category UCB, LCB, or FD bolt locking devices.	Yes	New 60-80 B19 line item: The new component-specific UT criteria for the referenced SSHT bolt and VT-3 visual inspection criteria for SSHT bolt locking devices/welds (DB Only) are similar to those for 40-60 Year versions of the line items for LCB, UCB, and FD bolts and bolt locking devices in Table 4-1 of MRP-227, Rev. 1-A	No	Item B19 Table Note criteria in Table 4-1, MRP-227, Rev. 2: Note 5 – UT inspections for cracking can indirectly look for LOFT/IE or reduction in ductility Note 8 and 9 – For inspection credit, EPRI sets minimum 75% of bolt population to be inspected by UT; additional note clarifications on how the UT inspections bases relate to aging effects/mechanisms. Note 15 – Clarifies the replacement SSHT bolt compression collars and washers at Davis Besse are now considered Primary components for the mechanisms of wear, fatigue and ISR/IC. Clarifies that UT is sufficient for these mechanisms.	SSHT Bolts: No need to include the new 60-80 B19 Item criteria for SSHT bolts and bolt locking devices bolts in Table 4-1, MRP_227, Rev. 2 as part of the audit, given that EPRI MRP has elevated the inspection status of these components to Primary category status for 60 – 80 year considerations. SE/eSE to simply list (by appropriate bullet list or table) that the inspection criteria for these components are acceptable for the change in inspection category status, and the inspection basis are analogous to those for Primary UCB, LCB, and FD bolt and bolt locking device components. Again this is only applicable to the unit at Davis Besse.
B16 Core Barrel (CB) cylinder top flange circumferential weld heat affected zone (HAZ) B20 CB top flange circumferential welds regions (All B&W units)	No (Instead, Expansion components per Item B10.1, Table 4-4 MRP-227, Rev. 1-A)	Designated as inaccessible Expansion category welds in MRP-227, Rev. 1-A. If expansion is necessary by the results of VT-3 inspections of the baffle plates, justify further operation of	Yes	For 60 – 80 Year considerations: If Table 3-1 yields the welds as Primary, enhanced EVT-1 visual, eddy current testing (ET) or ultrasonic testing (UT) of the welds no later than two outages	Yes	For 60 – 80 Year considerations: Item B16 and B20 in Table 4-1 in MRP-227, Rev. 2 has these welds and weld HAZs as Primary category components. But the line item for these components in Table 3-1 of NRP-227, Rev. 2	[*** Major Audit Topic for B&W-Designed CB Assembly Components for 60 – 80 Year considerations]: Apply Oconee SLRA lessons learned to these line items. Inspection categories and accessibility issues for B&W design core barrel (CB) assembly welds will be a major audit topic for the

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		these CB welds by analysis.		from the beginning of the subsequent license renewal period, with subsequent inspections on a 10-Year augmented ISI frequency. Allows for component welds to be addressed by evaluation as an alternative to inspection is submitted to the NRC for approval..		leaves the inspection category of the CB top flange circumferential welds as either Primary or "No Additional Measures" (NAM) category – depending on whether the welds were post-weld heat treated during initial weld fabrication prior to plant operations. For the Oconee SLRA review, the staff did not accept this as a basis for placement of CB top flange circumferential welds into NAM category.	MRP-227, Rev. 2 review. This includes the EPRI MRP for B&W-design CB top flange-to-top cylinder circumferential welds. Weld accessibility considerations must be addressed. Specifically, Table 3-1 of MRP-227, Rev. 2 would allow this type of weld component to be screened out to NAM category and – this was an issue the designation of these welds in the Oconee SLRA review for those in Units 1 and 3. Not sure NAM is acceptable for B&W top flange circumferential welds. Also these were designated as not being accessible or having current acceptable EVT-1 methods in MRP-227, Rev. 1-A. So accessibility considerations also need to be addressed.. Also, as a minor topic, why are there two different line items (B16 and B20) in Table 4-1 of MRP-227, Rev. 2 for the same weld components?
B17 Core Barrel (CB) top cylinder-to-bottom cylinder center (middle) circumferential welds (All B&W units)	No (Instead, Expansion components per Item B10.1, Table 4-4 MRP-227, Rev. 1-A)	Designated as inaccessible Expansion category welds in MRP-227, Rev. 1-A. If expansion is necessary by the results of VT-3 inspections of the baffle plates, justify further operation of	Yes	Same type of basis as that for the CB top flange circumferential weld and weld HAZs in the line item above	Yes	For 60 – 80 Year considerations: For the update of Item B17, same type of basis as that for the CB top flange circumferential weld and weld HAZs in the line item above	[*** Major Audit Topic for B&W-Designed CB Assembly Components for 60 – 80 Year considerations]: Apply Oconee SLRA lessons learned to these line items. Inspection categories and accessibility issues for B&W design core barrel (CB) assembly welds will be a major audit topic for the MRP-227, Rev. 2 review. This

EPRI MRP Primary Item No. Designation And Component/Scope of Units	Included as Primary in Rev. 1-A?	Method, Frequency, and Expansion Links in Rev. 1-A / Mechanism(s) of Interest	Included as Primary in Rev. 2?	Method, Frequency, and Expansion Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
		these CB welds by analysis.					includes the EPRI MRP for B&W-design CB top flange-to-top cylinder circumferential welds. Weld accessibility considerations must be addressed Issues for the B17 CB cylinder center circumferential weld types are analogous to those cited in the previous line item on the B16/B20 CB top flange circumferential weld types.
Flow Distributor (FD) Assembly							
B12. Flow distributor (FD) bolts and bolt locking devices. (All B&W units)	Yes	UT exams of 100% of accessible bolts and VT-3 visuals of the applicable bolt locking devices during the next 10-Year ISI interval with subsequent re-inspections on a 10-year interval basis. (Bolts: For Cracking [SCC, Fatigue], (Locking Devices: Cracking [fatigue], LOM/wear) 40-60: Expand to the UTS and LTS bolt/bolt locking devices, and for DB, the SSHT bolts/bolt locking devices. Mechanisms are in previous column.	Yes – but bolts only (Bolts: For Cracking [SCC, Fatigue], See Note 9, Table 4-1, MRP-227 Rev. 2 for mechanisms listed above.	Revised 40-60 and New 60-80 B7 line items: Component-specific UT criteria for the FD bolts are identical to those for 40-60 version of B12 in Rev. 1-A (other than some admin changes to Note numbering). <u>However, VT-3 of the FD bolt lock devices eliminated in the revised 40-60 Year version of Item B8 and the new 60-80 Year version of Item B8 Table 4-1, MRP-227 Rev. 2.</u> Revised 40-60 Year Item B8: <u>FD bolts still expand to UTS, LTS and (for DB) to the SSHT bolts as well: Since the FD bolt locking devices are no longer age-</u>	Yes	Criteria for UT of the applicable FD bolts has not changed and does not need to change in Rev. 2. <u>However, tech basis for eliminating VT-3 of the FD bolt locking devices needs be audited.</u> For 60-80 Year basis; previously linked Expansion category SSHT bolts in Rev. 1-A (DB Only) are now Primary category components for Davis Besse (no need to audit this change). [NOTE: EPRI Minimum 75% population criterion needed for inspection credit by Note 6 in Table 4-1 of MRP-227, Rev. 1-A and by Note 8 in Table 4-1 of MRP-227 Rev. 2] [NOTE For Audit Efficiency: We can group the audit discussions on	[*** Highly relevant logistics issue: For LCB bolt and bolt locking device considerations, the same type of Logistics and ONS SLRA Lessons Learned Issues discussed in the B7 line item above for UCB bolt and bolt locking devices also apply to the Revised 40-60 Year Item B12 and New 60-80 Item line item B12 considerations for FD bolts in Table 4-1 of MRP-227, Rev. 2. That is: (1) EPRI is changing the 40-60 Year criteria for LCB bolts differently from that approved for the bolts in the April 25, 2019, SE for MRP-227, Rev. 1-A (which includes VT-3 inspections of the LCB bolt locking devices, and (2) UT inspections of the LCB bolts cannot distinguish evidence of cracking by fatigue from evidence of cracking initiated by SCC or IASCC] Also why isn't wear a screened-in mechanism for the FD bolts in the manner wear was

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				<p><u>managed for revised 40-60 Year basis (i.e., NAM category), no expansions to associated UTS, LTS, or SSHT bolt locking device types.</u></p> <p><i>New 60-80 Year Item B8: FD Bolts only Expand to the UTS and LTS bolts devices; no longer expand to DB SSHT bolts, and no locking devices expansions.</i></p>		<p>elimination of bolt locking device inspections for the UCB, lower core barrel (LCB), flow distributor (FD), upper thermal shield (UTS), lower thermal shield (LTS), and surveillance specimen holder tube (SSHT) bolting types as a generic audit discussion for all of those B&W design bolting types; also for UCB, LCB, and FD bolts, need to audit the revised and limited <i>expansion</i> link bases for UTS/LTS bolts based solely on detection of SCC in the UCB, LCB, of FD bolts.]</p>	<p>screened in for the UCB and LCB bolts? Fluences for the FD bolts are probably not high enough to screen in ISR/IC.</p>
Lower Grid Assembly (LGA)							
<p>B13 LGA Alloy X-750 dowel-to-guide block welds (All B&W units except DB)</p>	<p>Yes</p>	<p><i>40-60 Year Basis:</i> VT-3 visual inspections of the guide block welds for evidence of cracking (SCC) at the next 10-Year ISI interval, with subsequent inspections on a 10-year frequency.</p> <p><i>40-60: Expands to Item B13.1, Alloy X-750 dowel locking welds, and Item B13.2, LGA support pad welds in Table 4-4</i></p>	<p>Yes</p>	<p><i>40-80:</i> VT-3 visual inspections of the guide block welds for evidence of cracking (SCC) at the next 10-Year ISI interval, with subsequent inspections on a 10-year frequency.</p> <p><i>40-80: Still expands to Item B13.1, Alloy X-750 dowel locking welds, and Item B13.2, LGA support pad welds</i></p>	<p>No</p>	<p>No need to include the LGA guide block welds in the audit. Still Primary for 40 – 80 year considerations.</p>	<p>No need to include the new 40-80 B13 Item criteria for referenced LGA guide block welds in Table 4-1, MRP_227, Rev. 2 in the audit given the Primary inspection category for the welds and linked Expansion components have not changed for 80 year inspection considerations.</p> <p>SE/eSE to simply list (by appropriate bullet list or table) that the inspection criteria for these components are acceptable unchanged items.</p>
<p>B14 LGA shock pad bolts and associated locking devices (TMI units only)</p>	<p>Yes</p>	<p><i>40-60:</i> VT-3 visual inspection of the TMI LGA shock pad bolts and associated locking devices at the next 10-</p>	<p>No</p>	<p>No longer included as Primary component (Item B14) types in Table 4-1 of MRP-227, Rev. 2</p>	<p>No</p>	<p><i>40-80:</i> For 40-60, these LGA components were designated by EPRI MRP only as Primary components for Three Mile Island units. But for</p>	<p>Basis for removing Item B14 from Table 4-1 in MRP-227, Rev. 2 is acceptable given that the LGA shock pad bolts and associated locking devices only applied to TMI units. Not need</p>

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		Year ISI interval with subsequent				updated 40-80 Year bases, no need for aging management of any RVI components in the TMI units as both TMI units have decommissioned.	to include these components in the audit. SE/eSE to briefly explain the deletion of Item B14 in the SE/eSE text.
B18 Lower grid rib sections (All B&W units)	No [But listed as an Expansion component type (Item B10.3) for Primary Baffle plates (Item B10) in MRP-227, Rev. 1-A]	40-60: Per Item B10.3 in Expansion Table 4-4 and Item B10 in Table 5-1 of MRP-227, Rev. 1-A, if <i>expansion</i> to the lower grid rib sections is triggered by the results of the VT-3 inspections performed on the Primary baffle plates, perform expanded VT-3 inspections of 100% of the accessible lower grid rib sections at the next refueling outage.	Yes	60-80: This is the new Item B18 for Table 4-1 in MRP-227, Rev. 2, as the lower grid rib sections are now elevated to Primary category components for B&W design aging management programs. Perform VT-3 visual inspections of the lower grid rib sections for evidence of cracking (that may be indicative of IE) no later than two refueling outages from the start of the subsequent period of extended operation, with reinspection on a 10-Year frequency. 60-80: No linked <i>Expansion</i> category components for the lower grid rib sections.	No	The lower grid rib sections are now Primary.	For 60-80: Will explain elevation of the final inspection category (From Expansion to Primary) of the lower grid rib sections in the SE/eSE.
B18 LGA lower grid rib sections - Continued							
B21 LGA Alloy X-750 dowel-to-lower support pad welds	No [But the dowel-to-lower support pad	40-60: Per Item B13.2 in Expansion Table 4-4 and Item B13 in Table 5-1 of MRP-227, Rev. 1-A, if <i>expansion</i> to the dowel-to-lower	Yes	40-80: The LGA dowel-to-lower support pad welds are elevated from Expansion category welds to Primary	Yes	There are perceived inconsistencies between Line Item B13 criteria for Primary dowel-to-guide block welds in Table 4-1	Audit to clear up basis why 40-60 version of Item B13 (for the LGA Alloy X-750 dowel-to-guide block welds) in Table 4-1 expands to the LGA support pad welds (listed as Item

EPRI MRP Primary Item No. Designation And Component/Scope of Units	Included as Primary in Rev. 1-A?	Method, Frequency, and Expansion Links in Rev. 1-A / Mechanism(s) of Interest	Included as Primary in Rev. 2?	Method, Frequency, and Expansion Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
	welds were designated Expansion category components (Item B13.2) for the Primary dowel-to-guide block welds (Item B13)]	support pad welds is triggered by the results of the VT-3 inspections performed on the Primary dowel-to-guide block welds, perform expanded VT-3 inspections of 100% of the accessible dowel-to-lower support pad welds at the next refueling outage.		category welds per the new Item B21 in Table 4-1 of MRP-227, Rev. 2. VT-3 visual inspections of accessible surfaces in 100% of these welds during the next 10Year ISI interval with subsequent inspections on a 10-Year frequency. <i>40-80: Expands to both the Alloy X-750 dowel-to-upper grid assembly (UGA) support pad welds (Item B13.1 in Table 4-4 of MRP-227, Rev. 2) and the corresponding dowel-to-lower grid assembly (LGA) support pad welds (Item B13.2, Table 4-4 MRP-227, Rev. 2)</i>		of MRP-227, Rev. 2 and Line Item B21 for dowel-to-LGA support pad welds in Table 4-1 of MRP-227, Rev. 2.	B13.2) when apparently these welds are now listed as newly elevated Primary components for both 40 – 60 and 60 – 80 year ranges in the new Item B21 in Table 4-1 of MRP-227, Rev. 2. <i>Again, the LGA Alloy X-750 dowel-to-lower support pad welds are also listed as Expansion category components in Item B13.2 of Table 4-4, MRP-227, Rev. 2 for 40 – 80. So we have one line item in MRP-227, Rev.2 that states the LGA Alloy X-750 dowel-to-lower support pad welds are Primary welds and other lines items in the report that state the weld are Expansion category components.</i>
Incore Interfacing Components							
B15.a Incore Monitoring Instrument (IMI) guide tube spiders	Yes	<i>40-60:</i> For the IMI guide tube spider castings, VT-3 visual inspections for evidence of cracking (IE), fractured or missing parts during the next 10-year ISI interval, with subsequent inspections on a 10-Year frequency. <i>40-60: Expand to Item the LGS support pad items (Item B15.1 -</i>	Yes	<i>40-60:</i> No changes from criteria for 40-60 in MRP-227, Rev. 1-A. <i>60-80:</i> No changes to the I&E criteria for the IMI guide tube spiders in MRP-227, Rev. 1-A other than to add in the upper grid assembly (UGA) support pad items (Item B15.2 - pads, pad-to-rib section welds, Alloy X-750	No	<i>40-80:</i> For 40-80 year considerations, only change was to aid in the UGA support pad items as additional listed Expansion components for the IMI guide tube spider castings.	No need to include the IMI guide tube spider castings in the audit. SE/eSE will explain the updated 60-80 version of Item B15a as an accepted updated item that adds in the UGA support pad items as additional Expansion components for the spider castings (that in addition to the LGA support pad items as cited Expansion components).

EPRI MRP Primary Item No. Designation And Component/Scope of Units	Included as Primary in Rev. 1-A?	Method, Frequency, and Expansion Links in Rev. 1-A / Mechanism(s) of Interest	Included as Primary in Rev. 2?	Method, Frequency, and Expansion Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
		pads, pad-to-rib section welds, Alloy X-750 dowel, cap screws and associated locking welds).		dowel, cap screws and associated locking welds) as additional linked Expansion components (i.e., in addition to the LGA support pad items as linked Expansion components).			
B15.b IMI guide tube spider-to-lower grid rib section welds B15.b IMI guide tube spider-to-lower grid rib section welds – Continued	Yes	40-60: For the IMI guide tube spider-to-lower grid rib section welds, VT-3 visual inspections for evidence of cracking (IE) or separation of the welded spider arms during the next 10-year ISI interval, with subsequent inspections on a 10-Year frequency. 40-60: Welds <i>expand</i> to Item the LGS support pad items (Item B15.1 - pads, pad-to-rib section welds, Alloy X-750 dowel, cap screws and associated locking welds).	Yes	40-60: No changes from criteria for 40-60 in MRP-227, Rev. 1-A. 60-80: No changes to the I&E criteria for the spider-to-rib sections welds in MRP-227, Rev. 1-A other than to add in the upper grid assembly (UGA) support pad items (Item B15.2 - pads, pad-to-rib section welds, Alloy X-750 dowel, cap screws and associated locking welds) as additional linked Expansion components (i.e., in addition to the LGA support pad items as linked Expansion components)	No	40-80: For 40-80 year considerations, only change was to add in the UGA support pad items as additional listed Expansion components for the IMI guide tube spider-to-lower grid rib section welds.	No need to include the IMI guide tube spider-to-lower grid rib section welds in the audit. SE/eSE will explain the updated 60-80 version of Item B15b as an accepted updated item that adds in the UGA support pad items as additional Expansion components for the spider casting-to-lower grid rib section welds (that in addition to the LGA support pad items as cited Expansion components).

TABLE #B&W2 NOTES:

- The staff has screened audit needs for the specified MRP-227, Rev. 2 Table 4-1 inputs in accordance with the following color coded basis: (1) **Blue** highlighted text – specified Primary category component type does not need to be subject to an audit review for the component-specific inspection result basis; (2) **Yellow** highlighted text – specified Primary category component type is subject to a limited audit review of the component-specific inspection result basis, but only to confirm the same inspection category basis (including the Expansion component link basis) in Table 4-1 of MRP-227, Rev. 1-A can carry forward as the component-specific screening basis in Table 4-1 of MRP-227, Rev. 2; and (3) **Green** highlighted text – inspection basis (including Expansion component link basis) for the specified Primary category component type in Table 4-1 of MRP-227, Rev. 2 needs to be subject to more detailed audit discussions, included applicable item specific Note bases that apply to the component type in Table 4-1 of MRP-227, Rev. 2.

III. AUDIT TABLE #B&W3 - ASSESSED MRP-227 CHAPTER 4, TABLE 4-4 B&W COMPONENT COMPARISONS – B&W EXPANSION CATEGORY COMPONENTS INSPECTION RESULT CRITERIA REVISIONS IN REV. 2¹

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Expansion in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Expansion in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Plenum Cover (PC) Assembly Expansion Category Components							
B20.1 PC weldment rib-to-rib welds (All B&W plants)	No	N/A	Yes	60-80: If triggered by the results of the newly linked Primary core barrel (CB) assembly top flange-to-top cylinder circumferential weld (Item B20), perform EVT-1 of the rib-to-rib section welds for cracking (fatigue), with subsequent inspections performed on a 10-Year augmented ISI frequency. Alternatively, in lieu of examination, address by evaluation submitted to the NRC for approval.	Yes	60-80: The PC assembly rib-to-rib welds are only new Expansion category components linked to the core barrel assembly inspection, and not to any of the PC assembly components designated as Primary components for 60-80. 60-80: Table 3-1 in MRP-227, Rev. 2 allows the final inspection category (P, E, or NAM) category of the linked CB top flange-to-top cylinder circumferential weld to be established site-specific analysis.	A) 60-80: Need to address the Oconee SLRA lessons learned for the inspection category being applied to linked CB assembly top flange-to-top cylinder circumferential weld. The staff did not accept NAM category for these types of CB flange welds. B) 60-80: Why aren't the PC weldment rib-to-rib welds being defined as an applicable Expansion category components for any of the Primary PC/CSS component types in Items B1.a (i.e., PC weldment rib pads), B1.b (i.e., PC support flange), B1.c (i.e., PC support ring), or B1.d (i.e., CSS top flange) of Table 4-1, MRP-227 Rev. 2?
Core Support Shield (CSS) Assembly Expansion Category Components							
B20.2 CSS cylinder top flange (All B&W Plants)	No	N/A	Yes	60-80: If triggered by the results of the newly linked Primary core barrel (CB) assembly top flange-to-top cylinder circumferential weld (Item B20), perform EVT-1 of the CSS cylinder top flange for cracking (fatigue), with subsequent	Yes	Perceived inconsistency between line item B1.d for the CSS top flange in Table 4-1 of MRP-227, Rev. 2 and Item B20.2 in Table 4-4 of MRP-227, Rev. 2. 40-60: For 40-60 Year considerations, the CSC top flange was listed in Table 4-1 of MRP-227, Rev. 1-A as a Primary component with no	Audit to discuss why the CSS cylinder top flange component type for B&W-designed PWRs is listed as an Expansion category component in Item B20.2 of Table 4-4 in MRP-227, Rev. 2 when the CSS top flange is already listed as a Primary component type in Item B1.d of Table 4-1 in MRP-227, Rev. 2.

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Expansion in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Expansion in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
screws, and their locking welds) (All B&W units)				Primary incore monitoring instrument (IMI) guide tube spiders or spider-to-lower grid rib section welds (Items B15.a and B15.b in Table 4-1 of MRP-227, Rev. 2), perform VT-3 of the support pad items, with re-inspections on a 10-Year augmented ISI frequency.		B15.a and B15.b in Table 4-1 of MRP-227, Rev. 2). Longer reinspection intervals permitted for the Expansion category UGA support pad items if evaluation is submitted and approved by the NRC. 60-80: Table 3-1 in MRP-227, Rev. 2 permits the IMI guide tube spiders to be placed into the NAM category based on unit-specific analysis.	discussed with Framatome or the EPRI MRP
Vent Valve (VV) Assembly Expansion Category Components							
B2.1 VV bodies (All B&W units) B2.1 VV bodies - Continued	Yes	40-60: If triggered by the results of inspections performed on Primary CRGT spacer castings (Item B2 in Table 4-1 of MRP-227, Rev. 1-A), perform VT-3 of the cast VV bodies for cracking (TE), with subsequent inspections of the VV bodies on a 10-Year augmented ISI frequency – longer reinspection frequencies may be justified by analysis submitted and approved by the NRC.	No	N/A	Yes	60-80: VV bodies were eliminated (deleted) as specified Expansion category components for the Primary category CRGT spacer casting types in Table 4-4 of MRP-227, Rev. 2.	Oconee Nuclear Station (ONS) SLRA Lessons learned to be applied to the elimination of VV bodies (as Expansion components) for 60-80. While the staff approved elimination of VV bodies as Expansion category components for ONS Primary CRGT spacer castings during a 60-80 year time frame consideration, this basis should be touched on and briefly discussed with Framatome for the generic MRP-227, Rev. 2 review basis.
Core Barrel (CB) Assembly Expansion Category Components							
B7.1 Upper thermal shield (UTS) bolts	Yes	40-60 - bolts: UT of the bolts for evidence	Yes – but UTS bolts only	40-80 – UTS bolts: UT of the bolts for	Yes	40-80: UTS bolts still Expansion for the UCB,	Logistic Issue: The updated 40-80 Year line item B7.1 in

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Expansion in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Expansion in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
and associated bolt locking devices (All B&W units)		of cracking (SCC) on a 10 year frequency). UCB, LCB, and FD bolts are the linked Primary bolt types. <i>40-60 – bolt locking devices:</i> VT-3 visual inspections of the bolt locking devices for evidence of loss of material, damaged, distorted, or missing, locking devices (fatigue, wear, void swelling) on a 10 year frequency. The UCB, LCB, and FD bolt locking devices are the linked Primary bolt locking device types for 40-60.		evidence of cracking (SCC) on a 10 year frequency). UCB, LCB, and FD bolts remain as the linked Primary bolt types.		LCB, and FD bolting types. <i>40-80 – UTS bolt locking devices:</i> Eliminated as Expansion locking devices types in the 40-80 year line item of Item B7.1 in Table 4-4 of MRP-227, Rev. 2.	Table 4-4 of MRP-227, Rev. 2 could be interpreted as changed the 40-60 Year line item B7.1 in Table 4-4 of MRP-227, Rev. 1-A because the updated 40-80 Year line item B7.1 in Table 4-4 of MRP-227, Rev. 2 is now eliminating the UTS bolt locking devices as Expansion category locking devices for both 40-60 and 60-80 year bases. This will re-open our past 40-60 Year basis for approving Item B7.1 in Table 4-4 of MRP-227, Rev. 1-A, as evaluated in our April 25, 2019, SE for MRP-227, Rev. 1-A.
B10.1 Core barrel (CB) cylinder (including vertical and center circumferential seam welds (All B&W units)	Yes	<i>40-60:</i> Identified as inaccessible, Expansion category components linked to Primary VT-3 visual inspections performed on the CB baffle plates. If <i>expansion</i> is triggered by the results of Primary VT-3 inspections on the baffle plates, justify operability by component-specific analysis of the CB cylinder and cylinder welds or by applicable replacement activities.	No Line Item B10.1 removed from Table 4-4 of MRP-227, Rev. 2.	NA	Yes	<i>40-80:</i> Line Item B10.1 replaced with new line items for specified Primary CB weld types in new Line Items B16, B17 and B20 of Table 4-1 in MRP-227, Rev. 2. <i>60-80:</i> *** Based on Oconee SLRA lessons learned, changes are now being made to Framatome's CB assembly component-specific weld accessibility bases. That is, some CB welds (CB top-flange-to-top cylinder circumferential [girth] weld and CB top cylinder-to-bottom cylinder center/middle	See my prior comments for CB assembly welds in the applicable row entries for related line items B16, B17, and B20 in the previous audit scope table #B&W2. Oconee SLRA lesson learned to be accounted for in the updated screening, inspection category, and I&E bases for B&W-design core barrel welds. <i>60-80:</i> NOTE: For ONS units, there was a change in accessibility considerations and the linked Primary component type (i.e., for 60-80, the ONS Unit 2 CB flange girth weld and middle girth weld replaced the baffle plates as the lead, linked Primary component types).

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Expansion in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Expansion in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
						girth weld) are now claimed as being partially accessible to inspection. CB cylinder axial welds and CB bottom cylinder-to-bottom flange welds are still claimed as being inaccessible to inspection.	For each CB weld type now being claimed as being partially accessible to inspection, Framatome should establish the expected percent weld coverage that is anticipated to be achieved by inspections performed on the weld type and a minimum coverage acceptance criterion on total weld length coverage for inspection credit (i.e., in the manner we did this for Westinghouse and CE core barrel/core support barrel weld types in MRP-227-A and MRP-227, Rev. 1-A). Additionally, do we need to re-open this matter for 40-60, because for 40-60 in MRP-227, Rev. 1-A, Framatome indicated that all of the B&W CB weld types were totally inaccessible to inspection?
B10.2 Former Plates (All B&W units)	Yes	40-60: Identified as inaccessible, Expansion category components linked to Primary VT-3 visual inspections performed on the CB baffle plates. If expansion is triggered, justify operability by analysis of the former plates or by replacement.	Yes	60-80: Again, identified as inaccessible, Expansion category components linked to the Primary baffle plate inspections. If Expansion is triggered, justify operability by analysis or by component-specific repair/replacement activities.	Yes	60-80: Still inaccessible, Expansion category component type.	Limited audit only to confirm that, for design considerations, B&W design former plates remain as an Expansion component type that is totally inaccessible to inspection and that there are changes to the accessibility considerations in the manner they have changed for some of the CB weld types.
B9.1 Baffle-to-baffle bolts (BB bolts, including internal and external types) (All B&W plants)	Yes	40-60: An acceptable inspection method does not currently exist for the internal BB bolts; the external BB bolts are identified as being totally inaccessible to	Yes	40-80: Inspection bases for 40-80 of Expansion category internal BB and external BB bolts in Item B9.1 of Table 4-4, MRP-227, Rev. 2 remain that same	40-80 – Internal BB bolts: Yes	Internal BB bolt types: It has been ten years since EPRI MRP has initially claimed that acceptable inspection methods have yet to be developed and are not available for B&W-	No development of an acceptability bolt inspection technique for B&W design internal BB bolts in ten years since the EPRI's issuance of MRP-227-A in January of 2012? The EPRI MRP or Framatome

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Expansion in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Expansion in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
		inspection equipment. No examination requirements. If <i>expansion</i> to the internal and external BB bolts is triggered by results of the Primary UT inspection performed on Primary baffle-to-former bolts (FB bolts), justify by analysis or applicable replacement activities.		and carry over as those for these bolting types in Line Item B9.1 of Table 4-4 in MRP-227, Rev. 1-A (which covers 40-60 year ranges). They are also the same as those for these bolting component types in Table 4-4 of MRP-227-A (which was issued in January 2012)		design internal BB bolts. EPRI MRP does not claim the internal BB bolts are inaccessible to inspection.	should be prepared to talk to this audit topic matter.
	Yes	40-60: The CB bolts are identified as being totally inaccessible to inspection equipment. No examination requirements. If <i>expansion</i> to the CB bolts is triggered by results of the Primary UT inspection performed on Primary baffle-to-former bolts (FB bolts), justify by analysis or applicable replacement activities.	Yes	40-80: Inspection bases for 40-80 of Expansion category CB bolts in Item B9.2 of Table 4-4, MRP-227, Rev. 2 remain that same and carry over as those for these bolting types in Line Item B9.2 of Table 4-4 in MRP-227, Rev. 1-A (which covers 40-60 year ranges).	40-80 – External BB bolts: Yes	External BB bolt types: No comments	Open in audit space only for confirmation that there have been no changes to the accessibility considerations for B&W design external BB bolts (i.e., in contrast to the manner there are designated changes to the accessibility considerations for specific types of B&W-design CB weld components) – that is the external BB bolts remain inaccessible to inspection.
B9.2 Core barrel-to-former bolts (CB bolts) (All B&W units)	Yes	40-60: The CB bolts are identified as being totally inaccessible to inspection equipment. No examination requirements. If <i>expansion</i> to the CB bolts is triggered by results of the Primary UT inspection performed on Primary baffle-to-former bolts (FB bolts), justify by analysis or applicable replacement activities.	Yes	40-80: Inspection bases for 40-80 of Expansion category CB bolts in Item B9.2 of Table 4-4, MRP-227, Rev. 2 remain that same and carry over as those for these bolting types in Line Item B9.2 of Table 4-4 in MRP-227, Rev. 1-A (which covers 40-60 year ranges).	Yes	No comments	Open in audit space only for confirmation that there have been no changes to the accessibility considerations for B&W design external CB bolts (i.e., in contrast to the manner there are designated changes to the accessibility considerations for specific types of B&W-design CB weld components) – that is the CB bolts remain inaccessible to inspection.
B11.1 Locking devices/welds for external BB bolts and CB bolts (All B&W units)	Yes	40-60: The locking devices for the external BB bolts and the locking devices for the CB bolts are identified as being totally inaccessible to	Yes	40-80: Inspection bases for 40-80 of Expansion category CB bolt locking devices and external BB bolt locking devices in Item	Yes	No comments	Open in audit space only for confirmation that there have been no changes to the accessibility considerations for B&W design CB bolt locking devices and external BB bolt locking devices (i.e., in contrast

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Expansion in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Expansion in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
		inspection equipment. No examination requirements. If expansion to these types of bolt locking devices are triggered by results of the Primary VT-3 visual inspections performed on the Primary FB bolt locking devices or internal BB bolt locking devices, justify by analysis or applicable replacement activities.		B11.1 of Table 4-4, MRP-227, Rev. 2 remain that same and carry over as those for these bolt locking device types in Line Item B11.1 of Table 4-4 in MRP-227, Rev. 1-A (which covers 40-60 year ranges).			to the manner there are designated changes to the accessibility considerations for specific types of B&W-design CB weld components) – that is the CB bolt locking devices and external BB bolt locking devices remain inaccessible to inspection.
B7.2 Surveillance specimen holder tube (SSHT) bolts and associated bolt locking devices (Davis Besse [DB] Only)	Yes	40-60 – SSHT bolts for DB Only: Perform UT inspections of the SSHT bolts for evidence of cracking (induced by SCC, ISR/IC, fatigue or wear) if triggered by the results of Primary inspections performed on the Primary UCB, LCB, or FD bolts. Re-inspections of the SSHT bolts on a 10-Year ISI frequency. Longer reinspection intervals allowed if justified by analysis approved by the NRC. 40-60 – SSHT bolt locking devices for DB Only: Perform VT-3 visual inspections	Updated 40-60: Yes 60-80: No	Updated 40-60: For the updated 40-60 version of Item B7.2 in Table 4-4, MRP-227, Rev. 2, the Expansion criteria for the SSHT bolts are identical for the SSHT bolts in Item B7.2 of Table 4-4, MRP-227, Rev. 1-A; however inspection criteria for SSHT bolt locking device criteria were removed from the updated 40-60 version of Item B7.2 in Table 4-4, MRP-227, Rev. 2. 60-80: Per Item B19 in Table 4-1, MRP-227, Rev. 2, SSHT bolts for Davis Besse were	Updated 40-60: Yes 60-80: No. For 60-80 year changes, refer to Line Item B19 in the prior Audit Table #B&W2	40-60 and 60-80 (DB Only – SSHT Bolts): No real basis for removing SSHT bolt locking devices as age-managed components in MRP-227, Rev. 2. 60-80 (DB Only -SSHT Bolt Locking Devices): In Table 3-1 of MRP-227, Rev. 2 and new Line Item B19 of Table 4-1, MRP-227, Rev. 2, the SSHT bolt and bolt locking devices (DB Only) were elevated to Primary category status.	Updated 40-60: Why were the SSHT bolt locking devices removed from consideration in the updated 40-60 Line Item B7.2 in Table 4-4, MRP-227, Rev. 2 when for 60-80, they were included as age-managed Primary component locking devices in new Line Item B19, Table 4-1 of MRP-227, Rev. 2? This will re-open the staff approval basis of Item B7.2 in Table 4-4 of MRP-227, Rev. 1-A as evaluated in the staff SE of April 25, 2019, for Rev. 1-A. Refer to Line Item B19 in Audit Table #B&W2 for 60-80 SSHT bolt and bolt locking device considerations.

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Expansion in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Expansion in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
		for evidence of loss or material (wear) in the bolt locking devices or damaged, missing or distorted (fatigue, VS) of the bolt locking devices if triggered by the results of Primary inspections performed on the Primary locking devices for UCB, LCB, or FD bolt types. Re-inspections of the SSHT bolt locking devices on a 10-Year ISI frequency		elevated to Primary component status without considerations for inspections of SSHT bolt locking devices			
Lower Grid Assembly (LGA) Expansion Category Components							
B15.1 LGA support pad items (pad, pad-to-rib section welds, Alloy X-750 dowels, cap screws and their locking devices (All B&W units) B15.1 LGA support pad items - Continued	Yes	40 – 60: VT-3 visual inspection of the support pad items during each 10-year augmented ISI interval – longer intervals allowed if approved by NRC. 40 – 60: Linked Primary components are the Item B10 baffle plates in Table 4-1 of MRP-227, Rev. 1-A.	Yes	40 – 80: VT-3 visual inspections of the support pad items for evidence of cracking (IE) during each 10-year augmented ISI interval – longer intervals allowed if approved by NRC. 40 – 80: Linked Primary components are changed to the Item B15.a IMI guide tubes spiders and Item B15.b IMI guide tube spider welds in Table 4-1 of MRP-227, Rev. 2.	Yes	LGA support pad items remain as Expansion components for 40 – 80, but there is a switch in the linked Primary components for 40 – 80.	Audit to cover the basis for the switch in the linked Primary components for the 40 – 80 Basis
B10.3 LGA – lower grid rib sections (All B&W units)	Yes	40 – 60: VT-3 visual inspection of the lower grid rib sections during each 10-year augmented ISI	Yes; But 40-60 Only No: 60-80	60 – 80. Removed as Expansion components in Table 4-4 of MRP-227, Rev. 2.	No	60 – 80 Elevated to Primary components per New Item B18 in Table 4-1, MRP-227, Rev. 2.	Components stay Expansion for 4- 60. For 60 – 80, no need to audit elevation of the lower grid rib sections to Primary.

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Expansion in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Expansion in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
		interval – longer intervals allowed if approved by NRC. 40 – 60: Linked Primary components are the Item B10 baffle plates in Table 4-1 of MRP-227, Rev. 1-A.					
B13.2 Alloy X-750 dowel-to-LGA support pad welds B13.2 Alloy X-750 dowel-to- LGA support pad welds - Continued	Yes	40 – 60: VT-3 visual inspections of the accessible surfaces in 100% of the support pad welds on a once every 10-Year inspection basis (longer intervals can be used if approved by the NRC). 40 – 60: Linked Primary components are the Item B13 Alloy X-750 dowel-to-guide block welds in Table 4-1 of MRP-227, Rev. 1-A.	Yes	40 – 80: VT-3 visual inspections of the accessible surfaces in 100% of the support pad welds on a once every 10-Year inspection basis (longer intervals can be used if approved by the NRC). 40 – 80: Linked Primary components remain as the Item B13 Alloy X-750 dowel-to-guide block welds specified in Table 4-1 of MRP-227, Rev. 2.	Yes	NOTE: The screening table for B&W components in Table 3-1 of MRP-227, Rev. 2 does not include a screening-based line item for this type of LGA weld component.	Refer to the prior audit topic and basis for these types of LGA welds in Audit Table #B&W1- that is, there are no screening based line items for this category of welds in either version of Table 3-1 in MRP-227, Rev. 1-A or MRP-227, Rev. 2. Also need to briefly revisit why the specified method is a VT-3 when the normal method for detection of cracking in welds components (in Chapter 5 text in MRP-227, Rev. 1-A or Rev. 2) is an EVT-1 method. In the MRP-227 methodology, a VT-3 would only be applied to a weld component if the objective were only to look for gross indications of cracking and not any cracking that would be to be length and depth sized. NOTE: The staff would only have subjected the Expansion category Alloy X-750 dowel-to-LGA support pad welds to a limited audit review had Table 3-1 in MRP-227, Rev. 2 included the applicable screening result line item for support pad welds.

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Expansion in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Expansion in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
<p>B8.1 Lower thermal shield (LTS bolts or stud/nuts and their associated locking devices</p> <p>(ANO-1 and Davis Besse - LTS bolts and associated locking devices; Oconee units – LTS studs and nuts and associated locking devices)</p> <p>B8.1 LTS bolt/studs and associated bolt/stud locking devices - Continued</p>	<p>Yes</p>	<p>40-60 - bolts: UT of the bolts for evidence of cracking (SCC) on a 10 year frequency). UCB, LCB, and FD bolts are the linked Primary bolt types.</p> <p>40-60 – bolt locking devices: VT-3 visual inspections of the bolt locking devices for evidence of loss of material, damaged, distorted, or missing, locking devices (fatigue, wear, void swelling) on a 10 year frequency. The UCB, LCB, and FD bolt locking devices are the linked Primary bolt locking device types for 40-60.</p>	<p>Yes – but bolts or studs/nuts only</p>	<p>40 – 80 (LTS bolts or studs/nuts only): UT inspections of the bolts or studs and VT-3 inspections of the nuts on a once every 10-Year frequency (longer intervals can be used if approved by the NRC).</p> <p>40 – 80: Linked Primary components remain as the Item B7, UCB bolts, B8 LCB bolts, and Item B12 FD bolts in Table 4-1 of MRP-227, Rev. 2.</p>	<p>Yes</p>	<p>NOTE: LTS bolt/stud locking devices removed as listed Expansion category locking device types in Line Item B8.2 of Table 4-4, MRP-227, Rev. 2.</p>	<p>Logistic Issue: The updated 40-80 Year line item B8.1 in Table 4-4 of MRP-227, Rev. 2 could be interpreted as changed the 40-60 Year line item B8.1 in Table 4-4 of MRP-227, Rev. 1-A because the updated 40-80 Year line item B8.1 in Table 4-4 of MRP-227, Rev. 2 is now eliminating the LTS bolt locking devices as Expansion category locking devices for both 40-60 and 60-80 year bases. This will re-open our past 40-60 Year basis for approving Item B7.2 in Table 4-4 of MRP-227, Rev. 1-A, as evaluated in our April 25, 2019, SE for MRP-227, Rev. 1-A.</p>

TABLE #B&W3 NOTES:

- The staff has screened audit needs for the specified MRP-227, Rev. 2 Table 4-4 inputs in accordance with the following color coded basis: (1) Blue highlighted text – specified Expansion category component type does not need to be subject to an audit review for the component-specific inspection result basis in Table 4-4 of MRP-227, Rev. 2; (2) Yellow highlighted text – specified Expansion category component type is subject to a limited audit review for the inspection result basis but only to confirm the same inspection results (including the Primary component link basis) in Table 4-4 of MRP-227, Rev. 1-A can carry forward as the component-specific inspection result basis in Table 4-4 of MRP-227, Rev. 2; and (3) Green highlighted text – inspection basis (including Primary component link basis) for the specified Expansion category component type in Table 4-4 of MRP-227, Rev. 2 needs to be subject to more detailed audit discussions, included any applicable item-specific Note bases that apply to the component type in Table 4-4 of MRP-227, Rev. 2.

IV. AUDIT TABLE #B&W4 - ASSESSED MRP-227 CHAPTER 5, TABLE 5-1 B&W COMPONENT COMPARISONS – B&W PRIMARY CATEGORY COMPONENT ACCEPTANCE CRITERIA REVISIONS IN REV. 2¹

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
B1. Plenum Cover (PC) Assembly and Core Support Structure (CSS) Assembly Components a. PC weldment rib pad b. PC support flange c. PC support ring d. CSS top flange (All Units)	Yes	<p><i>40 – 60 Methods and Conditions:</i> One time physical measurement from the top of the PC rib pads and support ring to the RPV seating surface, followed by periodic VT-3 visual inspections thereafter. The relevant condition for the physical measurements is confirmation that the differential height between the top of the PC rib sections and support ring and the RPV seating surface shall average less than a 0.004 inch difference from the height in the as-built condition:</p> <p>For the VT-3s, the relevant conditions are: (a) Evidence of a general polished area in the PC support pads and support ring region and a smeared image of the RPV closure head contact region, and (b) observance of an interrupted ring in the circumferential direction on the top-side of the CSS top flange region.</p>	Yes – but amended to eliminate the physical measurement criteria	<p><i>40 – 80 Methods and Conditions:</i> Same as those for Item B1 in MRP-227, Rev. 1-A.</p> <p><i>40 – 80 Expansion Components:</i> None</p>	No	EPRI MRP is assuming that the physical measurements of the five operating B&W units were completed during the first renewed license operating period.	<p>No audit of this Table 5-1 item is necessary; EPRI MRP assumptions that the one-time physical measurements have already completed during the first renewed operating period is plausible; however, that will need to be checked as part of the audit for the incoming SLRA of a B&W-designed unit.</p> <p>It was checked for the pending Oconee SLRA review. It will be checked if Entergy applies for SLR of ANO Unit 1 or First Harbor Energy applies for SLR of Davis Besse.</p>

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
		40 – 60 Expansion Components: Non					
B2. CRGT spacer castings (All units)	Yes	<p>40 – 60 Methods and Conditions: For the VT-3 inspections of the CRGT spacer castings, the relevant condition is general evidence of fractured spacer castings, missing screws, or any other anomalies near the threaded flange region.</p> <p>40 – 60 Expansion Components: Item B2.1 vent valve (VV) bodies</p> <p>Expansion Criteria: Confirmed evidence of relevant conditions in two more CRGT spacer castings triggers expansion to the VV bodies at the next refueling outs. If triggered, the VT-3 visuals of the VV bodies looking for evidence of surface irregularities, including damaged, grossly cracked or missing parts in the VV bodies or visible damage to the jackscrews or associated VV locking devices.</p>	Yes	<p>40 – 80 Methods and Conditions: Same as those for CRGT spacer castings in Item B2 of Table 5-1 in MRP-227, Rev. 1-A.</p> <p>40 – 80 Linked Expansion Components: None.</p> <p>Prior Rev. 1-A Item B2.1 vent valve (VV) bodies are removed as Expansion category components for the CRGT spacer castings in Rev. 2 and the VV bodies are placed in the NAM category for Rev. 2.</p>	Yes	None – see next column entry.	<p>EPRI MRP to briefly discuss the basis for eliminating VV bodies as the cited Expansion category components. While the staff may be okay with that (e.g., we are approving it [elimination of VV bodies as Expansion components] for the Oconee SLRA), what about the VV jack screws and associated locking devices?</p> <p>NOTE: The criteria for the CRGT spacer castings do not need to be within the scope of the audit.</p>
B3 Vent Valve (VV) Assembly – VV top and bottom retaining rings (All units)	Yes	40 – 60 Methods and Conditions: For the VT-3 inspections of the VV top and bottom retaining rings, the relevant condition is	Yes	40 – 80 Methods and Conditions: Same as those for Item B1 in Table 5-1 of MRP-227, Rev. 1-A.	No	None	No need to audit Item B3 in Table 5-1 of MRP-227, Rev. 2.

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
B3. VV top and bottom retaining rings - Continued		evidence of damaged or fractured ring material in the flange region of the rings, missing material or that the threaded connections has failed <i>40 – 60 Expansion Components: None.</i>		<i>40 – 80 Linked Expansion Components: None.</i>			
B4. VV original locking devices (pressure plate, spring and spring retainer and U-cover) (All units)	Yes	<i>40 – 60 Methods and Conditions:</i> For the VT-3 inspections of the specified Item B4 VV original locking device types, the relevant condition looks for evidence of: (1) damage or wear in the U-cover, (2) misalignment of the pressure plate with the jack-screw, U-cover, or spring retainer, (3) damage to the pressure plate or spring retainer, or (4) jack-screw out of design configuration. Additionally, evidence that the VV is not symmetrical with the mounting ring or that the jack-screw thread extensions from the lower retaining ring threaded flange are unequal. <i>40 – 60 Linked Expansion Components: None.</i>	Yes	<i>40 – 60 Methods and Conditions:</i> Same as those defined for 40 – 60 in Item B4 of Table 5-1, MRP-227, Rev. 1-A. <i>40 – 80 Linked Expansion Components: None.</i>	No	None.	No need to audit Item B4 in Table 5-1 of MRP-227, Rev. 2.
B5. VV original locking devices (key ring and pin)	Yes	<i>40 – 60 Methods and Conditions:</i> VT-3 visuals. However, the	Yes	<i>40 – 80 Method(s):</i> VT-3 visuals	No	None.	No need to

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
(All units)		specified VV key rings and pins are inaccessible. Thus, the program looks for evidence that the VV is not symmetrical in the mounting ring or that the jack thread extensions from the lower retaining ring threaded flange are unequal. (1) 40 – 60 Expansion Components: None.		40 – 80 Relevant visual conditions for Primary type: Same as those defined for 40 – 60 in Item B5 of Table 5-1, MRP-227, Rev. 1-A. 40 – 80 Linked Expansion Components: None.			audit Item B5 in Table 5-1 of MRP-227, Rev. 2.
B6. VV modified locking devices (bolt crimped locking cups, jack-screw crimped locking devices, and bolted blocks) (ONS units only).	Yes	40 – 60 Methods and Conditions: For the VT-3 inspections of the specified Item B6 VV modified locking device types (ONS only), the relevant condition looks for evidence of: (1) fractured or missing locking cups and welds, torn crimps, or that the crimp is and sleeve slot are not aligned or bolted block is fractured or missing and (2) missing cups screws associated with the crimped locking cups or that the jack thread extensions from the lower retaining ring threaded flange are unequal. 40 – 60 Expansion Components: None.	Yes	40 – 80 Method(s): VT-3 visuals 40 – 80 Relevant visual conditions for Primary type: Same as those defined for 40 – 60 in Item B6 of Table 5-1, MRP-227, Rev. 1-A. 40 – 80 Linked Expansion Components: None.	No	None.	No need to audit Item B6 in Table 5-1 of MRP-227, Rev. 2.
B7. Core support shield (CSS) Assembly – Upper core barrel (UCB) bolts and	Yes	40 – 60 Methods and Conditions: UT inspections of the UCB bolts; VT-3 visuals of	Yes – except amended in Rev. 2 to remove the	Revised 40 - 60 and New 60 – 80 Methods and Conditions:	Yes for both Revised 40 – 60 and New 60- 80	NOTE FOR 60 - 80: For Davis Besse, the SSHT bolts and	*** Significant Logistics Issue For the Revised

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
B7. CSS Assembly – UCB bolts and bolt locking devices - Continued		<p><i>Expansion Criteria:</i> For the UT bolt inspections, confirmed unacceptable indications exceeding 10% of the UCB bolt (including previously failed or removed bolts) shall require sample <i>expansion</i> to 100% of the corresponding UTS and LTS bolts (and additionally for Davis Besse, the SSHT bolts) within the next unit refueling outage.</p> <p>For the VT-3 bolt locking device inspections, confirmed unacceptable indications exceeding 10% of the UCB bolt locking devices (including those for previously failed or removed bolts) shall require sample <i>expansion</i> to 100% of the corresponding UTS and LTS bolt locking devices (and additionally for Davis Besse, the SSHT bolt locking devices) within the next unit refueling outage. Inspection methods for the Expansion types are the same as those for the specified Primary UCB bolt and bolt locking devices.</p>					<p>NOTE; This will be the same audit issue for line items on Item B8 for the Lower Core Barrel (LCB) Bolts and Bolt Locking Devices and Item B12 for the Flow Distributor (FD) Bolt and Bolt Locking Devices that follow in this table.</p>

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
B8 Core Barrel (CB) Assembly – Lower core barrel (LCB) bolts and bolt locking devices (All units)	Yes	<p><i>40 – 60 Methods and Conditions:</i> Methods and acceptance criteria are analogous to those of UCB bolts in Item B7 of this table. Refer to the corresponding column entry for the UCB bolts and bolt locking devices in the line item for item B7, which also applies to the LCB bolts and bolt locking devices for Item B8.</p> <p><i>40 -60 Expansion Components and Expansion Criteria:</i></p> <p>Again, similar to the UCB types, the Expansion component types for the LCB bolts and bolt locking devices are the Item B.7.1 UTS bolt and bolt locking devices, the Item B8.1 LTS bolts/studs and nuts and associated bolt/stud locking devices, and for 40 – 60 of Davis Besse, the Item B7.2 surveillance specimen holder tube (SSHT) bolts and bolt locking devices.</p>	Yes – Except amended in Rev. 2 to remove the specified bolt locking devices for Primary LCB bolts, and the locking devices for Expansion category LTS, and UTS bolts as Expansion category locking device components. See comment on changes to SSHT bolts and bolt locking devices	<p><i>Revised 40 - 60 and New 60 – 80 Methods and Conditions, Expansion Component, and Expansion Criteria:</i></p> <p>Analogous to those for the UCB bolts and bolt locking devices in the analogous column entry for the line item on Item B7 of this table. Refer to the corresponding column entry for the UCB bolts and bolt locking devices in the line item for item B7, which also applies to the LCB bolts and bolt locking devices for Item B8.</p> <p>Refer to analogous column entry statement in the line item for Item B7 regarding removal of LTS and UTS bolt locking devices for the Revised 40 – 60 Year basis and the new 60 – 80 year basis.</p>	Yes for both Revised 40 – 60 and New 60- 80 versions of Item B8 in Table 5-1 of MRP-227, Rev. 2	NOTE FOR 60 - 80: For Davis Besse, the SSHT bolts and bolt locking devices are elevated to Primary components per Item B19 in Tables 4-1 and 5-1 of MRP-227, Rev. 2.	[*** Significant Logistics Issue For the Revised 40 – 60 Item B7 in Table 5-1, MRP-227, Rev. 2]: Refer to the analogous column entry statements for the line item B.7 on UCB bolts and bolt locking devices, which also applies to the LCB bolts and bolt locking devices.
B9. Core Barrel (CB) Assembly – Baffle-to-Former (FB) bolts	Yes	<p><i>40 – 60 Methods and Conditions:</i> Volumetric (UT) of 100% of all accessible FB bolts</p>	Yes	<p><i>Revised 40 - 60 and New 60 – 80 Methods and Conditions, Expansion</i></p>		External BB bolts and CB-F bolts are inaccessible to	Technical audit topic: After 14 years since MRP-227, Rev 0 was

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
<p>B10. Core Barrel (CB) Assembly – Baffle plates (All units)</p> <p>B10. Core Barrel (CB) Assembly – Baffle plates - Continued</p>	<p>Yes</p>	<p><i>40 – 60 Methods and Conditions:</i> Visual VT-3 inspections of the baffle plates to look for readily detectable cracking</p> <p><i>40 – 60 Expansion Components:</i> Expands to: (a) Item B10.1, CB cylinder and vertical and circumferential seam welds, (b) Item B10.2 CB former plates, and (c) LGA lower grid rib sections.</p> <p><i>Expansion Criteria:</i> Confirmed cracking of the baffle plate within one inch of a bolt or flow hole location shall require sample expansion as follows:</p> <p>A. The CB welds and former plates are inaccessible. If expansion to the former plates and CB welds is triggered by VT-3s on the baffle plates, justify by component-specific analysis or evaluation CB former plates and welds or by component-specific repair or replacement activities.</p> <p>B. The LGA lower grid rib sections are at least partially accessible to</p>	<p>Yes</p> <p>But with changes to the referenced Expansion category component types for the Revised 40 – 60 basis and the new 60 – 80 year basis for Item B10 baffle plates in Table 5-1 of MRP-227, Rev. 2.</p>	<p><i>Updated 40 – 60 and New 60 – 80 Methods and Conditions:</i> Same as those for Item B10 baffle plates in Table 5-1 of MRP-227, Rev. 1-A (VT-3 for gross detection of cracking once every 10 Years)</p> <p><i>Updated 40 – 60 Expansion Component and Expansion Criteria:</i> When expansion is triggered, revised only to expand to the Item B10.3 LGA lower grid rib sections - looking for a readily detectable crack indications by VT-3 inspection of the accessible rib section HAZs adjacent to the IMI Guide tube spider welds. For updated 40 – 60, no longer expands to the CB welds or former plates.</p> <p><i>New 60 – 80 Expansion Component Type and Expansion Criteria:</i> Revised to expand only to the Item B10.1 former plates. If expansion is triggered by confirmation of gross cracking in the areas of a baffle plate in proximity of a bolt or flow/slot hole location, justify operability of the CB assembly and former plates in the assembly by components specific analysis or repair or replacement schedule.</p>	<p>Yes – for updated/revised 40 -60</p> <p>No – for new 60 – 80</p>	<p>Again, revised Expansion criteria are proposed in the Revised 40 – 60 B10 and the new 60 – 80 B10 Items of Table 5-1, MRP-227, Rev. 2.</p>	<p>Technical Logistics Issue Updated 40 – 60 Item B10 in Table 5-1 of MRP-227, Rev. 2: For the updated 40 – 60 basis in Item B10 of Table 5-1, MRP-227, Rev. 2, the change to the designated Expansion category components represents a logistics issue for the prior 40 – 60 Expansion links approved for Item B10 in Table 5-1 of MRP-227, Rev. 1-A, as previously approved in our April 25, 2019 SE for MRP-227, Rev. 1-A.</p> <p>For new 60 – 80 in Item B10 of Table 5-1, MRP-227, Rev. 2, the change to the Expansion components is acceptable because: (1) the LGA lower grid rib sections are now primary, and (2) the staff will be working out the prior inspection categories for the</p>

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
		inspection. When triggered by the results of VT-3s on the baffle plates, complete inspections of 100% of the accessible lower grid rib section heat affected zones adjacent to the IMI guide tube spider-to-lower grid rib section welds within the next refueling outage for the unit. Looking for evidence of readily detectable cracking in the rib sections.		submitted to the NRC within one year of			various CB welds per lessons learned from the ONS SLRA review.
B11. Core Barrel (CB) Assembly – Locking devices of baffle-to-former (FB) bolts and of internal baffle-to-baffle (BB) bolts (All units) B11. Core Barrel (CB) Assembly – Locking devices of FB bolts and	Yes	<i>40 – 60 Methods and Conditions:</i> The visual VT-3 inspections for the specified locking device types look for evidence of broken, separated, or missing bolt locking devices or welds. <i>40 – 60 Expansion Components:</i> Expands to the Item B11.1 locking devices (including locking welds of the external baffle-to-baffle (BB) bolt and locking devices (including locking welds) of the core barrel-to-former bolts. <i>Expansion criteria:</i> Confirmed relevant age-related degradation considers in more than 1% of the BF bolt locking devices and	Yes	<i>Updated 40 – 80 Methods, Conditions, Expansion Components, and Expansion Criteria:</i> Same as the criteria for Item B11 of MRP-227, Rev. 1-A for 40 – 60.	No	No comments.	No need to audit the 40 – 80 criteria in Item B11 of Table 5-1, MRP-227, Rev. 2.

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
internal BB bolts - Continued		internal BB bolt locking devices calls for expansion to the specified external BB bolt and CB-F bolt locking devices. However, an inspection method is not yet available for the external BB bolt locking devices and the CB-F bolt locking devices are inaccessible to inspection. If expansion to these Expansion category locking device types is triggered by the results VT-3 inspections performed on either the Primary FB bolt locking devices or internal BB bolt locking devices, justify by evaluation or repair/replacement activities submitted to the NRC within one refueling outage of outage in which the indications were detected in the Primary locking device type.					
B19. Core Barrel (CB) Assembly – Surveillance specimen holder tube bolts and bolt locking devices (Davis Besse only) B19. Core Barrel (CB) Assembly – Davis Besse SSHT bolts and bolt locking	No	NA – No Item B19 in Table 5-1 of MRP-227, Rev. 1-A, as the SSHT bolts and bolt locking devices are Expansion category components in the MRP-227, Rev. 1-A methodology.	Yes	<i>New 60 – 80 Methods, Conditions, Expansion Components, and Expansion Criteria for Davis Besse only:</i> Davis Besse SSHT bolts and bolt locking devices elevated from Expansion to Primary components in Item B19 of Table 5-1, MRP-227, Rev. 2, without	Yes	No pertinent comments.	Audit only to find out why EPRI MPR did not define acceptance criteria for the UTs performed on the SSHT bolts and the VT-3s on the SSHT bolt locking devices. But this is a Davis Besse only item – so the EPRI MRP may just be

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
devices – Continued				<p>designated Expansion category components.</p> <p>New inspections methods are analogous to those for Primary category UCB, LCB, and FD bolts and bolt locking devices (UT of the of the bolts and VT-3 of the bolt locking devices. The new Item B19 however, does not establish the acceptance criteria for these bolt and bolt locking device inspections.</p> <p>There are no Expansion category components for the elevated Primary category SSHT bolts and bolt locking devices at Davis Besse.</p>			relying on the licensee for Davis Bessel to establish this on an owner-specific basis.
<p>B16. Core Barrel (CB) Assembly – CB top cylinder-to-top flange circumferential weld HAZ</p> <p>(All units)</p> <p>B16. CB top cylinder-to-top flange circumferential</p>	No	<p>40 – 60 Methods and Conditions: NA</p> <p>NOTE: CB cylinders and weld types in B&W units were Expansion category welds in TMRP-227, Rev. 1-A per Item B10.1 in Table 4-4 of the report – See the Item B10.1 audit line item entry for the CB cylinder components in Table #B&W3</p>	Yes	<p><i>New 40 – 80 Methods, Conditions, Expansion Components, and Expansion Criteria:</i></p> <p>Enhanced EVT-1 visual inspection, eddy current (ECT) inspection, or volumetric UT inspection of the CB top cylinder-to-top flange circumferential weld. The inspection relevant condition is a detectable cracklike surface condition.</p> <p>No cited Expansion CB weld component types for Item B16 Primary weld type (CB to cylinder-to-top flange circumferential weld).</p>	Yes	<p>New 40 – 80 basis reopens our past 40 – 60 year basis approved in our April 25, 2019, SE for MRP-227, Rev. 1-A for same weld components - that is our past approval of Item B10.1 of Table 4-4, MRP-227, Rev. 1-A.</p> <p>NAM category for CB weld types is probably not acceptable to the staff. Thus</p>	<p>B&W CB assembly components will be subject to a special audit topic.</p> <p>Again possible logistics issue for new 40 – 80 Item B16 in Rev. 2.</p> <p>Additionally, the corresponding MRP-227, Rev. 2 Table 3-1 entry for this weld type would allow this CB weld type to be dispositioned to NAM category by unit-specific analysis. But given Framatome's</p>

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
weld HAZ - Continued B16. CB top cylinder-to-top flange circumferential						why no Expansion CB welds types for cited Item B16 and B17 Primary CB weld types? This also appears to be a redundant new line item for new Line Item B20 in Table 5-1 of MRP-227, Rev. 2, which does include Expansion component types. If Primary, will they be inspecting all accessible portions the entire weld or just the HAZ? Component accessibility criteria need to be established for all CB weld types – including establishment of a lower bound total weld coverage criteria for inspection credit of the weld type. The stated relevant cracklike surface	safety-related intended function definition for the B&W-design CB assemblies, placing the CB assemblies and welds in the NAM category of a PWR Vessel Internals Program may not be acceptable to the staff! See prior comments for B&W-design CB weld types for Audit Table Nos. B&W1, B&W2, and B&W3. Per Oconee SLRA lessons learned, CB top cylinder and bottom cylinder vertical weld types of CB bottom cylinder-to-bottom flange circumferential weld types should be identified as Expansion category components for designated Primary CB weld types in the B16, B17, and B20 items.

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
weld HAZ - Continued						5-1 in MRP-227, Rev. 2	
B17. Core Barrel (CB) Assembly – CB top cylinder-to-bottom cylinder center circumferential weld (See Note 5 in Table 5-1, MRP-227, Rev. 2 for 60-80 unit applicability)	No	40 – 60 Methods and Conditions: NA NOTE: CB cylinders and weld types in B&W units were Expansion category welds in TMRP-227, Rev. 1-A per Item B10.1 in Table 4-4 of the report – See the Item B10.1 audit line item entry for the CB cylinder components in Table #B&W3	Yes	New 40 – 80 Methods, Conditions, Expansion Components, and Expansion Criteria: Enhanced EVT-1 visual inspection, eddy current (ECT) inspection, or volumetric UT inspection of the CB top cylinder-to-bottom cylinder center circumferential weld. The inspection relevant condition is a detectable cracklike surface condition. No cited Expansion CB weld component types for Item B17 Primary weld type (i.e. CB top cylinder-to-bottom cylinder center circumferential weld).	Yes	See corresponding column entry comments for the previous Item B16 components (CB cylinder top flange circ weld) which also apply here to the Item B17 CB weld type (i.e., center circ weld)	B&W CB assembly components will be subject to a special audit topic. No logistics issue here because Item B17 is a new 60 – 80 year item. But other audit basis statements for the item B16 CB top flange circ weld type also apply to the Item B17 CB center circ weld type. See previous comment for Item B16 above.
B20. Core Barrel (CB) Assembly – CB top cylinder-to-top flange circumferential weld region (All units -see Note 6 in Table 5-1, MRP-227, Rev. 2)	No	40 – 60 Methods and Conditions: NA NOTE: CB cylinders and weld types in B&W units were Expansion category welds in TMRP-227, Rev. 1-A per Item B10.1 in Table 4-4 of the report – See the Item B10.1 audit line item entry for the CB cylinder components in Table #B&W3	Yes	New 60 – 80 Methods and Conditions: Enhanced EVT-1 visual inspection, eddy current (ECT) inspection, or volumetric UT inspection of the CB top cylinder-to-bottom cylinder center circumferential weld. The inspection relevant condition is a detectable cracklike surface condition. New 60 – 80 Expansion Components: When triggered, expands to Item B20.1, PC weldment rib-to-	Yes	See corresponding column entry comments for the previous Item B16 components (CB cylinder top flange circ weld) which also apply here to the Item B20 CB weld type. Also, why is Item B20 necessary for 60 – 80 in Table 5-1 of	B&W design CB weld inspection categories will be a special audit topic. No logistics issue here because Item B20 is a new 60 – 80 year item. But other audit basis statements for the item B16 CB top flange circ weld type also apply to the Item B20 CB weld type. See previous comments and audit topics for

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
				<p>rib welds, and Item B20.2 CSS cylinder top flange.</p> <p><i>New 60 – 80 Expansion Criteria:</i> Confirmed evidence of relevant conditions at one or more locations triggers expansion to the Item B20.1, PC weldment rib-to-rib welds, and Item B20.2 CSS cylinder top flange. Inspections of the cited Expansion component look for similar conditions of detectable cracklike conditions..</p>		<p>MRP-227, Rev. 2 when Item B16 above covers the same CB weld type for 40 – 80? And why is the new Item B20 expanding the PC rib-to-rib welds and CSS top flange but not to the CB top cylinder and bottom cylinder axial welds or CB bottom cylinder-to-bottom flange weld?</p>	<p>Item B16 above, which applies to Item B20 as well.</p> <p>Also, why is Item B20 necessary for 60 – 80 in Table 5-1 of MRP-227, Rev. 2 when Item B16 above covers the same CB weld type for 40 – 80 (i.e., the CB top flange weld)?</p>
<p>B13. Lower Grid Assembly – Alloy X-750 dowel-to-guide block weld</p> <p>(All units except Davis Besse)</p> <p>B13. Lower Grid Assembly – Alloy X-750 dowel-to-guide block weld - Continued</p>	<p>Yes</p>	<p><i>40 – 60 Methods and Conditions:</i> VT-3 visuals for separated or missing locking welds from the dowels or missing dowels. Note 4 in the Item B13 allowed the basis of the guide block welds at Davis Besse to be done by alternate unit-specific basis.</p> <p><i>40 – 60 Expansion Components:</i> Expands to the Item B13.1 Alloy X-750 dowel-to-UGA support pad welds and Item B13.2 1 Alloy X-750 dowel-to-LGA support pad welds.</p> <p><i>Expansion Criteria:</i> Confirmed evidence of the separated or missing component</p>	<p>Yes</p>	<p><i>Updated 40 – 80 Methods and Conditions:</i> Identical to those for 40 – 60 in Item B13 of Table 5-1, MRP-227, Rev. 1-A.</p> <p><i>40 – 80 Expansion Components:</i> Expands to the Item B13.1 Alloy X-750 dowel-to-UGA support pad welds.</p> <p><i>Expansion Criteria:</i> Confirmed evidence of the separated or missing component conditions in two or more of component locations will trigger expansion to the B13.1 component weld type, with the expanded VT-3 of the Expansion welds to be performed within the next refueling outage of the unit. The relevant conditions for</p>	<p>Yes</p>	<p>Is Note 4 for Davis Besse replaced and now covered by the new Item B21 for the Alloy X-750 dowel-to-LGA support pad welds in Table 5-1 of MRP-227, Rev. 2?</p>	<p>Limited audit only to confirm: (1) whether Davis Besse has the specified guide block weld type, or else (2) whether Note 4 was covered and replaced in Rev. 2 by elevating the Alloy X-750 dowel-to LGA support pad welds at Davis Besse from Expansion to Primary category welds. If it is the latter case, confirm that the Alloy X-750 dowel-to LGA support pad welds in the three ONS units and the</p>

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
		conditions in two or more of component locations will trigger expansion to the B13.1 and B13.2 component weld types, with the expanded VT-3 of the Expansion welds to be performed within the next refueling outage of the unit. The relevant conditions for the Expansion type welds are analogous to those for the B13 Primary type..		the Expansion type welds are analogous to those for the B13 Primary type.			ANO-1 unit remain as one of the two Expansion category weld types for the associated guide block welds in those reactor units. Otherwise no question for the updated B13 item in Table 5-1 of MRP-227, Rev. 2.
B21. Lower Grid Assembly (LGA) – Alloy X-750 dowel-to-LGA support pad welds (Davis Besse only) B21. Lower Grid Assembly (LGA) – Alloy X-750 dowel-to-LGA support pad welds - Continued	No	NA	Yes	<i>New 40 – 80 Methods and Conditions:</i> VT-3 visuals for separated or missing locking welds from the dowels or missing dowels. <i>New 40 – 80 Expansion Components:</i> Expands to the Item B13.1 Alloy X-750 dowel-to-UGA support pad welds. <i>Expansion Criteria:</i> For Davis Besse, confirmed evidence of the separated or missing component conditions in two or more of component locations will trigger expansion to the B13.1 component weld types, with the expanded VT-3 of the Expansion welds to be performed within the next refueling outage of the unit. The relevant conditions for the Expansion type welds are	Yes	I think the Davis Besse situation in MRP-227, Rev. 1-A was covered by Note 4 in Item B13 of Table 5-1, MRP-227, Rev. 1-A. See above row line item basis. For Davis Besse unit, these Alloy X-750 dowel-to-LGA support pad welds are being elevated from Expansion welds to Primary category welds in Rev. 2.	See limited audit topic questions for the Item B13 line item immediately above. Otherwise, no questions?

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
				analogous to those for the B13 Primary type..			
B18. Lower Grid Assembly (LGA) – Lower grid rib sections (All units)	No	NA – Item B18 not included in Table 5-1 of Rev. 1-A Instead, the LGA lower grid rib sections were Expansion category base metal components in MRP-227, Rev. 1-A under Item B10.3 of Table 4-4 in Rev. 1-A (with the linked Primary components being the Item B10 baffle plates).	Yes The LGA lower grid rib sections are elevated to Primary category components in Rev. 2	<i>New 40 – 80 Methods and Conditions:</i> VT-3 visuals look for readily detectable evidence of cracking in the lower grid rib sections. <i>New 40 – 80 Expansion Components:</i> None.	No	None	No reason to audit the elevation of the lower grid rib sections into the Primary category of the program.
B12. Flow Distributor (FD) Assembly – FD bolt and bolt locking devices (All units)	Yes	<i>40 – 60 Methods and Conditions:</i> Methods and acceptance criteria are analogous to those of UCB bolts in Item B7 of this table. Refer to the corresponding column entry for the UCB bolts and bolt locking devices in the line item for item B7, which also applies to the FD bolts and bolt locking devices for Item B12. <i>40 -60 Expansion Components and Expansion Criteria:</i> Again, similar to the UCB types, the Expansion component types for the FD bolts and bolt locking devices are the Item B.7.1 UTS bolt and bolt locking devices, the Item B8.1 LTS bolts/studs and	Yes – Except amended in Rev. 2 to remove the specified bolt locking devices for Primary FD bolts, and the locking devices for Expansion category LTS, and UTS bolts as Expansion category locking device components. See comment on changes to SSHT bolts and bolt	<i>Revised 40 - 60 and New 60 – 80 Methods and Conditions, Expansion Component, and Expansion Criteria:</i> Analogous to those for the UCB bolts and bolt locking devices in the analogous column entry for the line item on Item B7 of this table. Refer to the corresponding column entry for the UCB bolts and bolt locking devices in the line item for item B7, which also applies to the FD bolts and bolt locking devices for Item B12. Refer to analogous column entry statement in the line item for Item B7 regarding removal of LTS and UTS bolt locking devices for the Revised 40 – 60 Year basis and the new 60 – 80 year basis.	Yes for both Revised 40 – 60 and New 60- 80 versions of Item B8 in Table 5-1 of MRP-227, Rev. 2	NOTE FOR 60 - 80: For Davis Besse, the SSHT bolts and bolt locking devices are elevated to Primary components per Item B19 in Tables 4-1 and 5-1 of MRP-227, Rev. 2.	[*** Significant Logistics Issue For the Revised 40 – 60 Item B7 in Table 5-1, MRP-227, Rev. 2]: Refer to the analogous column entry statements for the line item B.7 on UCB bolts and bolt locking devices, which also applies to the FD bolts and bolt locking devices.

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
		nuts and associated bolt/stud locking devices, and for 40 – 60 of Davis Besse, the Item B7.2 surveillance specimen holder tube (SSHT) bolts and bolt locking devices.	locking devices				
<p>B15a. Incore Monitoring Instrumentation (IMI) Guide Tube Assembly – IMI guide tube spiders</p> <p>B15.b. IMI guide tube spider-to-lower grid rib section welds.</p> <p>(All units)</p> <p>Item B15a IMI guide tube spiders – Continued /</p>	Yes	<p><i>40 – 60 Methods and Conditions:</i> For specified spider base metal components, the VT-3 visuals look for fractured or missing spider arms or a spider arm that does not align with the LGA support pad screw (as viewed from the top).</p> <p>For the specified spider welds, the VT-3 visuals look for separated or missing welds.</p> <p><i>40 – 60 Expansion Components:</i> Expands to the Item B15.1 LGA support pad items, as defined in Item B15.1 of Table 4-4, MRP-227, Rev. 1-A</p> <p><i>Expansion Criteria:</i> Confirmed evidence of relevant conditions at two or more spider locations will trigger VT-3 inspections of accessible surfaces of 100% of the LGA support pads, and support pad dowels and cap screws at the next</p>	Yes – but with additional Expansion category components for 60 - 80	<p><i>Restated 40 – 60 Methods and Conditions, Expansion Components and Expansion Criteria:</i> Identical to those for 40 – 60 in Items B15a and B15b of Table 5-1, MRP-227, Rev. 1-A.</p> <p><i>New 60 – 80 Methods and Conditions for Primary Types:</i> Same as those for the IMI spiders and IMI spider welds in Items B15a and B15b of Table 5-1, MRP-227, Rev. 1-A</p> <p><i>Updated 60 – 80 Expansion Components:</i> (a) Maintains the B15.1 LGA support pad items as main Expansion category component types for the IMI spiders and spider welds, and (b) adds in Item B15.2 UGA support pads items as new secondary Expansion components types.</p> <p>Expansion Criteria: For the LGA support pad items as main Expansion component types, the Expansion criteria are the same as those defined in</p>	<p>Yes – for the IMI spiders</p> <p>No – for the IMI spider welds</p>	Table 3-1 would allow the CASS IMI guide tube spiders to be placed in the NAM category by unit-specific analysis.	Components (e.g., like the IMI guide tube spiders) with variable inspection category bases in Table 3-1 of MRP-227, Rev. 2 need to be technically assessed by the staff and discussed with the EPRI MRP and Framatome. That is a shift in the screening protocol (and methodology) for Rev. 2 that was never included in the corresponding Table 3-1 of the prior reports (MRP-227-A and MRP-227, Rev. 1-A).

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
Item B15b IMI spiders and spider welds - Continued		refueling outage. Relevant conditions for VT-3s of the support pad components are separated or missing welds, missing support pads, dowels, cap screws and locking welds, or misalignment of the support pads.		Item B15a/B15b line item in Table 5-1, MRP-227, Rev. 1-A. For the secondary Expansion category UGA supports pad items, adds in that: Confirmed relevant conditions detected in the accessible surfaces of two more accessible LGA support pads, dowels, cap screws, or welds (main Expansion types) shall trigger VT-3s of accessible surfaces in the corresponding UGA support pad components (for 100% of the UGA support pads) at the next refueling outage. Relevant conditions in the UGA support pad components are analogous to those for the LGA support pad components.			

TABLE #B&W4 NOTES:

- The staff has screened audit needs for the specified MRP-227, Rev. 2 Table 5-1 inputs in accordance with the following color coded basis: (1) **Blue** highlighted text – specified acceptance criteria basis for specified Primary and Expansion category component types in Table 5-1 of the MRP-227 Rev. 1-A or Rev. 2 versions does not need to be subject to an audit review for the component-specific basis in Table 5-1 of MRP-227, Rev. 2; (2) **Yellow** highlighted text – specified acceptance criteria basis for specified Primary and Expansion category component types in Table 5-1 of the MRP-227 Rev. 1-A or Rev. 2 versions is subject to a limited audit review for the inspection result basis but only to confirm the same inspection criteria for the specified Primary and Expansion components types can carry forward as the acceptance criteria basis in Table 5-1 of MRP-227, Rev. 2; and (3) **Green** highlighted text – the specified acceptance criteria basis for specified Primary and Expansion category component types in Table 5-1 of MRP-227, Rev. 2 needs to be subject to more detailed audit discussions, included any applicable item-specific Note bases that apply to the component type in Table 5-1 of MRP-227, Rev. 2.
- Table B&W4 does not need to include a line item corresponding to current Item B14, “Lower Grid Assembly, Shock pad bolts and their locking devices,” of Table 5-1, MRP-227, Rev. 1-A because the B14 item only applies to the Three Mile Island (TMI) Unit 1 plant. Both of the TMI units have decommissioned.

ENCLOSURE 4

COMBUSTION ENGINEERING DESIGN-SPECIFIC AUDIT TOPICS

FOR TABLES 3-2, 4-2, 4-5, 4-8, AND 5-2 IN MRP-227, REV. 2

The component-specific line items in the tabular audit discussion tables in this enclosure are color coded as follows in order to convey whether the component-specific topics warrant audit discussions, and if so, the degree of audit discussions that are merited on the component-specific audit topic: (1) **blue** color highlighted content conveys the component-specific topic does not need to be included in audit discussions, (2) **yellow** color highlighted content conveys the component-specific topic warrants some limited audit discussion, and (3) **green** color highlighted content conveys the component-specific topic warrants more detailed audit discussions.

I. AUDIT TABLE #CE1 - ASSESSED MRP-227 CHAPTER 3, TABLE 3-2 CE COMPONENT COMPARISONS – CE COMPONENTS SUBJECT TO AUDIT FOR SCREENING RESULTS

Assembly/Component Description ³	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Upper Internals Assembly (UIA)							
Fuel Alignment Plate	Yes	P	Yes	P or E	No	See Audit Topic column entry	No questions of the version of the line item for the fuel alignment plate in Table 3-2 of Rev. 2; but there will be confirmatory limited audit questions of the Item C10 entry for the component in Tables 4-2 and 5-2 of the report and the Item C6.4 entry for the fuel alignment plate in Table 4-5 of the report. See limited audit topics to the Item C10 line items in Audit Table Nos. CE2 and CE5 and the audit topics for Item C6.4 in Audit Table No. CE3.
Lower Support Structure (LSS)							
Core support plate	Yes	P in Table 3-2 of Rev. 1-A, but P or NAM per Item C9 in Table 4-2 of MRP-227, Rev. 1-A	Yes	P	Yes	No comments.	Table 3-2 in Rev. 2 identifies the LSS core support plate remain as a Primary component for Rev. 2. However, the assessment in Chapter 4 of the report places the LSS core support plate into either the Primary category (Table 4-1 / Table 5-1 Item C9 criteria) or the Expansion category (per Table 4-5, Item C6.3 criteria) – as dependent on the result of plant-specific 80-year fatigue screening assessment for the core support plate. So why isn't the final inspection category column entry for the core support plate in Table 3-2 of Rev. 2 listed as "P or E"?
Fuel alignment pins	Yes (for CE units with welded, full height shroud plates)	X	Yes	X	No	No comments.	The LSS fuel alignment pins remain as an Existing Program components for Rev. 2 (i.e., linked to ASME Section XI inspection requirements). No audit of this line item in Table 3-2 is necessary.
Core support columns (for columns made from with CASS or Wrought 304 SS)	Yes	E	Yes	E	No	No comments.	The LSS core support columns remain as Expansion components for Rev. 2 regardless of the material of fabrication. No audit of this line item in Table 3-2 is necessary.
Core support column bolts (for CE units with welded core shroud designs made from full height shroud plates)	Yes	E	No	NA	Yes	Is this Rev. 1-A column entry for the core support column bolts only applicable to CE units with bolted core shroud designs (i.e., Ft. Calhoun and Palisades units)?	Audit to confirm whether the removal of the line item for core support column bolts in Table 3-2 of Rev. 2 was based on the decommissioning of the Palisades and Ft. Calhoun units? Otherwise EPRI MRP needs to explain removal of a line item for the core

Assembly/Component Description ³	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Core support column bolts – Continued.							support column bolts from the scope of Table 3-2 in MRP-227, Rev. 2.
Lower core support beams (CE units design other than those with welded core shrouds made from full height shroud plates)	Yes	E	Yes	E	Yes	See Audit Topic column entry	Limited audit only to briefly discuss why lower support beams in the units with the deep beams are Primary components where those with the smaller sized beams are Expansion components.
Lower core support deep beams (for CE units with welded core shrouds made from full height shroud plates)	Yes	P	Yes	P	Yes	See Audit Topic column entry	Limited audit only to briefly discuss why lower support beams in the units with the deep beams are Primary components where those with the smaller sized beams are Expansion components.
Control Element Assembly (CEA)							
CEA instrument tubes and supports	Yes	P	Yes	P or E	Yes	See Audit Topic column entry	Audit needs to clear up why P in Table 3-2 of Rev. 1-A but now either P or E in Table 3-2 of Rev. 2 (using additional line item Note). There should be separate items in Table 3-2 of Rev. 2 for: (1) the peripheral CEA instrument guide tubes, which are "P" and (2) the non-peripheral (remaining) CEA instrument guide tubes, which are "E". We are talking about different criteria for CEA instrument guide tubes based on the radial location from the center of the reactor core.
CEA shroud bolts	No	NA	Yes	P	Yes	<p>This is a new Table 3-2 Primary component type in Rev. 2. Staff has not issue with the Primary categorization of the bolting type component.</p> <p>New screening-based line item for the component type for Table 3-2 (and Table 4-8) of MRP-227, Rev. 2. MRP 2018-01 provides the basis for the changes. No issue with this.</p> <p>However, this referenced component type was never assessed for screening in a corresponding line item in Table 3-2 of MRP-227, Rev. 1-A. Thus, this fails into the scope of a generic logistics issue on the review of changes being made</p>	Staff has no issue with adding in new Primary component types. But EPRI MRP needs to clarify which type of CE units correlate to the new Primary categorization item of the CEA shroud bolts. Additionally, the generic logistics issue why the CEA shroud bolts were not assessed for screening in Table 3-2 of MRP-227, Rev. 1-A needs to be addressed; see the Note 3 clarification in this table.

Assembly/Component Description ³	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
CEA shroud bolts - Continued						in MRP-227, Rev. 2, and specifically, as to why this component type was not listed and included for screening in Table 3-3 of MRP-227, Rev. 1-A. ³	
Core Support Barrel Assembly (CSBA)							
CSBA upper cylinder girth welds (i.e., upper flange weld [UFW] and upper girth weld [UGW])	Yes	P NOTE: In Table 3-2 of MRR-227 Rev. 1-A, separate items for the UFW and the UGW (both P in Rev. 1-A)	Yes	P or E NOTE: One consolidated line item for the UFW and UGW in Table 3-2 of Rev. 2.	Yes	See Audit Topic column entry	Audit needs to clear up why P in Table 3-2 of Rev. 1-A but now either P or E in Table 3-2 of Rev. 2
CSBA upper cylinder axial welds (UAWs)	No	NA	Yes	E	Yes	New line item entry for core barrel UAWs in Table 3-2 (corresponding item for the Expansion category UAWs in Table 4-5 of Rev. 2 is Item C5.3). However, this referenced component type was never assessed for screening in a corresponding line item in Table 3-2 of MRP-227, Rev. 1-A. Thus, this fails into the scope of a generic logistics issue on the review of changes being made in MRP-227, Rev. 2, and specifically, as to why this component type was not listed and included for screening in Table 3-3 of MRP-227, Rev. 1-A. ³	Core barrel axial welds are normally Expansion category welds for either core barrel circumferential flange welds or core barrel circumferential cylinder welds. No audit is needed here for the new Table 3-2 item for the CSBA UAWs. However the generic logistics issue why the core stabilizing lug component were not assessed for screening in Table 3-2 of MRP-227, Rev. 1-A needs to be addressed; see the Note 3 clarification in this table.

Assembly/Component Description ³	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
CSBA lower girth welds (i.e., middle girth weld [MGW] and lower girth weld/lower flange weld [LFW/LGW])	Yes	P	Yes	P or E	Yes	See Audit Topic column entry	Audit needs to clear up why P in Table 3-2 of Rev. 1-A but now either P or E in Table 3-2 of Rev. 2.
Lower cylinder axial welds (i.e., middle axial welds [MAWs] lower axial welds [LAWs])	Yes	E	Yes	E	Yes	See Audit Topic column entry	Impact of applicable St. Lucie operating experience needs to be discussed relative to the 40 – 80 final inspection category (i.e., E) of the CSBA MAWs and LAWs.
Upper core barrel flange	Yes	NAM	Yes	X	No	Upper core barrel flange elevated to ASME-based Existing Program component in Table 3-2 of Rev. 2.	No need to subject the Table 3-2 line item for the upper core barrel flange to an audit discussion. Change is conservative for aging management objectives.
Lower core barrel flange Lower core barrel flange - Continued	Yes	E	Yes	E	Yes	Is this an ASME Section XI Examination Category B-N-2 or B-N-3 component type?	Still Expansion for 40 – 80. However, audit to clear up whether the lower core barrel flange is an ASME Section XI Examination Category B-N-2 or B-N-3 component similar to the way the upper core barrel flange is designated as an ASME component type in Table 3-2 of Rev. 2. If the lower core barrel flange is an ASME component, then why isn't it being elevated to the Existing Program category in the manner the upper core barrel flange was made an Existing Program component.
Lower CSB flexure weld	Not Sure	See Audit Topic column entry discussion.	Yes	P or E	Yes	Not sure whether the line item covering the CSB flexure weld in Table 3-2 of Rev. 1-A is listing the component as the "Lower core barrel flange weld." If so. Table 3-2 lists the weld as a Primary component, but Table 4-1 of MRP-227, Rev. 1-A allows it to be P or NAM category (i.e. NAM category if a screening analysis screens the flexure weld type out for both fatigue and stress corrosion cracking (SCC)	Limited audit discussion just to confirm that for going from Rev. 1-A to Rev. 2, the screening check for fatigue and SCC mechanisms applying to the lower CSB flexure weld forms the basis for changing from "P or NAM" to "P or E". It that is the case, the change is conservative for the manner the final inspection categorization basis is derived on a plant-specific screening evaluation basis. For the current and pending St. Lucie SLRA review, the plant-specific screening activities for the CSB flexure weld did not screen the weld type in for either fatigue or SCC and the applicant placed the weld in the Expansion category for the program that will be implemented during the subsequent period of extended operation. Under the Rev. 1-A, the screening basis for the St. Lucie unit CSB flexure welds for the first renewed operating period, would place the CSB flexure welds into NAM category.

Assembly/Component Description ³	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Core stabilizing lugs (including shims and associated bolts)	No	NA	Yes	X	Yes	New screening-based line item for the component type for Table 3-2 (and Table 4-8) of MRP-227, Rev. 2. MRP 2018-01 provides the basis for the changes. No issue with this. However, this referenced component type was never assessed for screening in a corresponding line item in Table 3-2 of MRP-227, Rev. 1-A. Thus, this fails into the scope of a generic logistics issue on the review of changes being made in MRP-227, Rev. 2, and specifically, as to why this component type was not listed and included for screening in Table 3-3 of MRP-227, Rev. 1-A. ³	No audit of the Rev. 2 change basis is necessary for including the core stabilizing lugs in as new Existing Program components for Rev. 2. However the generic logistics issue why the core stabilizing lug component were not assessed for screening in Table 3-2 of MRP-227, Rev. 1-A needs to be addressed; see the Note 3 clarification in this table.
Thermal shield positioning pins	Yes	NAM	No	NA	Yes	See Audit Topic column entry	Audit to clear up why the line item for the thermal shield positioning pins in Table 3-2 of Rev. 1-A was not included in LSS subsection of Table 3-2 of Rev. 2. Do the thermal shield positioning pins serve a safety-related intended function?
Core Shroud Assembly (CSA)							
Shroud Plates (CE units with bolted core shroud assemblies only – entire assembly)	Yes	P	No (i.e., pretty sure it is a “No” for the Table 3-2 in Rev. 2)	NA	Yes	See Audit Topic column entry	Just to confirm this line item was removed in Table 3-2 of Rev. 2 because it only previously applied to the two CE units with bolted core shrouds (i.e., Palisades and Ft. Calhoun) which have decommissioned.
Shroud plates (CE with welded core shroud assemblies in two vertical sections or welded core shroud assemblies utilizing full height shroud plates)	Yes	P	Yes	P	No	No comments.	The core shroud plates on units with welded core shroud designs remain as a Primary category components for Rev. 2. No audit of this line item in Table 3-2 is necessary.

Assembly/Component Description ³	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Former Plates (CE units with bolted core shroud assemblies only – entire assembly)	Yes	P	No (i.e., pretty sure it is a “No” for the Table 3-2 in Rev. 2)	NA	Yes	See Audit Topic column entry	Just to confirm this line item was removed in Table 3-2 of Rev. 2 because it only previously applied to the two CE units with bolted core shrouds (i.e., Palisades and Ft. Calhoun) that have decommissioned.
Former plates (CE with welded core shroud assemblies in two vertical sections or welded core shroud assemblies utilizing full height shroud plates)	Yes	P	Yes	P	No	No comments.	The former plates on units with welded core shroud designs remain as a Primary category components for Rev. 2. No audit of this line item in Table 3-2 is necessary.
Core shroud ribs and rings (CE units with weld core shrouds utilizing full height shroud plates only)	Yes	E	No	NA	Yes	Line items for the core shroud ribs and the core shroud rings were removed from the scope of Table 3-2 in Rev. 2. The Item C3.2 core shroud ribs and rings were removed as listed Expansion category components in the revision to Item C3 in Table 4-2 of MRP-227, Rev. 2.	Audit will need to justify: (a) why Table 3-2 in Rev. 2 does not include any screening items or a consolidated screening item for core shroud ribs and ribs in units with welded core shrouds using full height plates, and (b) why these ribs and rings are no longer Expansion category base metal component types for CE units with welded core shrouds utilizing full height shroud plates.
Core shroud bolts	Yes	P	No	NA	Yes	Line item for the core shroud bolts was removed from the scope of Table 3-2 in Rev. 2.	Just to confirm this line item for the core shroud bolts was removed from the scope of Table 3-2 in Rev. 2 because it only previously applied to the two CE units with bolted core shrouds (i.e., Palisades and Ft. Calhoun) that have decommissioned.
Core support barrel-to-shroud bolts	Yes	E	No	NA	Yes	Line item for the core support barrel-to-shroud bolts was removed from the scope of Table 3-2 in Rev. 2.	Just to confirm this line item for the core support barrel-to-shroud bolts was removed from the scope of Table 3-2 in Rev. 2 because it only previously applied to the two CE units with bolted core shrouds (i.e., Palisades and Ft. Calhoun) that have decommissioned.
Core shroud tie rods and nuts	Yes	NAM	Yes	P	No	Elevated to Primary in Table 3-2 of Rev. 2 per updated screening basis in MRP-2018-01	No need to audit the basis for elevating the core shroud tie rods and nuts to Primary components in Table 3-2 of Rev. 2.
Core shroud guide lugs (including lug inserts and insert bolts)	Yes	X	Yes	X	No	The stated core shroud lugs and shims remain Existing Program components in Table 3-2 of Rev. 2.	No need to audit the Existing Program basis for the core shroud lugs, shims, and shim bolts.

Assembly/Component Description ³	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Incore Instrumentation (ICI) Components							
ICI thimble tubes (CE units with upper head mounted ICI tubes)	Yes	X	Yes	X	No	No comments.	The IXI thimble tubes remain as an Existing Program components for Rev. 2. No audit of this line item in Table 3-2 is necessary.
ICI Nozzles (CE Units with System 80 Bottom Mounted Nozzles)	No	NA	Yes	NAM	Yes	This is a new component-specific line item in Table 3-2 of MRP-227, Rev. 2. What type of instrumentation is the EPRI MRP referring to here? Is this safety-related instrumentation housed in the ICI bottom head nozzles? Additionally, this referenced component type was never assessed for screening in a corresponding line item in Table 3-2 of MRP-227, Rev. 1-A. Thus, this fails into the scope of a generic logistics issue on the review of changes being made in MRP-227, Rev. 2, and specifically, as to why this component type was not listed and included for screening in Table 3-3 of MRP-227, Rev. 1-A. ³	Final inspection categorization basis for the ICI bottom mounted nozzles needs to be discussed as part of the audit. Additionally, the generic logistics issue why the core stabilizing lug component were not assessed for screening in Table 3-2 of MRP-227, Rev. 1-A needs to be addressed; see the Note 3 clarification in this table.

TABLE #CE1 NOTES:

1. Inspection Category Column Entry Abbreviations: (1) P – “Primary” Inspection Category, (2) E – “Expansion” Inspection Category, (3) NAM – “No Additional Measures” Inspection Category, and (4) N/A – not applicable.
2. For audit objectives, the staff has screened the component-specific aging mechanism screening and inspection category basis in MRP-227, Rev. 2 Table 3-2 in accordance with the following color coded and highlighted text – (1) Blue highlighted text – component-specific screening results and final inspection category in Table 3-2 of MRP-227, Rev. 2 for the specified component type do not need to be within the scope of the audit, (2) Yellow highlight text – aging mechanism screening results or final inspection category for the designated component type in Table 3-2 of MRP-227, Rev. 2 is subject to a limited audit review for confirmatory objectives or clarifications; and (3) Green highlighted text – aging mechanism screening results or final inspection category for the designated component type in Table 3-2 of MRP-227, Rev. 2 needs to be subject to more detailed audit discussions or alternatively an RAI, including coverage of applicable item specific Note bases that apply to the component type in Table 3-2 of MRP-227, Rev. 2.
3. In other words, the component type was included in the RVI design since day one of critical reactor power operations; yet only now is the EPRI MRP including this as an assessed component type for an aging mechanism screening assessment in Table 3-2 of MRP-227, Rev. 2. Thus, the component type never got considered for a 40 – 60 Year risk-informed screening in Table 3-2 of MRP-227, Rev. 1-A and therefore was never appropriately assessed for the final inspection categorization of the component type for the first renewal (Year 40 – 60) period of the plant; this type of screening basis change raises a logistics issue for the staff for first renewal periods. ; this type of screening basis change raises a logistics issue for the staff for first renewal periods. This is a generic logistics issue for all new B&W, CE, and Westinghouse component-specific line items in Table 3-1, 3-2, and 3-3 of MRP-227, Rev. 2 where the prior version of the table in MRP-227, Rev. 1-A did not include a corresponding screening-based line item for the specified component type listed in Table 3-1, 3-2 or 3-3 of MRP-227, Rev. 2.

II. AUDIT TABLE #CE2 - ASSESSED MRP-227 CHAPTER 4, TABLE 4-2 CE COMPONENT COMPARISONS – CE PRIMARY CATEGORY COMPONENTS INSPECTION RESULT CRITERIA REVISIONS IN REV. 2¹

EPRI MRP Primary Item No. Designation And Component/Scope of Units	Included as Primary in Rev. 1-A?	Method, Frequency, and Expansion Links in Rev. 1-A / Mechanism(s) of Interest	Included as Primary in Rev. 2?	Method, Frequency, and Expansion Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Core Shroud Assembly (CSA) Primary Component Types							
C1. Core shroud bolts (CE units with bolted core shroud designs - Only)	Yes	<i>40 – 60 Methods and Frequency:</i> Volumetric inspection (by UT) of 100% of accessible core shroud bolts at between 25 – 35 EFPY with subsequent UT inspections on a 10-Year reinspection frequency. Examinations look for evidence of cracking that may be indicative of irradiation embrittlement, irradiation-assisted stress relaxation (IASCC), fatigue or irradiation-assisted stress relaxation or creep occurring in the bolts <i>40 – 60 Expansion Components:</i> Item C1.1, LSS core support column bolts and Item C1.2 core support barrel-to-shroud bolts in Table 4-5 of MRP-227, Rev. 1-A	No	NA - Item C1 bolt types deleted from scope of Table 4-2 in Rev. 2.	Yes	Item C1 for the core shroud bolts deleted from the scope of Table 4-2 in Rev. 2. According to the PWROG RAI response statements on the pending WCAP-17096, Rev. 3 review, only two U.S. CE PWRs were designed with bolted core shrouds – the Ft. Calhoun and Palisades PWR units. Both of these reactor units have decommissioned.	Audit to confirm that removal of Item C1 from the scope of Table 4-2 in Rev. 2 is based on the decommissioning of the Ft. Calhoun and Palisades units.
C2 Core shroud plate-to-former plate weld (CE units with welded core shrouds assembled in two vertical shroud sections – Only)	Yes	<i>40 – 60 Methods and Frequency:</i> Enhanced EVT-1 visual inspections of the axial and horizontal weld seams (at the shroud re-entrant corners) no	Yes	<i>40 – 60 Methods and Frequency:</i> Same as those for 40 – 60 in Item C2 of Table 4-2 in Rev. 1-A.	No	Cited Primary and Expansion category components and Expansion-link relationships in Item C2 of Table 4-2 in MRP-227, Rev. 2 remain the same	No need to include the Table 4-2 Item C2 weld type within the scope of the audit, as the weld type is still Primary, with no changes to Item C2 in Table 4-2, MRP-227, Rev. 2.

EPRI MRP Primary Item No. Designation And Component/Scope of Units	Included as Primary in Rev. 1-A?	Method, Frequency, and Expansion Links in Rev. 1-A / Mechanism(s) of Interest	Included as Primary in Rev. 2?	Method, Frequency, and Expansion Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
<p>C2 Core shroud plate-to-former plate weld – Continued</p> <p>(CE units with welded core shrouds assembled in two vertical shroud segments – Only)</p>		<p>later than 2 refueling outages from the beginning of the period of extended operation. Subsequent EVT-1 re-inspections on a 10-Year interval. The EVT-1 inspections look for evidence of cracking in the weld for the IASCC mechanism or cracking that might reveal loss of fracture toughness in occurring in the welds by an irradiation embrittlement mechanism.</p> <p><i>40 – 60 Expansion Components:</i> Item C1.2 core shroud remaining axial welds in Table 4-5 of MRP-227, Rev. 1-A.</p>		<p><i>40 – 60 Expansion Components:</i> Expansion components remain as the Item C1.2 core shroud remaining axial welds in Table 4-5 of MRP-227, Rev. 1-A.</p>		<p>as those for Item C2 in Table 4-2 of MRP-227, Rev. 1-A.</p>	
<p>C3 Core shroud plates</p> <p>(CE units with welded core shrouds assembled with full height shroud plates– Only)</p>	<p>Yes</p>	<p><i>40 – 60 Methods and Frequency:</i> Enhanced EVT-1 visual inspections of the axial weld seams (at the shroud re-entrant corners) no later than 2 refueling outages from the beginning of the period of extended operation. Subsequent EVT-1 re-inspections on a 10-Year interval. The EVT-1 inspections look for evidence of cracking in the weld for the IASCC mechanism or</p>	<p>Yes</p>	<p><i>60 - 80 Methods and Frequency:</i> Same as those for 40 – 60 in Item C3 of Table 4-2 in Rev. 1-A.</p> <p><i>60 – 80 Revised Expansion Components:</i> Expansion components only remain as the Item C3.1 core shroud remaining axial welds in Table 4-5 of MRP-227, Rev. 1-A.</p>	<p>Yes</p>	<p>See Audit Topic column entry</p>	<p>Basis for removing the core shroud ribs and rings as cited Expansion category components for 60 – 80 needs to be discussed.</p>

EPRI MRP Primary Item No. Designation And Component/Scope of Units	Included as Primary in Rev. 1-A?	Method, Frequency, and Expansion Links in Rev. 1-A / Mechanism(s) of Interest	Included as Primary in Rev. 2?	Method, Frequency, and Expansion Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
C3 Core shroud plates - Continued (CE units with welded core shrouds assembled with full height shroud plates- Only)		cracking that might reveal loss of fracture toughness in occurring in the welds by an irradiation embrittlement mechanism. <i>40 – 60 Expansion Components:</i> Item C3.1 Core shroud remaining axial welds and Item C3.2 core shroud ribs and rings in Table 4-5 of MRP-227, Rev. 1-A.		Previous Item C3.2 core shroud ribs and rings removed as cited Expansion category components for 60 -80 in Tables 4-2 and 4-5 of MRP-227, Rev. 2..			
C4 Core shroud assembly (including core side surfaces, high fluence shroud joints, top and bottom plates [for alignment checks], and bolts and bolt holes). (CE units with bolted core shroud designs - Only) C4 Core shroud assembly – Continued	Yes	<i>40 – 60 Methods and Frequency:</i> VT-3 visual inspection of the core side surfaces, high fluence shroud joints, top and bottom plates [for alignment checks], and bolts and bolt holes no later than 2 refueling outages from the beginning of the period of extended operation. Subsequent VT-3 re-inspections on a 10-Year interval. The VT-3 inspections look for evidence of cracking that might be indicative of irradiation embrittlement (IE) occurring in the cited core shroud assembly components or evidence of distortion occurring in the components.	No	NA - Item C4 core shroud assembly components deleted from scope of Table 4-2 in Rev. 2.	Yes	Item C4 for the core shroud assembly components (CE bolted shroud designs only) deleted from the scope of Table 4-2 in Rev. 2. According to the PWROG RAI response statements on the pending WCAP-17096, Rev. 3 review, only two U.S. CE PWRs were designed with bolted core shrouds – the Ft. Calhoun and Palisades PWR units. Both of these reactor units have decommissioned.	Audit to confirm that removal of Item C4 from the scope of Table 4-2 in Rev. 2 is based on the decommissioning of the Ft. Calhoun and Palisades units.

EPRI MRP Primary Item No. Designation And Component/Scope of Units	Included as Primary in Rev. 1-A?	Method, Frequency, and Expansion Links in Rev. 1-A / Mechanism(s) of Interest	Included as Primary in Rev. 2?	Method, Frequency, and Expansion Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
(CE units with bolted core shroud designs - Only)		40 – 60 Expansion Components: None.					
C4.a Core shroud assembly (weld seam between upper and lower shroud segments) (CE units with welded core shrouds assembled in two vertical shroud segments – Only)	Yes	40 – 60 Methods and Frequency: VT-1 visual inspection of 100% of the circumferential seam weld between the shroud segments no later than 2 refueling outages from the beginning of the period of extended operation. Subsequent VT-1 re-inspections on a 10-Year interval. The VT-1 inspections look for evidence of cracking that might be indicative of irradiation embrittlement (IE) occurring in the weld or evidence of distortion occurring in the weld. 40 – 60 Expansion Components: None.	Yes	60 - 80 Methods and Frequency: Same as those for 40 – 60 in Item C3 of Table 4-2 in Rev. 1-A. 60 – 80 Expansion Components: None.	No	Cited Primary component in Item C2 of Table 4-2 in MRP-227, Rev. 2 remain the same as those for Item C2 in Table 4-2 of MRP-227, Rev. 1-A.	No need to include the Table 4-2 Item C4.a weld type within the scope of the audit, as the weld type is still Primary, with no changes to Item C4.a in Table 4-2, MRP-227, Rev. 2.
C18. Core shroud tie rods and nuts (All CE units with core shroud tie rods and nuts)	No	NA	Yes	60 - 80 Methods and Frequency: Non-qualified visual inspection for loss of material due to wear or loss of preload due to irradiation-enhance stress relaxation or creep (ISR/IC) no later than 2 refueling outages from the beginning of the period of extended operation.	Yes	New Primary component type for 60 – 80.	Audit discussions are necessary due to the fact that this is a new lie item for 60 - 80. 1) Which specific U.S. CE PWR units are applicable here? As a minimum, due to the current ongoing and pending St. Lucie SLRA review, we know it applies to the St. Lucie 1 and 2 units. 2) Why isn't the inspection method specified as a VT-3 visual method? Specifically,

EPRI MRP Primary Item No. Designation And Component/Scope of Units	Included as Primary in Rev. 1-A?	Method, Frequency, and Expansion Links in Rev. 1-A / Mechanism(s) of Interest	Included as Primary in Rev. 2?	Method, Frequency, and Expansion Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
				Subsequent inspections on a 10-Year frequency. <i>60 – 80 Expansion Components: None.</i>			EPRI MRP has never specified that a non-qualified NDE or visual inspection techniques could be applied as aging management activity bases in the Chapter 5 text of the prior -A or Rev. 1-A versions of MRP-227. Use on non-qualified techniques will also be a general discussion topic for MRP-227, Rev. 2.
Core Support Barrel Assembly (CSBA)							
C5. CSBA Upper flange weld (UFW) (All CE units) Item C5. CSBA UFW – Continued	Yes	<i>40 – 60 Methods and Frequency:</i> EVT-1 visual inspection of 100% of accessible weld length (and ¾ inch of adjacent base metal) no later than 2 refueling outages from the beginning of the period of extended operation. Subsequent EVT-1 re-inspections on a 10-Year interval. The EVT-1 inspections look for evidence of induced by a stress corrosion cracking mechanism. <i>40 – 60 Expansion Components:</i> Expansion components are the: (a) Item C5.2, CSBA upper girth weld (UGW), (b) Item C5.1, CSBA lower girth weld/lower flange weld (LGW/LFW), (c) Item	Yes	<i>60 – 80 Methods and Frequency:</i> Same as those for Item C5 in Table 4-2 of MRP-227, Rev. 1-A, with the exception that it allows use of either EVT-1, UT, or ECT qualified methods. <i>60 – 80 Expansion Components:</i> Same as those for Item C5 in Table 4-2 of MRP-227, Rev. 1-A, with the exception that Item C5 in Table 4-2 of Rev. 2 adds in the Item C5.5 CSBA flexure weld as an additional Expansion category component for the CSBA UFW.	Yes	Per the screening based line item for the CSA flexures weld in Table 3-2 of MRP-227, Rev. 2, the flexure weld may be categorized as either a Primary or Expansion category components, as established based on the results of a component-specific fatigue and SCC screening analysis for the flexure weld (that presumably cover an 80-Year period).	A limited audit discussion is necessary for Item C5. That is, confirm that the inspection of the Primary UFW inspection would not potentially <i>expand</i> to the CSBA flexure weld if the 80-Year screening results for fatigue or SSC would place the CSBA flexure weld in as a Primary category component for inspection and that Item C7 in Tables 4-2 and 5-2 for the CSBA flexure weld (as a Primary component) would apply in instead of Item C5.5 (for the flexure weld) in Table 4-5, MRP-227, Rev. 2.

EPRI MRP Primary Item No. Designation And Component/Scope of Units	Included as Primary in Rev. 1-A?	Method, Frequency, and Expansion Links in Rev. 1-A / Mechanism(s) of Interest	Included as Primary in Rev. 2?	Method, Frequency, and Expansion Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
(All CE units)		C5.3 CSBA upper axial welds (UAWs), and (d) LSS core support columns.					
C6. CSBA middle girth weld (MGW) (All CE units)	Yes	<p><i>40 – 60 Methods and Frequency:</i> EVT-1 visual inspection of 100% of accessible MGW length (from the OD and ¾ inch of adjacent base metal) no later than 2 refueling outages from the beginning of the period of extended operation. Subsequent EVT-1 re-inspections on a 10-Year interval. The EVT-1 inspections look for evidence of induced by a stress corrosion cracking (SCC) or irradiation-assisted SCC, or that may be indicative that Irradiation embrittlement (IE) is occurring in the component.</p> <p><i>40 – 60 Expansion Components:</i> Expansion components are the: (a) Item C6.1, CSBA middle axial welds (MAWs), (b) Item C6.2, CSBA lower axial welds (LAWs), (c) Item C6.3 LSS core support columns</p>	Yes	<p><i>60 – 80 Methods and Frequency:</i> Same as those for Item C6 in Table 4-2 of MRP-227, Rev. 1-A, with the exception that it allows use of either EVT-1, UT, or ECT qualified methods.</p> <p><i>60 – 80 Expansion Components:</i> Same as those for Item C5 in Table 4-2 of MRP-227, Rev. 1-A, with the exception that Item C5 in Table 4-2 of Rev. 2 adds in the Item C6.4 upper internals assembly (UIA) fuel alignment plate as an additional Expansion category component for the CSBA MGW.</p>	Yes	No comments.	Limited audit to confirm that the UIA fuel alignment plates and LSS core support plates will be Primary plate component types per Items C10 an C9 line item entries in Tables 4-2 and 5-2 of MPR-227, Rev. 2 if the plate type screens in for fatigue for the needed 80-Year fatigue screening analysis.
C7. CSB flexure weld	Yes	<i>40 – 60 Methods and Frequency:</i> EVT-1	Yes	<i>60 – 80 Methods and Frequency:</i> Same as	Yes	Per Item C7 entries in Table 4-2 of Rev. 1-A and	See limited audit topic for previous Item C5. That is, if the

EPRI MRP Primary Item No. Designation And Component/Scope of Units	Included as Primary in Rev. 1-A?	Method, Frequency, and Expansion Links in Rev. 1-A / Mechanism(s) of Interest	Included as Primary in Rev. 2?	Method, Frequency, and Expansion Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
(All CE units with welded core shroud designs regardless of plate or segment type)		visual inspection of the CSBA flexure weld if screening for cracking cannot be ruled out by component-specific fatigue and SCC screening analysis. Subsequent EVT-1 re-inspections on a 10-Year interval. The EVT-1 inspections look for evidence of induced by a stress corrosion cracking (SCC) or fatigue. <i>40 – 60 Expansion Components: None.</i>		those for Item C6 in Table 4-2 of MRP-227, Rev. 1-A, with the exception that it allows use of either EVT-1, UT, or ECT qualified methods. <i>60 – 80 Expansion Components: None.</i> <i>60 – 80 Screening Change: if flexure weld screens out for both SCC and fatigue under an 80-Year analysis, the CSBA flexure weld is placed in the Expansion category per Item C5.5 in Table 4-5 of MRP-227, Rev. 2.</i>		Rev. 2, "Examination coverage to be defined by evaluation to determine the potential location and extent of cracking." In MRP-227, Rev. 2, the CSBA flexure weld gets placed in the Expansion category (as linked to inspections of the Primary CSBA UFW) if the 80-Year screening analysis for the flexure weld screens the weld out for both fatigue and SCC mechanisms over the 80-Year assessment period. For the prior 60-Year basis, the flexure weld got placed in NAM category if the component screened out for 60-Year fatigue and SCC.	CSBA flexure weld screens in for either SCC or fatigue under the 80-Year analysis and is put in as a Primary component for the 80-Year PWR Vessel Internals Program covering the 60 – 80 Year period, the line item for the CSBA flexure as an Expansion category weld per Item C5.5, in Table 4-5 of MRP-227, Rev. 2 does not apply.
Upper Internals Assembly (UIA)							
C10 UIA Fuel alignment plate (CE units with welded core shrouds assembled with full height shroud plates– Only) C10 UIA Fuel alignment plate - Continued	Yes	<i>40 – 60 Methods and Frequency: EVT-1 visual inspection of the UIA fuel alignment plate no later than two refueling outages from the beginning of the license renewal period, but only if screening for fatigue-induced cracking cannot be ruled out by component-specific fatigue screening analysis. Subsequent EVT-1 re-inspections on a 10-Year interval.</i>	Yes	<i>60 – 80 Methods and Frequency: Same as those for 40 – 60 in Item C10 of Table 4-2 in Rev. 1-A.</i> <i>60 – 80 Expansion Components: None</i>	Yes	In both Items C10 in Table 4-2 of the Rev. 1-A and Rev. 2 reports, the "Examination Coverage" column entries for the items state: <i>"Examination coverage to be defined by evaluation to determine potential location and extent of fatigue cracking."</i> In Section 3.3.1 of the staff's Dec. 16, 2011 SE for MRP-227-A, the staff approved that a minimum	If fatigue is not screened out for the UIA fuel alignment plate (and contrary to the referenced Item C10 "examination coverage" statement), EPRI MRP and Westinghouse need to be prepared to discuss what is the 80-year rebase-lined minimum coverage criterion that will be used and set for the UIA fuel alignment plate for EVT-1 inspection credit of the plate. Generically, for component items like Item C10 with terminology like "no later than

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(CE units with welded core shrouds assembled with full height shroud plates– Only)		The EVT-1 inspections look for evidence of cracking (fatigue) or irradiation or cracking that may be indicated of irradiation embrittlement (IE). <i>40 – 60 Expansion Components: None.</i>				75% minimum area/volume criterion for non-redundant components and minimum 75% population for redundant components would be acceptable for inspection credit if the inspections of the components did not reveal evidence of relevant defects. For some more partially-restricted components (like Westinghouse or CE design core barrel welds), the staff approved a reduction of that criterion to minimum 50% area/volume criterion in the staff's April 25, 2019, SE for MRP-227, Rev. 1-A.	two refueling outages from the beginning of the license renewal period," we need the EPRI MRP to clear up whether EPRI MRP is talking about refueling outages prior to entry into the license renewal period or after entry into the license renewal period.
Control Element Assembly (CEA)							
C11 CEA instrument guide tubes and supports (for peripheral locations) (All CE design units with instrument guide tubes attached to the CEA shroud assemblies)	Yes	<i>40 – 60 Methods and Frequency: VT-3 visual inspections of 100% of the peripheral CEA instrument guide tubes no later than two refueling outages from the beginning of the license renewal period; The VT-3s focus on the CEA supports and the welds connecting the guide tubes to the supports. Subsequent EVT-1 re-inspections on a 10-Year ISI frequency. VT-3 inspections look for</i>	Yes	<i>60 – 80 Methods and Frequency: Same as those for 40 – 60 in Item C11 of Table 4-2 in Rev. 1-A. 60 – 80 Expansion Components: Item C11.1 in Table 4-5, MRP-227, Rev. 2; same as those (i.e., the non-peripheral CEA instrument guide tubes) for 40-60 per Item C11.1 of Table 4-5, MRP-227, Rev. 1-A.</i>	Yes	For the applicable plant designs, Item C11.1 specifies a minimum 75% population criterion (of inspected components) for VT-3 inspection credit.	Only to confirm that they are still using the minimum 75% population criterion for inspection credit.

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C11 CEA instrument guide tubes and supports (for peripheral locations) - Continued (All CE design units with instrument guide tubes attached to the CEA shroud assemblies)		evidence of cracking (fatigue, SCC). <i>40 – 60 Expansion Components:</i> Item C11.1 in Table 4-5 of Rev. 1-A, remaining (i.e., non-peripheral) CEA instrument guide tubes.					
C19. CEA shroud bolts (All CE units with CEA shroud bolts)	No	NA	Yes	<i>60 – 80 Methods and Frequency:</i> Non-qualified visual inspection of the CEA shroud bolts for management of loss of material due to wear and potential loss of preload due to ISR/IC no later than two refueling outages from the beginning of the license renewal period. Subsequent inspections on a 10-Year ISI re-inspection frequency. <i>60 – 80 Expansion Components:</i> None	Yes	EPRI has never before proposed use of non-qualified visual inspections for aging management objectives. This is new.	Use of non-qualified visual methods for aging management definitely needs to be discussed on a generic basis for the EPRI MRP as this is a new aging management inspection basis. Again, terminology "no later than two refueling outages from the beginning of the license renewal period" needs to be clarified on a generic basis.
Lower Support Structure (LSS)							
C9. Core support plate (All CE units designed with a lower core support plate)	Yes	<i>40 – 60 Methods and Frequency:</i> EVT-1 visual inspection of the LSS core support plate no later than two refueling outages from the beginning of the license renewal period, but only if screening for fatigue-induced cracking	Yes	<i>60 – 80 Methods and Frequency:</i> Same as those for 40 – 60 in Item C10 of Table 4-2 in Rev. 1-A. <i>60 – 80 Expansion Components:</i> None	Yes	Comments are akin to those for the UIA fuel alignment plates in Item C10.	If fatigue is not screened out for the LSS core support plate (and contrary to the referenced Item C9 "examination coverage" statement), EPRI MRP and Westinghouse need to be prepared to discuss what is the 80-year rebase-lined minimum coverage criterion that will be used and set for the LSS core support plate for

EPRI MRP Primary Item No. Designation And Component/Scope of Units	Included as Primary in Rev. 1-A?	Method, Frequency, and Expansion Links in Rev. 1-A / Mechanism(s) of Interest	Included as Primary in Rev. 2?	Method, Frequency, and Expansion Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
		cannot be ruled out by component-specific fatigue screening analysis. Subsequent EVT-1 re-inspections on a 10-Year interval. The EVT-1 inspections look for evidence of cracking (fatigue) or irradiation or cracking that may be indicated of irradiation embrittlement (IE). <i>40 – 60 Expansion Components: None.</i>					EVT-1 inspection credit of the plate. Generically, for component items like Item C10 with terminology like "no later than two refueling outages from the beginning of the license renewal period," we need the EPRI MRP to clear up whether EPRI MRP is talking about refueling outages prior to entry into the license renewal period or after entry into the license renewal period.
C12. LSS deep beams (core support beams) (CE units with welded core shroud designs fabricated from full height shroud plates only)	Yes	<i>40 – 60 Methods and Frequency:</i> EVT-1 visual inspections of 25% the LSS deep beams no later than two refueling outages from the beginning of the license renewal period. Subsequent EVT-1 re-inspections on a 10-Year interval. The EVT-1 inspections look for evidence of cracking (fatigue). <i>40 – 60 Expansion Components:</i> The remaining LSS deep beams.	Yes	<i>60 – 80 Methods and Frequency:</i> Same as those for 40 – 60 in Item C12 of Table 4-2 in Rev. 1-A. <i>60 – 80 Expansion Components:</i> The remaining LSS deep beams (i.e., the 75% population of deep beams that are not inspected as Primary deep beam components).	Yes	Item C12 states that the Expansion components are the remaining 75% population of the LSS deep beams that are not inspected as Primary deep beam components. But neither Table 4-5 in MRP-227-A nor in MRP-227, Rev. 1-A includes any line item for the Expansion category Remaining LSS deep beams.	EPRI MRP needs to discuss and justify why Table 4-5 in MRP-227, Rev. 2 has not been fixed to include and define a new C12.1 line item for the "Remaining LSS deep beams."

TABLE #CE2 NOTES:

- The staff has screened audit needs for the specified MRP-227, Rev. 2 Table 4-2 inputs in accordance with the following color coded basis: (1) Blue highlighted text – specified Primary category component type does not need to be subject to an audit review for the component-specific inspection result basis; (2) Yellow highlighted text – specified Primary category component type is subject to a limited audit review of the component-specific inspection result basis, but only for confirmatory clarification objectives; and (3) Green highlighted text – inspection basis (including Expansion component link basis) for the specified Primary category component type in Table 4-2 of MRP-227, Rev. 2 needs to be subject to more detailed audit discussions, included applicable item specific Note bases that apply to the component type in Table 4-2 of MRP-227, Rev. 2.

III. AUDIT TABLE #CE3 - ASSESSED MRP-227 CHAPTER 4, TABLE 4-5 CE COMPONENT COMPARISONS – CE EXPANSION CATEGORY COMPONENTS INSPECTION RESULT CRITERIA REVISIONS IN REV. 2¹

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Expansion in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Expansion in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Core Shroud Assembly (CSA) Expansion Category Components							
C1.1 CSA – core support column bolts (CE units with bolted core shrouds only)	Yes	40 – 60 <i>Methods and Frequency</i> : UT volumetric inspections of 100% (or as supported by plant-specific analysis of the accessible core support column bolts once every 10 years; inspections look for evidence of cracking (SCC fatigue) and manage irradiation embrittlement (IE). 40 – 60 <i>Primary Components</i> : The Table 4-1 Item C1 core shroud bolts.	No	NA	Yes	Should apply only to the Ft. Calhoun and Palisades CE units. Both Ft. Calhoun and Palisades have entered into permanent defueling license operations	Audit only to confirm that line item C1.1 was removed from Rev. 2 due to the permanent shutdown of the Ft. Calhoun and Palisades units.
C1.2 CSA – barrel-to-shroud bolts (CE units with bolted core shrouds only)	Yes	40 – 60 <i>Methods and Frequency</i> : UT volumetric inspections of 100% of the accessible core support column bolts once every 10 years; inspections look for evidence of cracking (SCC fatigue) and manage irradiation embrittlement (IE). 40 – 60 <i>Primary Components</i> : The Table 4-1 Item C1 core shroud bolts.	No	NA	Yes	Should apply only to the Ft. Calhoun and Palisades CE units. Both Ft. Calhoun and Palisades have entered into permanent defueling license operations	Audit only to confirm that line item C1.2 was removed from Rev. 2 due to the permanent shutdown of the Ft. Calhoun and Palisades units.

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C2.1 CSA – remaining (cylinder) axial welds (CE units with weld core shrouds fabricated in two cylinder section only)	Yes	<p><i>40 – 60 Methods and Frequency:</i> If triggered, EVT-1 visual inspection of the axial weld length and 3/4-inch of adjacent base metal on a 10 year frequency; EVT-1s look for evidence of cracking (IASCC) and manage irradiation embrittlement (IE).</p> <p><i>40 – 60 Primary Components:</i> The Table 4-1 Item C2 core shroud plate-to-former plate welds.</p>	Yes	<p><i>60 - 80 Methods and Frequency:</i> Same as those for 40 – 60 in Item C2.1 of Table 4-5 in Rev. 1-A, with some minor administrative edits</p> <p><i>60 – 80 Primary Components:</i> Remains as the Table 4-1 Item C2 core shroud plate-to-former plate welds.</p>	No	Item C2 Primary axial and circumferential welds are only inspected at the location of the re-entrant corners.	No need to audit this item in Rev. 2.
C3.1 CSA – remaining (cylinder) axial welds (CE units with weld core shrouds fabricated with full height shroud plates only)	Yes	<p><i>40 – 60 Methods and Frequency:</i> If triggered, EVT-1 visual inspection of the remaining axial weld length and 3/4-inch of adjacent base metal as visible from the core side of the shroud on a 10 year frequency; EVT-1s look for evidence of cracking (IASCC) and manage IE.</p> <p><i>40 – 60 Primary Components:</i> The Table 4-1 Item C3 core shroud plates.</p>	Yes	<p><i>60 - 80 Methods and Frequency:</i> Same as those for 40 – 60 in Item C3.1 of Table 4-5 in Rev. 1-A.</p> <p><i>60 – 80 Primary Components:</i> Remains as the Table 4-1 Item C3 core shroud plates.</p>	No	Item C3 Primary core shroud plates are only inspected at the portions of the plate axial weld seams located at the re-entrant corners.	No need to audit this item in Rev. 2.
C3.2 CSA – ribs and rings (CE units with weld core shrouds fabricated with full height shroud plates only)	Yes	<p><i>40 – 60 Methods and Frequency:</i> Ribs and rings are identified as inaccessible components. If expansion is</p>	No	NA	Yes	CSA ribs and rings are not included as assessed components for screening review in Table 3-2 of Rev. 2.	EPRI MRP needs to explain why the CSA ribs and rings were not include as assessed components for screening in Table 3-2 of Rev. 2 and why the Item C3.2 CSA ribs and rings were

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Expansion in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Expansion in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
C3.2 CSA – ribs and rings - Continued (CE units with weld core shrouds fabricated with full height shroud plates only)		triggered, justify by component-specific analysis or replacement activities <i>40 – 60 Primary Components:</i> The Table 4-1 Item C3 core shroud plates.				If EPRI MRP is going to remove the CSA ribs and rings as cited Expansion category components in Rev. 2 they need to be included and assessed in Table 3-2 of Rev. 2.	removed as listed Expansion category components in Table 4-5 of Rev. 2.
Control Element Assembly (CEA)							
C11.1 CEA – remaining (non-peripheral) instrument guide tubes (All CE units with CEA instrument guide tubes)	Yes	<i>40 – 60 Methods and Frequency:</i> If triggered, <i>expanded</i> VT-3 visual inspections of 100% of the accessible non-peripheral CEA instrument guide tubes (minimum 75% population for inspection credit), focusing on the supports and connecting welds. Inspection looks for gross evidence of cracking (SCC, fatigue) that results in missing parts or separation at the weld joints between the tubes and supports <i>40 – 60 Primary Components:</i> The Table 4-1 Item C11 peripheral CEA instrument guide tubes.	Yes	<i>60 - 80 Methods and Frequency:</i> Same as those for 40 – 60 in Item C11.1 of Table 4-5 in Rev. 1-A. <i>60 – 80 Primary Components:</i> Remain as the Table 4-1 Item C11 peripheral CEA instrument guide tubes.	No	No comments.	No need to audit this item in Rev. 2.

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Expansion in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Expansion in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Core Support Barrel Assembly (CSBA) Expansion Category Components							
C5.1 CSBA – lower girth weld (LGW) (All operating CE units)	Yes	40 – 60 <i>Methods and Frequency</i> : If triggered, <i>expanded</i> EVT-1 visual inspections of 100% of the accessible portions (by length) on the OD of the LGW and 3/4-inch of the adjacent base metal. Inspection looks for evidence of cracking (SCC, fatigue) in the weld and manages IE. 40 – 60 <i>Primary Components</i> : The Table 4-1 Item C5 CSBA upper flange weld (UFW).	Yes	60 - 80 <i>Methods and Frequency</i> : Same as those for 40 – 60 in Item C5.1 of Table 4-5 in Rev. 1-A, but only for SCC. Amended to allow for inspection by either EVT-1, eddy current testing (ECT) or volumetric UT 60 – 80 <i>Primary Components</i> : Remain as the Table 4-1 Item C5 CSBA UFW.	Yes	Fatigue removed as a screened in cracking mechanism in Item C5.1 of Rev. 2. Option in Rev. 2 for performing the inspection using either EVT-1, ECT or UT is fine.	Audit to briefly address removal of fatigue as an applicable component-specific cracking mechanism for 60 – 80. Otherwise, no questions for this item in Rev. 2.
C5.2 CSBA – upper girth weld (UGW) (All operating CE units) C5.3 CSBA – upper axial welds (UAWs) (All operating CE units)	Yes	40 – 60 <i>Methods and Frequency</i> : If triggered, <i>expanded</i> EVT-1 visual inspections of 100% of the accessible portions (by length) on one side of the UGW and the UAWs and 3/4-inch of the adjacent weld base metal. Inspection looks for evidence of cracking (SCC,) in the welds and manages IE. 40 – 60 <i>Primary Components</i> : The Table 4-1 Item C5 CSBA upper flange weld (UFW).	Yes	60 - 80 <i>Methods and Frequency</i> : Same as those for 40 – 60 in Items C5.2 and C5.3 of Table 4-5 in Rev. 1-A. Amended to allow for inspection by either EVT-1, eddy current testing (ECT) or volumetric UT 60 – 80 <i>Primary Components</i> : Remain as the Table 4-1 Item C5 CSBA UFW.	No	Option in Rev. 2 for performing the inspection using either EVT-1, ECT or UT is fine.	No need to audit these Items (C5.2 and C5.3) in Rev. 2.

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Expansion in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Expansion in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
<p>C6.1 CSBA – middle axial welds (MAWs) (All operating CE units)</p> <p>C6.2 CSBA – lower axial welds (LAWs) (All operating CE units)</p>	Yes	<p>40 – 60 Methods and Frequency: If triggered, expanded EVT-1 visual inspections of 100% of the accessible portions (by length) of the ODs of the MAWs and the UAWs and ¾-inch of the adjacent weld base metal on a 10-Year inspection frequency. Inspection looks for evidence of cracking (SCC, IASCC) in the welds and manages IE.</p> <p>40 – 60 Primary Components: The Table 4-1 Item C6 CSBA middle girth weld (MGW).</p>	Yes	<p>60 - 80 Methods and Frequency: Same as those for 40 – 60 in Items C6.1 and C6.2 of Table 4-5 in Rev. 1-A. Amended to allow for inspection by either EVT-1, eddy current testing (ECT) or volumetric UT</p> <p>60 – 80 Primary Components: Remain as the Table 4-1 Item C6 CSBA MGW.</p>	Yes	<p>MRP-2019-023 and 2019-009 called for a one-time VT-3 visual of the CSBA MAWs and LAWS (based on the St. Lucie MAW).</p> <p>St. Lucie operating experience with CSBA MAW cracking needs to be discussed during the audit.</p>	<p>St. Lucie operating experience and MRP-2019-023 criteria relationships need to be discussed relative to the revised versions of Item C6.1 and C6.2 in Rev. 2.</p>
<p>C5.5 CSBA flexure weld (All CE plants with welded core shrouds including those with full height plats and plates in two vertical CSBA sections)</p>	No	NA	Yes	<p>60 - 80 Methods and Frequency: If the flexure weld is placed in as an Expansion category weld (instead of Primary) and expansion is triggered, expanded EVT-1, ECT, or UT inspection of 100% of the accessible portions (by length) of the OD of the flexure weld and ¾-inch of the adjacent weld base metal on a 10-Year inspection frequency. Inspection looks for</p>	Yes	<p>For 40 – 60 in Rev. 1-A, the CSBA flexure weld (a type of circumferential flange weld) is either a Primary or NAM category component, depending on the component-specific fatigue and SCC screening results for the weld type.</p> <p>For 60 - 80 in Rev. 2, the CSBA flexure weld is either a Primary or Expansion category component, depending on the component-specific fatigue and SCC screening results</p>	<p>Audit only to confirm that both fatigue and SCC screening is needed for SLR, and that the results of the fatigue and SCC screening analysis will place the flexure weld in as Primary if the components screens in for either fatigue or SCC (and that, if Primary, the weld is covered by Item C7 in Table 4-2 of MRP-227, Rev. 2).</p> <p>NOTE: For current St. Lucie SLRA review the CSBA flexure weld did not screen in for either SCC or fatigue, so the applicant justified its basis for placing the CSBA flexure weld in as an Expansion category component</p>

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Expansion in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Expansion in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
C5.5 CSBA flexure weld - Continued (All CE plants with welded core shrouds including those with full height plats and plates in two vertical CSBA sections)				evidence of cracking (SCC) in the welds and manages IE. <i>60 - 80 Primary Components:</i> If the CSBA flexure weld is placed in as an Expansion category weld, the corresponding Primary weld is the Table 4-1 Item C5 CSBA UFW.		for the weld type through an 80-year periodicity assessment. Thus, Item C5.5 in Table 4-5 of MRP-227, Rev. 2 should only apply and designate the flexure weld as an Expansion category weld type for the program if the fatigue and SCC screening analysis basis for the flexure weld does not screen it in for either SCC or fatigue through an 80-year assessment period.	
Lower Support Structure (LSS) Expansion Category Components							
C5.4 LSS – lower core support beams (CE units with weld core shrouds made from full height shroud plates only)	Yes	<i>40 – 60 Methods and Frequency:</i> If triggered, <i>expanded</i> EVT-1 visual inspections of 25% of the support beam welds and 3/4-inch of the adjacent weld base metal (or as justified by analysis). Inspection looks for evidence of cracking (SCC, fatigue), including damaged or fractured material. <i>40 – 60 Primary Components:</i> The Table 4-1 Item C5 CSBA UFW.	Yes	<i>60 - 80 Methods and Frequency:</i> Same as those for 40 – 60 in Item C5.4 of Table 4-5 in Rev. 1-A. <i>60 – 80 Primary Components:</i> Remains as the Table 4-1 Item C5 CSBA UFW.	No	No comments.	No need to audit this item in Rev. 2.

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Expansion in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Expansion in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
C6.3 LSS – core support columns (CE units with welded core shrouds made from full height shroud plates only)	Yes	<i>40 – 60 Methods and Frequency:</i> If expansion is triggered, expanded VT-3 visual inspections of 25% of the total number of column/column weld in the column assemblies from above the core support plate, with the inspection to be evenly distributed. Inspection looks for evidence of cracking (SCC, IASCC, fatigue) on a 10-Year frequency and manages IE and thermal embrittlement (TE). <i>40 – 60 Primary Components:</i> The Table 4-1 Item C6 CSBA middle girth weld (MGW).	Yes	<i>60 – 80 Methods and Frequency:</i> Same as those for 40 – 60 in Item C6.3 of Table 4-5 in Rev. 1-A as <i>60 – 80 Primary Components:</i> Remains as the Table 4-1 Item C6 CSBA MGW.	No	No comments.	No need to audit this item in Rev. 2.
Upper Internals Assembly (UIA) Expansion Category Components							
C6.4 UIA Fuel Alignment Plate (CE units with welded core shrouds using two vertical sections only)	No	NA	Yes	<i>60 – 80 Methods and Frequency:</i> If expansion is triggered, expanded VT-3 visual inspections of a minimum 25% of the core side plate surfaces. Inspection looks for evidence of cracking (IASCC) on a 10-Year frequency and manages IE.	No	New Expansion category component for SLR. No questions.	No need to audit this item in Rev. 2.

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Expansion in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Expansion in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
C6.4 UIA Fuel Alignment Plate - Continued (CE units with welded core shrouds using two vertical sections only)				60 – 80 Primary Components: The Table 4-1 Item C6, CSBA MGW.			

TABLE #CE3 NOTES:

- The staff has screened audit needs for the specified MRP-227, Rev. 2 Table 4-5 inputs in accordance with the following color coded basis: (1) **Blue** highlighted text – specified Expansion category component type does not need to be subject to an audit review for the component-specific inspection result basis in Table 4-5 of MRP-227, Rev. 2; (2) **Yellow** highlighted text – specified Expansion category component type is subject to a limited audit review for the inspection result basis but only to confirm the same inspection results (including the Primary component link basis) in Table 4-5 of MRP-227, Rev. 1-A can carry forward as the component-specific inspection result basis in Table 4-5 of MRP-227, Rev. 2; and (3) **Green** highlighted text – inspection basis (including Primary component link basis) for the specified Expansion category component type in Table 4-5 of MRP-227, Rev. 2 needs to be subject to more detailed audit discussions, included any applicable item-specific Note bases that apply to the component type in Table 4-5 of MRP-227, Rev. 2.

IV. AUDIT TABLE #CE4 - ASSESSED MRP-227 CHAPTER 4, TABLE 4-8 CE COMPONENT COMPARISONS – CE EXISTING PROGRAM CATEGORY COMPONENTS – INSPECTION RESULT CRITERIA REVISIONS IN REV. 2¹

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Existing Program in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Existing Program in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Core Shroud Assembly (CSA) Existing Program Components							
C13 CSA guide lugs (All CE units)	Yes	<i>40 – 60 Methods and Frequency:</i> ASME Section XI VT-3 visual inspections per frequency specified in Table IWB-2500-1, for applicable B-N-2 or B-N-3 Examination Category criteria. VT-3s look for general evidence of excessive or asymmetrical wear occurring in the lugs. Coverage is accessible component surfaces at specified ASME Section XI frequency (normally once every 10 years).	Yes	<i>60 – 80 Methods and Frequency:</i> Same as those for 40 – 60 in Item C13 in Table 4-8 of Rev.1-A	No	None	Audit of this item is unnecessary. Not questions.
Upper Internals Assembly (UIA) Existing Program Components							
C14 UIA guide lug inserts and bolts (All CE units)	Yes	<i>40 – 60 Methods and Frequency:</i> ASME Section XI VT-3 visual inspections per frequency specified in Table IWB-2500-1, for applicable B-N-2 or B-N-3 Examination Category criteria. VT-3s look for general evidence of excessive or asymmetrical wear occurring in the lugs inserts and bolts. Coverage is accessible	Yes	<i>60 – 80 Methods and Frequency:</i> Same as those for 40 – 60 in Item C14 in Table 4-8 of Rev.1-A	No	None	Audit of this item is unnecessary. Not questions.

EPR1 MRP Expansion Item No. Designation And Component/Scope of Units	Included as Existing Program in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Existing Program in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
C14 UIA guide lug inserts and bolts - Continued (All CE units)		component surfaces at specified ASME Section XI frequency (normally once every 10 years).					
Core Barrel Assembly (CBA) Existing Program Components							
C16 CBA upper flange (All CE units)	Yes	<i>40 – 60 Methods and Frequency:</i> ASME Section XI VT-3 visual inspections per frequency specified in Table IWB-2500-1, for applicable B-N-2 or B-N-3 Examination Category requirements. VT-3 visuals are used to manage loss of material due to wear in the upper flange.	Yes	<i>60 – 80 Methods and Frequency:</i> Same as those for 40 – 60 in Item C16 in Table 4-8 of Rev.1-A.	Yes	For the “Examination Method” column entry of Item C16, why doesn’t the updated version the line item provide a more detailed description of the types of component conditions the VT-3 examinations be used for monitor for, as related to managed of loss of material due to wear? Coverage criterion in Item C16 for the “Examination Coverage” column entry of the line item is the “area of the upper flange potentially susceptible to wear.”	Is a more detailed “Examination Method” column entry for Item C16 warranted for Item B16 in Table 4-8 of Rev. 2? Coverage criterion needs to be better defined. For the stated coverage criterion, the EPR1 MRP should be prepared to define and explain which portions, subcomponents, or regions in the CBA upper flange are potentially susceptible to wear mechanism.
Lower Support Structure (LSS) Existing Program Components							
C15.a LSS fuel alignment pins (Fuel pins in CE units designed with welded core shrouds fabricated from full height shroud plates)	Yes	<i>40 – 60 Methods and Frequency:</i> ASME Section XI VT-3 visual inspections per frequency specified in Table IWB-2500-1, for applicable B-N-2 or B-N-3 Examination Category criteria. VT-3s look for evidence of severed alignment pins, missing locking tabs, or excessive wear in the alignment pin	Yes	<i>60 – 80 Methods and Frequency:</i> Same as those for 40 – 60 in Item C15.a in Table 4-8 of Rev.1-A.	No	None	Audit of this item is unnecessary. No questions.

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Existing Program in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Existing Program in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
C15.a LSS fuel alignment pins - Continued (Fuel pins in CE units designed with welded core shrouds fabricated from full height shroud plates)		nose or flange that may be indicative of cracking (SCC or fatigue), loss of preload (ISR/IC) or irradiation embrittlement (IE) occurring in the pins or the assemblies secured by the pints.					
C15.b LSS fuel alignment pins (Fuel pins in CE units designed with welded core shrouds fabricated in two vertical shroud cylinder sections)	Yes	40 – 60 Methods and Frequency: ASME Section XI VT-3 visual inspections per frequency specified in Table IWB-2500-1, for applicable B-N-2 or B-N-3 Examination Category criteria.	Yes	60 – 80 Methods and Frequency: Same as those for 40 – 60 in Item C15.b in Table 4-8 of Rev.1-A.	Yes	Why doesn't the "Examination Method" column entry for Item C15.b in Table 4-8 of MRP-227, Rev. 2 include the same type of information that was provided for Item C15.a in the same table?	EPRI MRP should clarify why the "Examination Method" column entry for Item C15.b in Table 4-8 of Rev. 2 does not include the same information for Item C15.b as were provided in the "Examination Method" column entry for Item C15.a of the same table.
Alignment and Interfacing Existing Program Components							
C17 Core stabilizing lugs and shims (and bolts in Rev. 2) (All CE units)	Yes	40 – 60 Methods and Frequency: ASME Section XI VT-3 visual inspections per frequency specified in Table IWB-2500-1, for applicable B-N-2 or B-N-3 Examination Category criteria, as supplemented in the guidance in Westinghouse Technical Bulletin (TB) 14-5.	Yes – but with core stabilizing bolts added in for Item C17 in Table 4-8 of Rev. 2	60 – 80 Methods and Frequency: Same as those for 40 – 60 in Item C17 in Table 4-8 of Rev.1-A, but adds in UT volumetric technique as an inspection option per the guidance in OG-21-160.	Yes	Westinghouse Technical Bulletin TB 14-5 applies. OG-21-160 is a new guidance document; the staff has no familiarity with this guidance document.	EPRI MRP should be prepared to discuss the two guidance documents that relate to Item C17 in Table 4-8 of Rev. 2; including discussions on when it would be appropriate to select UT as the applicable inspection method of the VT-3 inspections called out by the ASME Section XI code (as supplemented by TB 14-5). EPRI MRP should identify which industry organization issued OG-21-160 and be prepared to indicate whether TB 14-5 and OG-21-160 has been docketed (for information) with the NRC.

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Existing Program in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Existing Program in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Top Mounted Incore Instrument (ICI) Existing Program Components							
C20 ICI thimble tubes – lower (All CE units with top-mounted ICI)	No	NA	Yes	60 – 80 Methods and Frequency: Unspecified in new Item C20 of Table 4-8 in MRP-227, Rev. 2. New C20 line item only indicates management of irradiation growth will be performed in accordance with a plant-specific program and that the examination method will be established by the plant-specific program (including updates of the plant-specific SLR operations.	Yes	This is a new line item for specific types of CE-design PWR units in Table 4-8. Not quite which of the current operating CE units this line item is applicable to. Current operating CE units are down to only the following seven units: (1) Millstone Unit 2, (2) St. Lucie Units 1 and 2, (3) Waterford Unit 3, (4) Palo Verde Units 1, 2, and 3.	EPRI MRP should be prepared to discuss which of these CE-designed units have top-mounted ICI and what the EPRI MRP did to confirm that the licensee's owning the units have the site-specific or unit-specific program in place for managing irradiation-enhanced crack growth in the ICI thimble tubes – lower. EPRI MRP should also be prepared to discuss which type of plant-specific programs are being referred to here. Is it a condition monitoring program or performance monitoring program as defined in Appendix A.1 of the SRP-SLR report (NUREG-2192).

TABLE #CE4 NOTES:

- The staff has screened audit needs for the specified MRP-227, Rev. 2 Table 4-8 inputs in accordance with the following color coded basis: (1) Blue highlighted text – specified Expansion category component type does not need to be subject to an audit review for the component-specific inspection result basis in Table 4-8 of MRP-227, Rev. 2; (2) Yellow highlighted text – specified Expansion category component type is subject to a limited audit review for the inspection result basis but only to confirm the same inspection results (including the Primary component link basis) in Table 4-8 of MRP-227, Rev. 1-A can carry forward as the component-specific inspection result basis in Table 4-8 of MRP-227, Rev. 2; and (3) Green highlighted text – inspection basis (including Primary component link basis) for the specified Expansion category component type in Table 4-8 of MRP-227, Rev. 2 needs to be subject to more detailed audit discussions, included any applicable item-specific Note bases that apply to the component type in Table 4-8 of MRP-227, Rev. 2.

V. AUDIT TABLE #CE5 - ASSESSED MRP-227 CHAPTER 5, TABLE 5-2 CE COMPONENT COMPARISONS – CE PRIMARY CATEGORY COMPONENT ACCEPTANCE CRITERIA REVISIONS IN REV. 2¹

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
Core Shroud Assembly (CSA) Component Acceptance Criteria							
C1 Core shroud bolts (CE units with bolted core shroud assemblies only)	Yes	<p><i>40 – 60 Method:</i> UT of the core shroud bolts</p> <p><i>40 – 60 Expansion linked components:</i> Item C1.1, core support column bolts (primary Expansion bolting type; Item C1.2 barrel-shroud bolts (secondary Expansion bolt type)</p> <p><i>40 – 60 Relevant Condition (applies to Primary, first Expansion, and secondary Expansion bolt types):</i> The examination acceptance criteria for the bolts types shall be established as part of the examination technical justification. Detection of a flaw (as characterized by the technical justification) shall be cause for rejection of the bolt.</p>	No	NA	Yes	Item C1 removed from scope of Table 5-2 in Rev. 2	Audit only to confirm that Item C1 only applied to the CE units at Ft. Calhoun and Palisades stations and that both unit have gone into at least permanent non-power operating conditions.
C2 CSA Core shroud plate-to-former plate welds (CE units with welded core shroud assemblies in two vertical sections only)	Yes	<p><i>40 – 60 Method:</i> EVT-1 of the core shroud core shroud plate-to-former plate welds and adjacent base metal at the shroud re-entrant corners</p> <p><i>40 – 60 Expansion linked components:</i></p>	Yes	<i>60 – 80, Method, Expansion components, and criteria:</i> Same as those for 40 – 60 in Item C2 of Table 5-2, MRP-227, Rev. 1-A.	No	No comments	No reason to audit updated version of Item C2 in Table 5-2 of Rev. 2

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
<p>C2 CSA Core shroud plate-to-former plate welds - Continued</p> <p>(CE units with welded core shroud assemblies in two vertical sections only)</p>		<p>Item C2.1, remaining CSA axial welds</p> <p><i>40 – 60 Relevant Condition (applies to Primary, and Expansion weld types):</i> The relevant condition for both the Primary and Expansion category type welds is detection of a surface-breaking crack-like conditions. Detection of a surface-breaking flaw in excess of 2 inches in length and sized in the core shroud plate-to-former plate weld at the reentrant corners (within 6 inches of the central flange and horizontal stiffeners) shall require inspections of the remaining welds by completion of the next refueling outage.</p>					
<p>C3 CSA – shroud plates</p> <p>(CE units with welded core shroud assemblies using full height shroud plates only)</p>	Yes	<p><i>40 – 60 Method:</i> EVT-1 visual of the shroud plate welds.</p> <p><i>40 – 60 Expansion linked components:</i> Item C3.1, remaining CSA axial welds (primary Expansion weld type; Item C3.2 CSA ribs and rings (secondary Expansion component type – per EPRI MRP, inaccessible to inspection)</p>	Yes	<p><i>60 – 80, Method, Expansion components, and criteria:</i> Same as those for 40 – 60 in Item C2 of Table 5-2, MRP-227, Rev. 1-A, with the exception of the bases for dispositioning expansion to the CSA ribs and rings was removed in Item C3 of Table 5-2, MRP-227, Rev. 2.</p>	Yes	<p>CSA ribs and rings removed as Expansion category components for the CSA shroud plates in Rev. 2.</p>	<p>Same issue as for Item C3.2 in Audit Topic Table CE3. EPRI MRP removed the CSA secondary Expansion level components for the Primary shroud plates in Rev. 2 without a screening assessment for the CSA ribs and rings in Table 3-2 of Rev. 2.</p>

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
		<p><i>40 – 60 Relevant Condition (applies to Primary and first Expansion, weld type):</i> The relevant condition is a detected surface breaking crack-like indication. The examination acceptance criteria for the Primary weld inspections is that confirmation of a surface-breaking flaw indication in excess of 2 inches in length in the shroud plate-to-former plates welds at the reentrant corners requires expanded inspections of all remaining axial welds seams by completion of the next refueling outage. Detection of extensive cracking in the remaining axial welds requires disposition of the associated ribs and rings either by component-specific analysis or by component replacement activities.</p>					
C4. CSA - assembly	Yes	<p><i>40 – 60 Method:</i> VT-3 visual inspection of the CSA assembly in units</p>	No	NA	Yes	Item C4 removed form	Audit only to confirm that Item C4 only applied to

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
(CE units with bolted core shroud assemblies only)		with bolted shroud designs <i>40 – 60 Expansion linked components:</i> None <i>40 – 60 Relevant Condition:</i> The relevant conditions is detection of abnormal interact with the fuel assemblies, gaps along high fluence bolted shroud plate joints, or vertical displacement of the shroud plates near high fluence joints.				scope of Table 5-2 in Rev. 2	the CE units at Ft. Calhoun and Palisades stations and that both unit have gone into at least permanent non-power operating conditions.
C4.a. CSA - assembly (CE units with welded core shroud assemblies in two vertical sections only)	Yes	<i>40 – 60 Method:</i> VT-1 visual inspection of the CSA assembly in units with welded shroud designs in two vertical sections (e.g., those in the St. Lucie units) <i>40 – 60 Expansion linked components:</i> None <i>40 – 60 Relevant Condition:</i> The relevant condition is detected evidence of physical separation between the upper and lower core shroud sections.	Yes	<i>60 – 80, Method, Expansion components, and criteria:</i> Same as those for 40 – 60 in Item C4.a of Table 5-2, MRP-227, Rev. 1-A	No	No comments.	Audit of this item is un-necessary. No questions.
C18 CSA – core shroud tie rods and nuts	No	NA	Yes	<i>60 – 80 Method:</i> Non-qualified visual inspection of the tie rods and nuts.	Yes	This was included as a conservative gap analysis change for the	Use of non-qualified visual inspection methods needs to be discussed with

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
(All CE units with core shroud tie rods and nuts)				<i>60 – 80 Relevant Condition:</i> Visual methods look for broken locking tabs, missing nuts, displaced tie rods, or evidence of wear in the tie rod assemblies; no Expansion components		Reactor Vessel Internals Program that was included in the St. Lucie SLRA	EPRI MRP on a generic basis.
Core Shroud Barrel Assembly (CSBA) Component Acceptance Criteria							
C5 CSBA upper flange weld (UFW) (all operating CE units)	Yes	<p><i>40 – 60 Method:</i> EVT-1 visual inspection of the UFW</p> <p><i>40 – 60 Expansion linked components:</i> (1) Item C5.1, CSBA lower girth weld (LGW), (2) Item C5.2, CSBA upper girth weld (UGW), (3) Item C5.3, CSBA upper axial welds (UAWs), and (4) Item C5.4, lower support structure (LSS) lower core support beams</p> <p><i>40 – 60 Relevant Condition:</i> <i>40 – 60 Relevant Condition (applies to Primary and first Expansion, weld type):</i> The relevant condition is a detected surface breaking crack-like indication. The examination acceptance criteria for the Primary weld inspections is that confirmation of a surface-breaking flaw indication in excess of 2 inches in the UFW requires expanded</p>	Yes	<p><i>60 – 80, Method, Expansion components, and criteria:</i> Same as those for 40 – 60 in Item C5 of Table 5-2, MRP-227, Rev. 1-A, with the exception of the addition of the Item C5.5 CSBA flexure welds as a potential additional Expansion component type for the CSBA UFW and that the inspection can be performed using EVT-1, ECT, or UT inspection techniques.</p> <p>If <i>expansion</i> is triggered to the CSBA flexure weld, the expansion basis for performing an <i>expanded</i> inspection in the CSBA flexure weld is the same as that for performing the expanded inspections of the Item C5.4 LSS lower core support beams (i.e., complete the expansion inspection of the flexure weld within the next three refueling outages).</p>	Yes	<p>Item C5.5 CSBA flexure weld not listed in Rev. 1-A as a potential Expansion component for the CSBA UFW due to the placement of the flexure weld in the NAM category if the flexure weld did not screen in for both SCC and fatigue by the component-specific screening analysis for 60 years.</p> <p>If the CSBA flexure weld screens in for either fatigue or SCC for the 80-year screening assessment, the flexure weld is identified as a Primary category weld</p>	Limited audit needed only to confirm that the inspections of the CSBA UFW would not potentially expand to the CSBA flexure weld if the flexure weld screened in for either fatigue or SCC for the 80-year assessment and the CSBA flexure weld was categorized as a Primary weld component per Item C7 in Tables 4-2 and 5-2 of MRP-227, Rev. 2.
C5 CSBA upper flange weld (UFW) - Continued							

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
(All operating CE units)		<p>viewed from above the column is the detection of missing or separated welds, or fractured, misaligned, or missing columns.</p> <p>The examination acceptance criteria for the Primary weld inspection is that confirmation of a surface-breaking flaw indication in excess of 2 inches in the MGW requires expanded inspections of the CSBA MAWs and LAWs and 25% of the core support columns by the next refueling outage. If the defined relevant conditions for columns in plants with full height core shrouds or for columns in units with welded shrouds in two vertical sections are detected in the columns, the inspection expand to the accessible portions of remaining 75% population of the columns in the units.</p>				5-2 of MRP-227, Rev. 2. This should only apply to units welded core shrouds utilizing full height shroud plates.	
C7 CSBA flexure weld (All operating CE units with a welded core)	Yes	40 – 60 Method: EVT-1 visual inspection of the CSBA flexure weld	Yes	60 – 80, Method, Expansion components, and criteria: Same as those for 40 – 60 in Item C7 of Table 5-2,	Yes	See comments on Item C5 in this table	Limited audit to confirm that Item C7 only applies if the CSBA flexure weld screens in for

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
(All CE units with instrument guide tubes in the CEAs)		by completion of the next refueling outage.					
C19 CEA shroud bolts (All CE units with CEA shroud bolts)	No	NA	Yes	<p><i>60 – 80 Method:</i> UT volumetric inspection of the CEA shroud bolts</p> <p><i>60 – 80 Expansion linked components:</i> Item C11.1, remaining (i.e., non-peripheral) CEA instrument guide tubes</p> <p><i>60 – 80 Relevant Condition:</i> Relevant condition or conditions to be established as part of a plant-specific technical justification.</p>	Yes	<p>This is a new item for SLR periods. Which remaining U.S. operating CE units does this new line item apply to? Is it limited to only those with a bolted core shroud design?</p> <p>Component type is not yet covered by an approved version of WCAP-17096 (i.e., Rev. NP-A, 2) or even in the pending WCAP-17096, Rev. 3 version.</p>	If this is limited only to Ft. Calhoun and Palisades units, why is this item necessary?
Upper Internals Assembly (UIA) Component Acceptance Criteria							
C10 UIA fuel alignment plate (CE units with welded core shrouds utilizing full height plates only) C10 UIA fuel alignment plate - Continued	Yes	<p><i>40 – 60 Method:</i> EVT-1 visual inspection of the UIA fuel alignment plate</p> <p><i>40 – 60 Expansion linked components:</i> None</p> <p><i>40 – 60 Relevant Condition:</i> The relevant condition is a detectable surface breaking crack-like flaw indication.</p>	Yes	<p><i>60 – 80, Method, Expansion components, and criteria:</i> Same as those for 40 – 60 in Item C10 of Table 5-2, MRP-227, Rev. 1-A</p>	Yes	See comments on Item C6 in this table	Limited audit to confirm that Item C10 only applies if the UIA fuel alignment plate screens in for fatigue on the needed 80-year screening assessment; otherwise the UIA fuel alignment plate is an Expansion category plate per Item C6.4. Also

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
(CE units with welded core shrouds utilizing full height plates only)							EPRI MRP to help clarify which remaining operating CE units have the UIA fuel alignment plates.
Lower Support Structure (LSS) Components Acceptance Criteria							
C9 LSS core support plate (All CE units with a core support plate)	Yes	<p><i>40 – 60 Method:</i> EVT-1 visual inspection of the LSS core support plate</p> <p><i>40 – 60 Expansion linked components:</i> None</p> <p><i>40 – 60 Relevant Condition:</i> The relevant condition is a detectable surface breaking crack-like flaw indication.</p>	Yes	<p><i>60 – 80, Method, Expansion components, and criteria:</i> Same as those for 40 – 60 in Item C9 of Table 5-2, MRP-227, Rev. 1-A</p>	Yes	See comments on Item C6 in this table	Limited audit to confirm that Item C9 only applies if the LSS core support plate screens in for fatigue on the needed 80-year screening assessment; otherwise the LSS core support plate is an Expansion category plate per Item C6.3. Also EPRI MRP to help clarify which remaining operating CE units have the LSS core support plate.
C12 LSS deep beams (CE units with welded core shrouds utilizing full height plates only)	Yes	<p><i>40 – 60 Method:</i> EVT-1 visual inspection of 25% if the LSS deep beams</p> <p><i>40 – 60 Expansion linked components:</i> Remaining (75% population) of LSS deep beams.</p> <p><i>40 – 60 Relevant Condition (for both Primary and Expansion category LSS deep beams):</i> The relevant</p>	Yes	<p><i>60 – 80, Method, Expansion components, and criteria:</i> Same as those for 40 – 60 in Item C9 of Table 5-2, MRP-227, Rev. 1-A</p>	Yes	No comments.	Only to find out if there are any special consideration on which deep beams will be selected for the original 25% Primary population of beams versus the 75% population for the beams that are set as Expansion category components.

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
		condition is a detectable surface breaking crack-like flaw indication. Confirmed evidence of a crack-like indication in one or more of the Primary category deep beams requires the inspections to be expanded to the remaining deep beams by completion of the next refueling outage.					

TABLE #CE5 NOTES:

- The staff has screened audit needs for the specified MRP-227, Rev. 2 Table 5-2 inputs in accordance with the following color coded basis: (1) **Blue** highlighted text – specified acceptance criteria basis for specified Primary and Expansion category component types in Table 5-2 of the MRP-227 Rev. 1-A or Rev. 2 versions does not need to be subject to an audit review for the component-specific basis in Table 5-2 of MRP-227, Rev. 2; (2) **Yellow** highlighted text – specified acceptance criteria basis for specified Primary and Expansion category component types in Table 5-2 of the MRP-227 Rev. 1-A or Rev. 2 versions is subject to a limited audit review for the inspection result basis but only to confirm the same inspection criteria for the specified Primary and Expansion components types can carry forward as the acceptance criteria basis in Table 5-2 of MRP-227, Rev. 2; and (3) **Green** highlighted text – the specified acceptance criteria basis for specified Primary and Expansion category component types in Table 5-2 of MRP-227, Rev. 2 needs to be subject to more detailed audit discussions, included any applicable item-specific Note bases that apply to the component type in Table 5-2 of MRP-227, Rev. 2.

ENCLOSURE 5

WESTINGHOUSE DESIGN-SPECIFIC AUDIT TOPICS

FOR TABLES 3-3, 4-3, 4-6, 4-9, AND 5-3 IN MRP-227, REV. 2

The component-specific line items in the tabular audit discussion tables in this enclosure are color coded as follows in order to convey whether the component-specific topics warrant audit discussions, and if so, the degree of audit discussions that are merited on the component-specific audit topic: (1) **blue** color highlighted content conveys the component-specific topic does not need to be included in audit discussions, (2) **yellow** color highlighted content conveys the component-specific topic warrants some limited audit discussion, and (3) **green** color highlighted content conveys the component-specific topic warrants more detailed audit discussions.

I. AUDIT TABLE #W1 - ASSESSED MRP-227 CHAPTER 3, TABLE 3-2 WESTINGHOUSE (W)-DESIGN COMPONENT COMPARISONS – W-DESIGN COMPONENTS SUBJECT TO AUDIT FOR SCREENING OR CATEGORIZATION RESULTS

Assembly/Component Description ¹	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Control Rod Guide Tube (CRGT) Assembly Component Screening and Categorization Results							
CRGT assembly lower flanges	Yes	P	Yes	P or E	Yes	<p>This may be a downgrade in the listed inspection category basis for the component type in Table 3-3 of Rev. 2.</p> <p>Also why isn't this a single screening item for the CRGT peripheral lower flange welds (LFWs) are Primary components and another single screening item for the remaining (non-peripheral) CRGT LFWs. That is, the line item for the CRGT lower flanges in Table 3-1 does not stack up with the line items for CRGT LFW types in Tables 4-3 and 4-6 of MRP-227, Rev. 2.</p>	An audit discussion will definitely be necessary for the updated screening basis for the CRGT lower flange components. Specifically, the inspection categorization for the component type can now be Primary or Expansion (P or E) category; thus, for SLR this implies that the CRGT assembly lower flanges need to be subject to an 80-year plant-specific screening analysis to establish which inspection category the lower flanges will be assigned to the components. But the EPRI MPR does not define which types of aging mechanisms need to be screened for the inspection categorization screening determination. EPRI MRP needs to justify this change (probably in response to an RAI).
CRGT guide plates (guide cards)	Yes	P	Yes	X	No	<p>For Rev. 2, now putting the CRGT components in as existing program components per WCAP-17451 guidelines. The staff looks at WCAP-17451 (latest version) criteria for the CRGT components through its review of WCAP-17096 versions that are submitted for staff review by the PWROG. Thus, Existing Program is the more appropriate category for the CRGT components.</p>	No audit of the revised screening basis for the component type is necessary. Existing Program (i.e., "X", as tied to latest version of WCAP-17451) is the more appropriate inspection category for the referenced CRGT guide card component type.
CRGT C-tubes	Yes	N	Yes	X	No	<p>See comment for CRGT guide cards above.</p>	No audit of the revised screening basis for the component type is necessary. X (tied to latest version of WCAP-17451) is the more appropriate inspection category for the referenced CRGT component type.
CRGT sheaths	Yes	N	Yes	X	No	<p>See comment for CRGT guide cards above.</p>	No audit of the revised screening basis for the component type is necessary. X (tied to latest version of WCAP-17451) is the more

Assembly/Component Description ¹	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
							appropriate inspection category for the referenced CRGT component type.
CRGT support pins	Yes	X	Yes	X	Yes	Section 4.5 states that upper internals guide tube support pins (split pins) are not a safety issue and does not require an aging management program. But EPRI MPR leaves the CRGT split pins in as Existing Program components in Table 3-2 of MRP-227, Rev. 2, even though Table 4-9 in MRP-227, Rev. 2 does not include a line item for the CRGT support pins (split pins). Thus, the report contradicts itself.	EPRI MPR needs to address and reconcile the inconsistency between the Section 4.5 statement of the split pins, the Existing Program ("X") inspection categorization for the split pins in Table 3-2, and the lack of a line item for the CRGT split pins in Table 4-9 of the report. Additionally, what type of plant-specific program is being applied here if aging management is still necessary (ASME Section XI, WCAP type program, PWROG report type program, etc.)? Are the CRGT split pins within the scope of WCAP-17451-P, Rev. 1? Thus, detailed audit discussions of the CRGT split pins bases are necessary for the MRP-227, Rev. 2 review.
Upper Internals Assembly (UIA) Component Screening and Categorization Results³							
Upper support ring or skirt	Yes	X	Yes	X	No	Using ASME BPV Code Section XI VT-3 visual inspection criteria as the Existing Program (X) category basis for the components type in Table 4-9 of Rev. 2.	No audit of the screening basis for the component type is necessary. Existing Program using the ASME Section XI inspection methods is an acceptable inspection category for the referenced component type.
UIA fuel alignment pins	No	NA	Yes	X	No	Using ASME BPV Code Section XI VT-3 visual inspection criteria as the Existing Program (X) category basis for the components type. I think this change came from MRP 2018-022.	No audit of the screening basis for the component type is necessary. Existing Program using the ASME Section XI inspection methods is an acceptable inspection category for the referenced component type.
Protective skirt bolts	No	NA	Yes	NAM	Yes	This is a new screening line item for the referenced component type in Table 3-3 in Rev. 2. Audit discussions will be necessary on component intended function and potential for failure to impact safety-related components. This also falls into the generic logistics issue as to why this component types was not listed and included for screening in Table 3-3 of MRP-227, Rev. 1-A. ⁵	NAM category basis for this component type needs to be audited and discussed. Additionally, EPRI MPR needs to address logistics issue on not having a line item-based screening assessment for this component type in Table 3-3 of MRP-227, Rev. 1-A; See explanation in table Note 5.
Upper core plate (UCP)	Yes	E	Yes	E	Yes	In comparison to the inspection category (i.e., "X") for the UCP	Basis for keeping the final inspection category of the UCP as Expansion ("E") category for

Assembly/Component Description ¹	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
UCP - Continued						insert in the line item below, the final inspection category for the UCP is still Expansion category in Table 3-2 of Rev. 2. But the linked ASME BVP Code Section XI inspections would not be limited to only the UCP insert. Thus, why hasn't the inspection category been revised to "X"?	the component types needs to be audited and discussed with EPRI MRP and Westinghouse.
UCP insert	No	NA	Yes	X	No	Using ASME BPV Code Section XI VT-3 visual inspection criteria as the Existing Program (X) category basis for the components type. I think this change came from MRP 2018-022.	No audit of the screening basis for the component type is necessary. Existing Program using the ASME Section XI inspection methods is an acceptable inspection category for the referenced component type.
UIA instrument brackets, clamps, terminal blocks, and conduit stops	No	NA	Yes	NAM	Yes	This is a new screening line item for the referenced component type in Table 3-3 in Rev. 2. Audit discussions will be necessary on component intended function and potential for failure to impact safety-related components. This also falls into the generic logistics issue as to why this component types was not listed and included for screening in Table 3-3 of MRP-227, Rev. 1-A. ⁵	NAM category basis for this component type needs to be audited and discussed. Additionally, EPRI MRP needs to address logistics issue on not having a line item-based screening assessment for this component type in Table 3-3 of MRP-227, Rev. 1-A; See explanation in table Note 5.
Conduit seal assembly body, tubesheets, and tubesheet welds	No	NA	Yes	NAM	Yes	This is a new screening line item for the referenced component type in Table 3-3 in Rev. 2. Audit discussions will be necessary on component intended function and potential for failure to impact safety-related components. This also falls into the generic logistics issue as to why this component types was not listed and included for screening in Table 3-3 of MRP-227, Rev. 1-A. ⁵	NAM category basis for this component type needs to be audited and discussed. Additionally, EPRI MRP needs to address logistics issue on not having a line item-based screening assessment for this component type in Table 3-3 of MRP-227, Rev. 1-A; See explanation in table Note 5.
Conduit seal assembly tubes	No	NA	Yes	NAM	Yes	This is a new screening line item for the referenced component type in Table 3-3 in Rev. 2. Audit discussions will be necessary on component intended function and potential	NAM category basis for this component type needs to be audited and discussed. Additionally, EPRI MRP needs to address logistics issue on not having a line item-based screening assessment for this component

Assembly/Component Description ¹	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Conduit seal assembly tubes - Continued						for failure to impact safety-related components. This also falls into the generic logistics issue as to why this component types was not listed and included for screening in Table 3-3 of MRP-227, Rev. 1-A. ⁵	type in Table 3-3 of MRP-227, Rev. 1-A; See explanation in table Note 5.
Baffle-Former Assembly Component Screening and Categorization Results							
Baffle edge bolts	Yes	P	Yes	P	No	No comments.	No audit of the screening basis for the component type is necessary. The component type remains a Primary category component for the program.
Baffle plates and former plates	Yes	P	Yes	P	No	No comments	No audit of the screening basis for the component type is necessary. The component type remains a Primary category component for the program.
Baffle-to-former (BF) bolts	Yes	P	Yes	P	No	No comments	No audit of the screening basis for the component type is necessary. The component type remains a Primary category component for the program.
Core barrel-to-baffle (CB) bolts	Yes	E	Yes	E	No	No comments	No audit of the screening basis for the component type is necessary. The component type remains an Expansion category component for the program.
Bracket bolts	No	N/A	Yes	P	Yes	The staff has no issue with the placement of the bracket bolts into the Primary inspection category in MRP-227, Rev. 2. However, the referenced bracket bolts were always included in the plant designs but not included within the scope of a screening-based line item in Table 3-3 of MRP-227, Rev. 1-A. Thus, the new line item in Table 3-2 for the bracket bolts falls into the generic logistics issue as to why this component type was not listed and included for screening in Table 3-3 of MRP-227, Rev. 1-A. ⁵	EPRI MRP needs to address logistics issue on not having a line item-based screening assessment for this component type in Table 3-3 of MRP-227, Rev. 1-A; See explanation in table Note 5.
Corner bolts	Not Sure – See comment	Not Sure – See comment	Yes	P	Yes	May have included the CB corner bolts as a subcategory of the baffle edge bolts, CB bolts or BF bolts in Rev. 1-A.	Limited audit discussions only to confirm that the reference corner bolts were either a subset of the baffle-former bolts or baffle edge bolts in Table 3-2 of MRP-227, Rev. 1-A.

Assembly/Component Description ¹	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Baffle bolt locking devices	No	NA	Yes	P		The staff has no issue with the placement of the baffle bolt locking devices into the Primary inspection category in MRP-227, Rev. 2. However, presumably the referenced locking devices were always included in the plant designs but not included within the scope of a screening-based line item in Table 3-3 of MRP-227, Rev. 1-A. Thus, the new line item in Table 3-2 for the bracket bolts falls into the generic logistics issue as to why this component type was not listed and included for screening in Table 3-3 of MRP-227, Rev. 1-A. ⁵	EPRI MRP needs to address logistics issue on not having a line item-based screening assessment for this component type in Table 3-3 of MRP-227, Rev. 1-A; See explanation in table Note 5
Bottom Mounted Instrument (BMI) Assembly Component Screening and Categorization Results							
BMI column bodies	Yes	E	Yes	E	No	No comments	No audit of this item is necessary. Keeping the BMI columns bodies as designated Expansion components is acceptable.
BMI column collars	Yes	NAM	Yes	NAM	No	No comments	No audit of this item is necessary. Keeping the BMI columns collars as designated "No Additional Measures" (NAM) category components is acceptable.
BMI column cruciforms	Yes	NAM	Yes	E	No	No comments	No audit of this item is necessary. Elevating the BMI columns bodies as designated Expansion components is acceptable.
BMI column extension tubes	Yes	NAM	Yes	NAM	No	No comments	No audit of this item is necessary. Keeping the BMI columns extension tubes as designated "No Additional Measures" (NAM) category components is acceptable.
Core Barrel (CB) Assembly Component Screening and Categorization Results							
CB flange	Yes	X	Yes	X	Yes	Per Figure 4-32 in MRP-227, Rev. 2, not sure whether EPRI MPR is referring to the upper core barrel flange or lower core barrel flange.	Limited audit only to clear up whether the line item entries for this component type in Tables 3-3 and 4-9 of MRP-227, Rev. 2 are in reference to the upper core barrel flange, the lower core flange, or both CB flange types.
CB outlet nozzle welds	Yes	E	Yes	NAM	Yes	For the line item applying to the CB outlet nozzle welds in Table 3-3 of MRP-227, Rev. 2, the NAM categorization represents	For the audit EPRI MRP needs to be prepared to discuss the basis for downgrading the CB outlet nozzle welds into

Assembly/Component Description ¹	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
CB outlet nozzle welds - Continued						a down-grade for the 80-Year basis in Rev. 2 (versus Expansion category for the 60-Year basis in Rev. 1-A).	the NAM category for Rev. 2 versus Expansion category in Rev. 1-A.
CB upper girth weld (UGW)	Yes	P	Yes	E	Yes	<p>In Section 4.1.2 of the staff's safety evaluation for the MRP-227, Rev. 0 review, the staff did not agree with the EPRI MRP placement of the CB UGW as an Expansion category weld type that was linked the Primary category CB upper flange weld (UFW); thus, in the SE, the staff established its position that the CB UGW should be a placed as a Primary category weld type based on the safety function of the CB assembly and the potential susceptibility of the CB UGW to irradiation-assisted stress corrosion cracking (IASCC). However, in the staff's review of MRP-227 Rev. 1 (See SE of April 25, 2019), the staff reversed its position in the Dec. 16 2011 SE and approved the placement of the CB UGW as an Expansion category weld (Item W3.1 in Table 4-6 of MRP-227, Rev. 1-A) for the Primary CB upper flange weld (UFW (Item W3) in Table 4-3 of the MRP-227, Rev. 1-A. But this was done on an assessment of 60-year aging and not 80-Year aging.</p> <p>The staff's position in Section 4.1.2 of the Dec. 16, 2011 SE (i.e., CB UGW should be a Primary weld) may need to be revisited – especially since if we are now going out to 80-Year neutron fluence and gamma irradiation exposures.</p>	<p>The inspection categorization basis for the CB UGW will be the subject of both audit discussions and an RAI. For the audit, EPRI MRP needs to be prepared to discuss why the CB UGW would not again need to be bumped up to the Primary inspection category consistent with the position taken in Section 4.1.2 of the original Dec. 16, 2011 SE. It may have been acceptable to downgrade this weld type to Expansion in MRP-227, Rev. 1-A for the revised 60-year basis in that report, but not necessarily acceptable to keep the CB UGW in the Expansion category when consider the additional 20-years of irradiation dose exposures and cycles imparted to the weld type going out to an 80-Year design life. See the comments.</p>
CB middle girth weld (MGW) / lower girth weld	Yes	P	Yes	P	Yes	The staff's impression is that the EPRI MRP listed this weld type as the core barrel middle girth	Limited audit only to confirm that the proper terminology for this weld type in MRP-227, Rev. 2 is the core barrel lower girth weld (CB

Assembly/Component Description ¹	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
						weld (CB MGW) in Table 3-2 of MRP-227, Rev. 1-A and the core barrel lower girth weld (CB LGW) in Table 3-2 of MRP-227, Rev. 2.	LGW) in order to be consistent with the terminology for CB welds in Figure 4-32 of MRP-227, Rev. 2. Otherwise, no questions if the CB LGW remains a Primary category CB weld type for Westinghouse-designed units.
CB lower flange weld (LFW)	Yes	E (but per Reference to the Item W3.3, CB LFW in Item W3, core barrel upper flange weld (UFW), of Table 4-3 in MRP-227, Rev. 1-A)	Yes	E	Yes	<p>In Section 4.1.2 of the staff's safety evaluation for the MRP-227, Rev. 0 review, the staff did not agree with the EPRI MPR placement of the core barrel lower flange weld (CB LFW) as an Expansion category weld type that was linked the Primary category CB upper flange weld (UFW); thus, in the SE, the staff established its position that the CB LFW should be a placed as a Primary category weld type based on the safety function of the CB assembly and the potential susceptibility of the CB UGW to irradiation-assisted stress corrosion cracking (IASCC). However, in the staff's review of MRP-227 Rev. 1 (See SE of April 25, 2019), the staff reversed its position in the Dec. 16 2011 SE and approved the placement of the CB LFW as an Expansion category weld (Item W3.3 in Table 4-6 of MRP-227, Rev. 1-A) for the Primary CB upper flange weld (UFW (Item W3) in Table 4-3 of the MRP-227, Rev. 1-A. But this was done on an assessment of 60-year aging and not 80-Year aging.</p> <p>The staff's position in Section 4.1.2 of the Dec. 16, 2011 SE (i.e., CB LGW should be a Primary weld) may need to be revisited – especially since if we are now going out to 80-Year neutron fluence and gamma irradiation exposures.</p>	<p>The inspection categorization basis for the CB LFW will be the subject of both audit discussions and an RAI. For the audit, EPRI MPR needs to be prepared to discuss why the CB LFW would not again need to be bumped up to the Primary inspection category consistent with the position taken in Section 4.1.2 of the original Dec. 16, 2011 SE. It may have been acceptable to downgrade to Expansion in MRP-227, Rev. 1-A for the revised 60-year basis in that report, but not necessarily acceptable to keep the CB LFW in the Expansion category when consider the additional 20-years of irradiation dose exposures and cycles imparted to the weld type going out to an 80-Year design life.</p>

Assembly/Component Description ¹	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
CB cylinder axial welds (lower cylinder types [MAWs and LAWs])	Yes	E	Yes	E	Yes	Based on the St. Lucie MAW experience, Interim Guidelines for the Westinghouse-design CB MAWs and LAWs exist in the EPRI MRP 2019-009 and MRP 2019-023 guidelines.	Limited audit only to have EPRI MRP clarify how the interim guidance for CE and Westinghouse CB MAWs and LAWs in MRP 2019-009 and MRP-2019-023 apply or relate to the Expansion category basis for the Westinghouse-design CB MAWs and LAWs in Tables 3-3 and 4-6 of MRP-227, Rev. 2.
CB upper flange weld (UFW)	Yes	P	Yes	P	No	No comments.	No audit of this item is necessary. Keeping the CB UFW as a designated Primary category weld is acceptable.
CB upper cylinder axial welds (UAWs)	Yes	E	Yes	E	No	No comments.	No audit of this item is necessary. Keeping the CB UAWs as designated Expansion category welds is acceptable.
CB safety injection nozzle interface	No	N/A	Yes	NAM	Yes	CB safety injection nozzle certainly serves a safety-related structural integrity function that is necessary for safe shutdown and accident mitigation of the plant during a postulated design basis LOCA event.	EPRI MRP needs to address logistics issue on not having a line item-based screening assessment for this component type in Table 3-3 of MRP-227, Rev. 1-A; See explanation in table Note 5. Additional for the new screening basis of the CB safety injection nozzle interface in Table 3-2 of MRP-227, Rev. 2, EPRI MPR will need to discuss why the component type is being placed in NAM category, particularly when PWR safety injection nozzles serve a safety-related intended function for plant safe shutdown or accident mitigation.
Flux Thimble Tube Assembly Component Screening and Categorization Results							
Flux thimble tubes	Yes	X	Yes	X	No	Existing program is the GALL-SLR AMP XI.M37 Flux Thimble Tube Inspection Program.	No audit of this item is necessary. Keeping the flux thimble tubes as designated Existing Program components is acceptable.
Flux thimble tube plugs	Yes	NAM	Yes	NAM	Yes	Plugging of the thimble tubes is listed in GALL-SLR AMP XI.M37, "Flux Thimble Tube Inspection," as a potential corrective actions for Westinghouse-design flux thimble tubes that are determined to be leaking. Since the plugs are installed as a potential corrective action under the existing program, why isn't the inspection category for the flux thimble tube plugs also Existing Program ("X")?	As part of the audit, EPRI MPR needs to explain why the flux thimble tube plug are not being placed into the Existing Program category of MRP-227, Rev. 2.

Assembly/Component Description ¹	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Lower Support Assembly (LSA) Component Screening and Categorization Results⁴							
Fuel alignment pins	No	N/A	Yes	X	No	Using ASME BPV Code Section XI VT-3 visual inspection criteria as the Existing Program (X) category basis for the components type. I think this change came from MRP 2018-022.	No audit of the screening basis for the component type is necessary. Existing Program using the ASME Section XI inspection methods is an acceptable inspection category for the referenced component type.
Extra-long (XL) fuel alignment pins	No	N/A	Yes	X	No	Using ASME BPV Code Section XI VT-3 visual inspection criteria as the Existing Program (X) category basis for the components type. I think this change came from MRP 2018-022.	No audit of the screening basis for the component type is necessary. Existing Program using the ASME Section XI inspection methods is an acceptable inspection category for the referenced component type.
Lower core plate (LCP)	Yes	X	Yes	X	No	Using ASME BPV Code Section XI VT-3 visual inspection criteria as the Existing Program (X) category basis for the components type.	No audit of this item is necessary. Keeping the LCP as a designated Existing Program category component is acceptable.
LCP bolts and manway bolts	No	N/A	Yes	NAM	Yes	If the LCP and XL LCP types remain as Existing Program component types, why aren't the LCP bolts being placed in the Existing Program category components. Presumably, the bolts secure the LCP or XL LCP in place and are needed for structural integrity objectives.	EPRI MRP needs to address logistics issue on not having a line item-based screening assessment for these bolting component types in Table 3-3 of MRP-227, Rev. 1-A; See explanation in table Note 5. As part of the audit, EPRI MRP will also need to explain why the LCP bolts are placed into the NAM category and why they are not being placed in the Existing Program category of MRP-227, Rev. 2.
Extra-long lower core plate (XL LCP; for designs with XL LCPs)	Yes	X	Yes	X	No	Using ASME BPV Code Section XI VT-3 visual inspection criteria as the Existing Program (X) category basis for the components type.	No audit of this item is necessary. Keeping the XL LCP as a designated Existing Program category component is acceptable.
Lower support casting (CF8 CASS)	Yes	E	Yes	E	No	No comments.	No audit of this item is necessary. Keeping the LSS lower support casting as a designated Expansion category component is acceptable.
Lower support forging (type 304 SS)	Yes	E	Yes	E	No	No comments.	No audit of this item is necessary. Keeping the LSS lower support forging as a designated Expansion category component is acceptable.
Lower support column bodies	Yes	E	Yes	E	No	No comments.	No audit of this item is necessary. Keeping the LSS lower support column bodies as designated Expansion category components is acceptable.

Assembly/Component Description ¹	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Lower support column bolts	Yes	E	Yes	E	No	No comments.	No audit of this item is necessary. Keeping the LSS lower support column bolts as designated Expansion category components is acceptable.
Neutron Panel or Thermal Shield Assembly (TSA) Component Screening and Categorization Results							
Thermal shield bolts	No	N/A	Yes	NAM	Yes	This is a new component screening basis for the thermal shield bolts. Is the source of the NAM categorization for the bolts MRP 2018-022?	EPRI MRP should be prepared to discuss the NAM category basis for the thermal shield bolts.
Thermal shield flexures	Yes	P	Yes	P	No	No comments.	No audit of this item is necessary. Keeping the thermal shield flexures as designated Primary category components is acceptable. There is relevant operating experience with cracking of thermal shield flexures (I think it was a Salem unit cracking event), so the Primary category is appropriate.
Neutron panel components (for plant designs with neutron panels instead of thermal shields)	No	N/A	No	N/A	Yes	MRP-227 versions have never included Table 3-3 screening based line items for neutron panel components in Westinghouse-design PWR units that are designed with neutron panels instead of thermal shield assemblies.	As part of the audit, EPRI MRP needs to explain why the scope of Table 3-3 in MRP-227, Rev. 2 does not need to include any screening-based line items for Westinghouse design neutron panels or neutron panel component types.
Radial Support Component Screening and Categorization Results							
Radial keys	No	N/A	Yes	X	No	The radial keys got added in as Existing Program components for 60 – 80 in MRP 2018-022.	No audit of this item is necessary. Adding in the radial keys as new Existing Program components for SLR is acceptable. North Anna, Turkey Point, Surry, and Point Beach applicants all identified the radial keys as Existing Program components for SLR.
Alignment and Interfacing Component Screening and Categorization Results							
RVI hold-down spring	Yes	P	Yes	P	No	No audit comments on the Table 3-2 screening basis for the RVI hold-down spring. There will be comments in Table W2 for the MRP-227, Rev. 2 Table 4-3, Item W8 physical measurement basis for the hold-down spring.	The hold-down spring remains as a Primary category component for SLR. No audit on the screening results or final inspection category for the RVI hold-down spring is necessary (But an audit of the physical measurement basis for the spring will be necessary for Item W8 in Table W2 of this document).
Upper core plate (UCP) alignment pins	Yes	X	Yes	X	No	No comments.	No audit of the screening basis and final inspection categorization basis for the UCP alignment pins is necessary. The UCP fuel alignment pins remain Existing Program components for SLR.
Clevis inserts	No	N/A	Yes	X	No	Clevis insert components (inserts, dowels and bolts)	No audit of this item is necessary. Identifying the clevis insert components as designated

Assembly/Component Description ¹	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
						designated as Existing Program components in MRP-2018-22. Inspection bases are the ASME Section XI B-N-2 VT-3 inspections of the clevis assemblies (including bolts and dowels), which are interior attachments to the RPV wall in Westinghouse designed PWRs.	Primary category components is acceptable. Industry operating experience with detecting cracking or loss of material in clevis insert components. ASME inspections and credited and monitor for the potential degradation occurring in the clevis assemblies.
Clevis insert dowels	No	N/A	Yes	X	No	Clevis insert components (inserts, dowels and bolts) designated as Existing Program components in MRP-2018-22. Inspection bases are the ASME Section XI B-N-2 VT-3 inspections of the clevis assemblies (including bolts and dowels), which are interior attachments to the RPV wall in Westinghouse designed PWRs.	No audit of this item is necessary. Identifying the clevis insert components as designated Primary category components is acceptable. Industry operating experience with detecting cracking or loss of material in clevis insert components. ASME inspections and credited and monitor for the potential degradation occurring in the clevis assemblies.
Clevis insert bolts	Yes	X	Yes	X	No	Clevis insert components (inserts, dowels and bolts) designated as Existing Program components in MRP-2018-22. Inspection bases are the ASME Section XI B-N-2 VT-3 inspections of the clevis assemblies (including bolts and dowels), which are interior attachments to the RPV wall in Westinghouse designed PWRs.	No audit of this item is necessary. Identifying the clevis insert components as designated Primary category components is acceptable. Industry operating experience with detecting cracking or loss of material in clevis insert components. ASME inspections and credited and monitor for the potential degradation occurring in the clevis assemblies.
CRDM thermal sleeve alignment funnels	No	N/A	Yes	X	Yes – but in Table W4 of this document.	Will need to address this through a component-specific issue on the Existing Program basis for the thermal sleeve funnels in new Item W21.a in Table 4-9 of MRP-227, Rev. 2. Item W21.a cites using of the Existing Program in WCAP-16003-P, which is proprietary and has yet to be approved by the staff. Additionally, wear in the CRDM thermal sleeve funnels is the subject of the staff's SRP-SLR Section	The staff will address the screening results of the CRGT thermal sleeve funnel in Table W4 of this audit report discussion documents – as included in Table W4 for Item W21.a on Table 4-9 of MRP-227, Rev. 2.

Assembly/Component Description ¹	Assessed in Rev. 1-A	Rev. 1-A Inspection Category ¹	Assessed in Rev. 2	Rev. 2 Inspection Category ¹	Include in Audit for Screening Review? ²	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
						3.1.2.2.10, Subsection 2 AMR further evaluation guidance.	

TABLE #W1 NOTES:

1. Inspection Category Column Entry Abbreviations: (1) P – “Primary” Inspection Category, (2) E – “Expansion” Inspection Category, (3) NAM – “No Additional Measures” Inspection Category, and (4) N/A – not applicable.
2. For audit objectives, the staff has screened the component-specific aging mechanism screening and inspection category basis in MRP-227, Rev. 2 Table 3-3 in accordance with the following color coded and highlighted text – (1) **Blue** highlighted text – component-specific screening results and final inspection category in Table 3-3 of MRP-227, Rev. 2 for the specified component type do not need to be within the scope of the audit, (2) **Yellow** highlight text – aging mechanism screening results or final inspection category for the designated component type in Table 3-3 of MRP-227, Rev. 2 is subject to a limited audit review for confirmatory objectives or clarifications; and (3) **Green** highlighted text – aging mechanism screening results or final inspection category for the designated component type in Table 3-3 of MRP-227, Rev. 2 needs to be subject to more detailed audit discussions or alternative an RAI, including coverage of applicable item specific Note bases that apply to the component type in Table 3-3 of MRP-227, Rev. 2.
3. Table 3-3 in MRP-227, Rev. 2 subdivides the upper internals assembly UIA into upper core plate assembly, upper core plate and fuel align components, and upper instrumentation commodity assembly groupings. The staff is listing it as the UIA for simplicity. To avoid confusion, the staff recommendations would be to keep the assembly names for assembly line entries in Table 3-1, 3-2, and 3-3 in MRP-227, Rev. 2 consistent with those provided in the corresponding tables of MRP-227, Rev. 1-A. This will show up as a generic comment for the updated methodology in Rev. 2.
4. Table 3-3 in MRP-227, Rev. Rev. 1-A included lower internals assembly and lower support assembly for lower vertical level RVI components. In Table 3-3 of MRP-227, Rev. 2, EPRI MRP categorized the lower RVI components into lower core plate, lower support casting or forging, or lower support column assembly commodity groupings. For simplicity of the Table W1 listing for lower RVI components, the staff is siting as single assembly, the lower support assembly (LSA), to cover the lower RVI component types.
5. In other words, the component type was included in the RVI design since day one of critical reactor power operations; yet only now is the EPRI MRP including this as an assessed component type for an aging mechanism screening assessment in Table 3-3 of MRP-227, Rev. 2. Thus, the component type never got considered for a 40 – 60 Year risk-informed screening in Table 3-3 of MRP-227, Rev. 1-A and therefore was never appropriately assessed for the final inspection categorization of the component type for the first renewal (Year 40 – 60) period of the plant; this type of screening basis change raises a logistics issue for the staff for first renewal periods. This may constitute a generic logistics issue for many of the new B&W, CE, and Westinghouse component-specific line items in Table 3-1, 3-2, and 3-3 of MRP-227, Rev. 2 where the prior version of the table in MRP-227, Rev. 1-A did not include a corresponding screening-based line item for the specified component type listed in Table 3-1, 3-2 or 3-3 of MRP-227, Rev. 2. However, this may not raise to an issue for some of the components that were designated as new Existing Program components for CE or Westinghouse design PWRs (i.e., new Existing Program component types in Table 4-8 or 4-9 of MRP-227, Rev. 2) per 60 – 80 year guidance in Non-Proprietary MRP 2018-022.

II. AUDIT TABLE # W2 - ASSESSED MRP-227 CHAPTER 4, TABLE 4-3 WESTINGHOUSE COMPONENT COMPARISONS – WESTINGHOUSE PRIMARY CATEGORY COMPONENT INSPECTION RESULT CRITERIA REVISIONS IN REV. 2¹

EPRI MRP Primary Item No. Designation And Component/Scope of Units	Included as Primary in Rev. 1-A?	Method, Frequency, and Expansion Links in Rev. 1-A / Mechanism(s) of Interest	Included as Primary in Rev. 2?	Method, Frequency, and Expansion Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Control Rod Guide Tube (CRGT) Assembly Primary Category Component Inspection Bases							
W1. CRGT guide plates (guide cards) (All operating Westinghouse units)	Yes	40 – 60 Methods and Frequency: Inspections per WCAP-17451-P criteria for loss of material due to wear. 40 – 60 Expansion Components: None	Yes – but per Item W1 in Table 4-8 of MRP-227, Rev. 2 instead of Item W1 of Table 4-3 in MRP-227, Rev. 2.	60 – 80 Methods and Frequency: Same as those for Rev. 1-A but as Existing Program components.	Yes	Moved from Primary category to Existing Category components in Rev. 2 – still citing WCAP-17451-P and NSAL-17-1.	Limited audit just to clear up which version of Westinghouse Proprietary Report No. WCAP-17451-P is being implemented for SLR. Change in the category is strictly administrative. See Item W1 in Table W4 of this audit discussion topic document.
W2. CRGT lower flange welds (LFWs) (All operating Westinghouse units)	Yes	40 – 60 Methods and Frequency: EVT-1 visual inspections for cracking (SCC, fatigue, and IE) no later than two refueling outages from the subsequent period of extended operation with subsequent inspections on a 10-Year ISI interval basis. 40 – 60 Expansion Components: (a) Table 4-4, Item W2.1, remaining CRGT LFWs, and (b) Table 4-4, Item W2.2, BMI column bodies.	Yes	60 – 80 Methods and Frequency: Same as those for Rev. 1-A. 40 – 60 Expansion Components: Remain the same as those listed for 40 – 60 in Item W2 of Table 4-3, MRP-227, Rev. 1-A.	Yes	In Rev. 2, removed fatigue, TE, and IE as cracking mechanisms; only SCC remains as a listed cracking mechanism. However, the CRGT LFWs remain as applicable Primary components for 60 – 80.	Limited audit only to confirm that removal of fatigue, TE, and IE mechanisms is acceptable for 80-Year basis.

EPRI MRP Primary Item No. Designation And Component/Scope of Units	Included as Primary in Rev. 1-A?	Method, Frequency, and Expansion Links in Rev. 1-A / Mechanism(s) of Interest	Included as Primary in Rev. 2?	Method, Frequency, and Expansion Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Core Barrel Assembly (CBA) Primary Category Component Inspection Bases							
W3. CBA upper flange weld (UFW) (All operating Westinghouse units)	Yes	<p><i>40 – 60 Methods and Frequency:</i> EVT-1 visual inspections for cracking (SCC) no later than two refueling outages from the subsequent period of extended operation with subsequent inspections on a 10-Year ISI interval basis.</p> <p><i>40 – 60 Expansion Components:</i> (a) Table 4-4, Item W3.1, CBA upper girth weld (UGW), (b) Table 4-4, Item W3.2, CBA upper axial welds (UAWs), (c) Table 4-4, Item W3.3, CBA lower flange weld (LFW), and (d) Table 4-4, Item W3.4, lower support structure (LSS) lower support forging or casting.</p>	Yes	<p><i>60 – 80 Methods and Frequency:</i> Same as those for Rev. 1-A.</p> <p><i>40 – 60 Expansion Components:</i> Remain the same as those listed for 40 – 60 in Item W3 of Table 4-3, MRP-227, Rev. 1-A, but with administrative clarifications to define the Item W3.2 CBA UAWs as secondary Expansion category components linked to main Expansion category Item W3.1 CBA UGW sample-expanded inspection results or main Expansion category Item W3.2, CBA LFW sample-expanded inspection results.</p>	Yes	Staff is okay with cascading sample-expansion initiation sequences (cascading Expansion link criteria). They have been accepted for some component types in MRP-227, Rev. 1-A.	No need to audit Item W3 in Table 4-1 of MRP-227, Rev. 2 for the defined cascading sample-expansion sequences. However, EPRI MRP should be prepared to clarify whether 80-Year neutron fluence exposures of the are high enough to screen in irradiation embrittlement (IE) or irradiation-assisted stress corrosion cracking (IASCC) mechanisms.
W4. CBA lower flange weld (LFW) (All operating Westinghouse units) W4. CBA lower flange weld (LFW) - Continued	Yes	<p><i>40 – 60 Methods and Frequency:</i> EVT-1 visual inspections for cracking (SCC) no later than two refueling outages from the subsequent period of extended operation with subsequent inspections on a 10-Year ISI interval basis.</p> <p><i>40 – 60 Expansion Components:</i></p>	Yes	<p><i>60 – 80 Methods and Frequency:</i> Same as those for Rev. 1-A.</p> <p><i>40 – 60 Expansion Components:</i> Remain the same as those listed for 40 – 60 in Item W3 of Table 4-3, MRP-227, Rev. 1-A</p>	Yes	Westinghouse CBA middle axial welds (MAWs) and lower axial welds (LAWs) were subject to the EPRI MRP's interim guidance in MRP 2019-023 (dated Sept. 3, 2019; ADAMS Accession No. ML19249B102), which included (as an attachment in the guidance) the earlier guidance for CBA MAW and LAW cracking in MRP 2019-009.	EPRI MRP needs to be prepared to discuss how the guidance in MRP 2019-009 and MRP 2019-023 relates to the maintaining the CBA MAWs and LAWs as Expansion category component types for the CBA LFW. In the interim guidance, the EPRI MRP called for the Westinghouse design CBA MAWs and LAWs to be subject to a set of one-time VT-3 visual inspections (i.e., for the objective of confirming the absence of initiated cracks in the weld types [which remain as Expansion category welds]).

EPRI MRP Primary Item No. Designation And Component/Scope of Units	Included as Primary in Rev. 1-A?	Method, Frequency, and Expansion Links in Rev. 1-A / Mechanism(s) of Interest	Included as Primary in Rev. 2?	Method, Frequency, and Expansion Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
		(a) Table 4-4, Item W4.1, upper core plate, (b) Table 4-4, Item W4.2, LSS lower support column bodies (cast or non-cast), (c) Table 4-4, Item W4.3, CBA middle axial welds (MAWs), and (d) Table 4-4, Item W3.4, CBA lower axial welds (LAWs).					The staff has no information or data to ascertain whether the one-time VT-3s of the welds were performed or if performed, what the results of those VT-3 inspections revealed for licensees implementing the one time inspections of the welds. EPRI MRP applied the interim guidance to Westinghouse design CBA MAWs and LAWs even though the operating experience with cracking was detected in a CE-design unit (i.e., in one of the St. Lucie units – I think it was unit 1). Thus, this is a relevant operating experience issue.
Baffle-Former Assembly Primary Category Component Inspection Bases							
W5. Baffle-edge bolts (All operating Westinghouse units with baffle-edge bolts)	Yes	40 – 60 <i>Methods and Frequency</i> : VT-3 visual inspections for cracking (IASCC, fatigue) no later than two refueling outages from the subsequent period of extended operation with subsequent inspections on a 10-Year ISI interval basis. 40 – 60 <i>Expansion Components</i> : None.	Yes		Yes	I know we approved the VT-3 basis for Item W5 in Rev. 1-A; it hasn't changed for Item W5 in Rev. 2.	Minor audit topics: (1) EPRI MRP to remind the staff why it is acceptable for implementation of VT-3 inspections of the baffle-edge bolts, when in comparison it is UT inspections of the baffle-to-former (BF) bolts under Item W6; and (2) EPRI MRP to help us understand which U.S. Westinghouse PWRs that remain in service for reactor critical power operations are designed with baffle-edge bolts.
W6 Baffle-former (BF) bolts	Yes	40 – 60 <i>Methods and Frequency</i> : Ultrasonic test (UT) inspections for cracking (IASCC,	Yes	60 – 80 <i>Methods and Frequency</i> : For Tier 1 plant BF bolts, analogous to those	Yes	Significant Past Indian Point and Salem operating experience with	Cracking of Westinghouse-design BF bolts has been profile issue for the NRC to the extent that the NRC has had to

EPRI MRP Primary Item No. Designation And Component/Scope of Units	Included as Primary in Rev. 1-A?	Method, Frequency, and Expansion Links in Rev. 1-A / Mechanism(s) of Interest	Included as Primary in Rev. 2?	Method, Frequency, and Expansion Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
W6 Baffle-former (BF) bolts – Continued		fatigue) no later than two refueling outages from the subsequent period of extended operation with subsequent inspections on a 10-Year ISI interval basis. EPRI MRP identifies supplemental guidance in Westinghouse NSAL 16-1 applies. <i>40 – 60 Expansion Components:</i> (a) Table 4-4, Item W6.1, core barrel-former (CB-F) bolts, and (b) Table 4-4, Item W6.2, LSS lower support column bolts	Item W6.a – BF bolts for Tier 1 (4 loop downflow) PWRs	for Item W6 in Table 4-1 of Rev. 1-A but identifies that the baseline UT inspections of BF bolts in all Tier 1 plants have been completed. Identifies and that the subsequent UT inspections of the BF bolts dependent and will be based on the results of the baseline UT inspections. <i>60 – 80 Expansion Components:</i> Same as in Rev. 1-A, but establishes the Item W6.2 lower support column bolts as the main Expansion category, with cascading sample-expansion to the Item B6.1 CB-F bolts as the secondary Expansion components.		baffle-to-former (BF) bolt cracking. Many, many interim guidelines have been issued for Westinghouse-design BF bolt operating experience beyond just Westinghouse NSAL 16-1. Staff understands that the guidelines for inspecting bolts depends in part: (1) reactor coolant upflow or downflow design of the units (modified or unmodified), (2) past operating experience history of the unit with BF bolt cracking. This set up the updated BF bolt Tier bases for Items W6.a, W6.b and W6.c in Table 4-3 of MRP-227, Rev. 2.	address Westinghouse BF bolt operating experience in front of the U.S. Congress subcommittee on energy related affairs. Westinghouse BF bolt bases probably should be subject to a supplemental and special audit session or at least significant audit session time. This is have EPRI MRP clarify and go through all of the supplemental or interim, guidelines that the industry has issued on Westinghouse BF bolt operating experience, how the guidelines inter-relate, which ones remain open and which interim guidelines have been closed, and which set of interim guidelines are being relied upon for the updated guidance to for Tier 1, Tier 2 or Tier 3/4 BF bolts in Items W6.a, W6.b, and W6.c of Table 4-3, MRP-227, Rev. 2. Will need confirmation that the BF bolt UT baseline inspections for all Westinghouse Tier 1 plants have been completed – Note: Indian Point units are either under permanent defueled license operations or are preparing for permanent defueled license operations. Also EPRI MRP to clarify whether current Tier ranking for BF bolts can change for Tier 2, 3, or 3 types (to Tier 1) based number of bolts with detected cracking or sufficient number of cracked bolt groups where the set of cracked bolts are
			Yes Item W6.b – BF bolts for Tier 2 PWRs Item W6.b – BF bolts for Tier 2 PWRs – continued	<i>60 – 80 Methods and Frequency:</i> For Tier 2 BF bolts, analogous to those for Item W6 in Table 4-1 of Rev. 1-A; but identifies that the baseline UT inspections of BF bolts in all Tier 2 plants will need to be completed by 30 EFPY, with subsequent UT inspections of the BF			

EPRI MRP Primary Item No. Designation And Component/Scope of Units	Included as Primary in Rev. 1-A?	Method, Frequency, and Expansion Links in Rev. 1-A / Mechanism(s) of Interest	Included as Primary in Rev. 2?	Method, Frequency, and Expansion Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
W6 Baffle-former (BF) bolts - Continued				bolts dependent and will be based on the results of the baseline UT inspections. <i>60 – 80 Expansion Components:</i> Same Expansion category for Tier 2 BF bolts in Item W6.b that were listed for Tier 1 BF bolts in Item W6.a – including the cascading sample- <i>expansion</i> initiation sequence bases			grouped into a clustered commodity group region basis.
			Yes Item W6.c – BF bolts for Tier 3 and 4 PWRs	<i>60 – 80 Methods and Frequency:</i> For Tier 3 BF bolts, analogous to those for Item W6 in Table 4-1 of Rev. 1-A; but identifies that the baseline UT inspections of BF bolts in all Tier 2 plants will need to be completed by 35 EFPY, with subsequent UT inspections of the BF bolts dependent and will be based on the results of the baseline UT inspections.			
			Item W6.c – BF bolts for Tier 3 and 4 PWRs – continued	<i>60 – 80 Expansion Components:</i> Same Expansion category for Tier 3 or Tier 4 BF bolts in Item W6.b that were listed for Tier 1 BF bolts in			

EPRI MRP Primary Item No. Designation And Component/Scope of Units	Included as Primary in Rev. 1-A?	Method, Frequency, and Expansion Links in Rev. 1-A / Mechanism(s) of Interest	Included as Primary in Rev. 2?	Method, Frequency, and Expansion Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
				Item W6.a – including the cascading sample-expansion initiation sequence bases			
W7. Baffle-former assembly (including baffle plates, baffle edge bolts, bracket bolts [if applicable], corner bolts [if applicable] and former plates) (All operating Westinghouse units)	Yes (Note: bracket bolts not included in Item W7, Table 4-1 in MRP-227 Rev. 1-A)	40 – 60 <i>Methods and Frequency</i> : VT-3 visual inspections for distortion (VS) or cracking (IASCC) with the baseline inspections to be completed between 20 and 40 EPFY and subsequent inspections on a 10-Year ISI interval basis. 40 – 60 <i>Expansion Components</i> : None.	Yes (Note: reference of baffle edge bolts removed from Item W7, Table 4-1 in MRP-227 Rev. 2)	60 – 80 <i>Methods and Frequency</i> : VT-3 visual inspections for distortion (VS) or cracking (IASCC) with the baseline inspections to be completed between 20 and 40 EPFY and subsequent inspections on a 10-Year ISI interval basis. 60 – 80 <i>Expansion Components</i> : None.	No	For MRP-227, Rev. 1-A, listing of baffle edge bolts in both Item W5 and Item W7 was a redundant practice. EPRI MRP fixed the redundancy by removing reference to baffle edge bolts in Item W7 in Table 4-1 of MRP-227, Rev. 2. They are covered by Item W5 in Rev. 2. No issue here.	No audit of the update of Item W7 in Table 4-1, MRP-227, Rev. 2 is necessary.
Alignment and Interface Components – Primary Component Inspection Bases							
W8. RVI hold-down spring (All Westinghouse units designed with type 304 stainless steel RVI hold-down springs) W8. RVI hold-down spring - Continued	Yes	40 – 60 <i>Methods and Frequency</i> : Direct physical measurement of the spring height (for distortion [VS] or loss of preload {ISC/IC}) within three cycles of the beginning of the license renewal period (before or after entry into the period); additional measurements if first measurements are not sufficient to project remaining life. 40 – 60 <i>Expansion Components</i> : None.	Yes	60 – 80 <i>Methods and Frequency</i> : Same as those for the hold-down spring in Item W8 of Table 4-1, MRP-227, Rev. 1-A. 60 – 80 <i>Expansion Components</i> : None.	Yes	See general audit discussion topic on use of physical measurements as a specified inspection technique.	General physical measurement topic applies to the physical measurement basis for Westinghouse RVI hold-down springs. Even if EPRI's basis is that another physical measurement would not be need for the subsequent period of extended operation, why not subsequent visual inspections by VT-3 techniques on a 10-Year interval?
Thermal Shield Assembly Primary Category Component Inspection Bases							
W9. Thermal shield flexures	Yes	40 – 60 <i>Methods and Frequency</i> : VT-3	Yes	60 – 80 <i>Methods and Frequency</i> : Same as	Yes	Recent operating with extensive thermal shield	Recent operating experience needs to be discussed with the

EPRI MRP Primary Item No. Designation And Component/Scope of Units	Included as Primary in Rev. 1-A?	Method, Frequency, and Expansion Links in Rev. 1-A / Mechanism(s) of Interest	Included as Primary in Rev. 2?	Method, Frequency, and Expansion Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
		visual inspections for cracking (SCC, fatigue) no later than two refueling outages from the subsequent period of extended operation with subsequent inspections on a 10-Year ISI interval basis. Inspections cover 100% of the accessible surfaces in 100% of the population of the thermal shield flexures. <i>40 – 60 Expansion Components: None.</i>		those for the thermal shield flexures in Item W9 of Table 4-1, MRP-227, Rev. 1-A. <i>60 – 80 Expansion Components: None.</i>		flexure cracking (one of the Salem units). Additionally, PSE&G performed a plant modification of the thermal shield flexure design for the replacement thermal shield flexures that were installed at the impacted Salem reactor unit.	staff, including how EPRI MRP dispositioned the thermal shield flexure cracking experience and whether there are any applicable supplemental or interim guidelines that apply to the thermal shield flexures. Additionally, EPRI MRP or Westinghouse should be prepared to discuss whether alternate replacement thermal shield flexure design requires aging management.

TABLE #W2 NOTES:

- The staff has screened audit needs for the specified MRP-227, Rev. 2, table 4-3 inputs in accordance with the following color coded basis: (1) Blue highlighted text – specified Primary category component type does not need to be subject to an audit review for the component-specific inspection result basis; (2) Yellow highlighted text – specified Primary category component type is subject to a limited audit review of the component-specific inspection result basis, but only for confirmatory clarification objectives; and (3) Green highlighted text – inspection basis (including Expansion component link basis) for the specified Primary category component type in Table 4-3 of MRP-227, Rev. 2, needs to be subject to more detailed audit discussions, included applicable item specific Note bases that apply to the component type in Table 4-3 of MRP-227, Rev. 2.

III. AUDIT TABLE #W3 - ASSESSED MRP-227 CHAPTER 4, TABLE 4-6 WESTINGHOUSE COMPONENT COMPARISONS – WESTINGHOUSE EXPANSION CATEGORY COMPONENT INSPECTION RESULT CRITERIA REVISIONS IN REV. 2¹

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Expansion in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Expansion in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Control Rod Guide Tube (CRGT) Assembly Expansion Category Components							
W2.1 Remaining CRGT lower flange welds (LFWs – non peripheral types) (All operating Westinghouse units)	Yes	40 – 60 Methods and Frequency: When triggered, EVT-1 visual for cracking (SCC, fatigue, TE, IE), with subsequent inspection on a 10-year ISI interval frequency. Inspections to cover a minimum 75% of the lower flange weld surface plus ¼ inch adjacent base metal. 40 – 60 Primary Components: Item W2, Primary CRGT peripheral LFWs.	Yes	60 – 80 Methods and Frequency: Same as those Item W2.1 in Table 4-4, MRP-227, Rev. 1-A for 40 – 60. 60 – 80 Primary Components: Remains as the Item W2, Primary CRGT peripheral LFWs.	No	Relevant condition is as surface breaking crack-like flaw.	No need to audit the updated version of Item W2.1 in Table 4-6, MRP-227, Rev. 2.
Bottom Mounted Instrumentation (BMI) System Expansion Category Components							
W2.2 BMI column bodies) (All operating Westinghouse units)	Yes	40 – 60 Methods and Frequency: When triggered, VT-3 visual inspection (of 100% of the column bodies for which difficulty is detected during the flux thimble tube insertion/withdrawal) for cracking (fatigue, TE, IE), with subsequent inspection on a 10-year ISI interval frequency. Inspections to cover a minimum 75% of the lower flange weld surface plus ¼ inch adjacent base metal.	Yes	60 – 80 Methods and Frequency: Same as those Item W2.2 in Table 4-4, MRP-227, Rev. 1-A for 40 – 60. 60 – 80 Primary Components: Remains as the Item W2, Primary CRGT peripheral LFWs.	Yes	See limited audit topic.	No real questions but seek technical clarification on the meaning of the terminology “100% of BMI column bodies for which difficulty is detected during the flux thimble tube insertion/withdrawal”.
W2.2 BMI column bodies) - Continued							

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Expansion in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Expansion in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
		<i>40 – 60 Primary Components: Item W2, Primary CRGT peripheral LFWs.</i>					
Upper Internals Assembly (UIA) Expansion Category Components							
W4.1 Upper core plate (All operating Westinghouse units)	Yes	<i>40 – 60 Methods and Frequency:</i> If triggered, VT-3 visual inspection for cracking (fatigue, IE) or wear with subsequent inspections on a 10 interval frequency <i>40 – 60 Primary Components:</i> The Item W4, CBA lower girth weld (LGW).	Yes	<i>60 – 80 Methods and Frequency:</i> Same as those Item W2.2 in Table 4-4, MRP-227, Rev. 1-A for 40 – 60. <i>60 – 80 Primary Components:</i> Remains as the Item W4, Primary CBA LGW.	No	The minimum coverage is 25% of the core side plate surfaces. However, per Table 4-4 Note 3 in Rev. 1-A or Note 6 in Rev. 2, the stated minimum coverage requirement is the minimum if no significant indications are found. However, the Examination Acceptance criteria in Section 5 require that additional coverage must be achieved in the same outage if significant flaws are found. This contingency should be considered for inspection planning purposes.	No need to audit the updated version of Item W4.1 item in Table 4-6 of MRP-227, Rev. 2.
Core Barrel Assembly (CBA) Expansion Category Components							
W3.1 CBA upper girth weld (UGW) W3.2 CBA upper axial welds (UAWs) – W3.3 CBA lower flange weld (LFW) Item W3.1, W3.2, and W3.3 CBA Expansion weld types – Continued (All operating Westinghouse units)	Yes	<i>40 – 60 Methods and Frequency:</i> When triggered, EVT-1 visual for cracking (SCC), with subsequent inspection on a 10-year ISI interval frequency. Inspections to cover a 100% of the accessible weld length of one side of the weld (for the LFW type it is the OD side of the weld) plus ¾ of	Yes	<i>60 – 80 Methods and Frequency:</i> Same as those Item W3.1, W3.2, and W3.3 in Table 4-4, MRP-227, Rev. 1-A for 40 – 60; however updated to allow for inspection by EVT-1 visual, ultrasonic testing (UT) or eddy current testing (ECT) methods. <i>60 – 80 Primary Components:</i> Remains as the Item	No	Per April 25, 2019, SE on MRP-227, Rev. 1-A, minimum cumulative coverage criterion for inspection credit is minimum 50% of the weld length. In Item W3 of Table 5-3, MRP-227, Rev. 1-A EPRI MRP defined the CBA UAWs secondary Expansion welds for the main Expansion Item W3.1 CBA UGW and Item W3.3 CBA LFW.	No need to audit the updated versions of Items W3.1, W3.2, or W3.3 in Table 4-6 of MRP-227, Rev. 2.

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Expansion in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Expansion in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
		<p>an inch adjacent base metal.</p> <p><i>40 – 60 Primary Components:</i> Item W3, Primary CBA upper flange weld (UFW); Item W3.1 Main Expansion Category CBA UGW and Item W3.3 Main Expansion Category CBA LFW</p>		<p>W3, Primary CBA UFW and the Main Expansion Category Item W3.1, CBA UGW and Item W3.3, CBA LFW</p>		<p>In Rev. 2, MRP administratively edited of MRP-227, Rev. 2 to include the secondary sample-expansion basis for the Item W3.3 CBA UAWs in updated Item W3.3 of Table 4-6, MRP-227, Rev. 2 and in Item W3 of Table 5-3, MRP-227, Rev. 2.</p>	
<p>W4.2 CBA middle axial welds (MAWs)</p> <p>W4.3 CBA lower axial welds (LAWs)</p> <p>(All operating Westinghouse units)</p>	<p>Yes</p>	<p><i>40 – 60 Methods and Frequency:</i> When triggered, EVT-1 visual for cracking (SCC, IASCC, IE), with subsequent inspection on a 10-year ISI interval frequency. Inspections to cover a 100% of the accessible weld from the OD side of the weld plus ¼ of an inch adjacent base metal.</p> <p><i>40 – 60 Primary Components:</i> Item W4, Primary CBA lower girth weld (LGW)</p>	<p>Yes</p>	<p><i>60 – 80 Methods and Frequency:</i> Same as those Items W4.2 and W4.3 in Table 4-4, MRP-227, Rev. 1-A for 40 – 60; however updated to allow for inspection by EVT-1 visual, ultrasonic testing (UT) or eddy current testing (ECT) methods.</p> <p><i>60 – 80 Primary Components:</i> Remains as the Item W4, Primary CBA LGW.</p>	<p>Yes</p>	<p>See operating experience-related comments for Item W4 in Audit Table #W2.</p>	<p>Similar to the audit topic for Item W4 in Audit Table #W2, the relevancy of the St. Lucie MAW and LAW operating experience must be discussed for relevancy to the updated versions of Items W4.2 and W4.3 in Table 4-6 of MRP-227, Rev. 2.</p>
<p>W6.1 Core barrel-to-former (CB-F) bolts</p> <p>Note: secondary Expansion category bolts for the main Expansion category Item W6.2 lower support column bolts</p>	<p>Yes</p>	<p><i>40 – 60 Methods and Frequency:</i> When triggered by inspection on the main Expansion category Item W6.2 lower support column bolts, volumetric UT inspection of 100% of</p>	<p>Yes</p>	<p><i>60 – 80 Methods and Frequency:</i> Same as those for Item W6.1 CB-F bolts in Table 4-6, MRP-227, Rev. 1-A</p> <p><i>60 – 80 Primary Components:</i></p>	<p>No</p>	<p>Item W6 in Table 5-3 of MRP-227, Rev. 1-A established the CB-F bolts as secondary Expansion category bolts for the main Expansion Item W6.2 lower support column bolts. In Rev. 2, MRP</p>	<p>No need to audit the updated version of the W6.1 item for the CB-F bolts in Table 4-6 of MRP-227, Rev. 2.</p>

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Expansion in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Expansion in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
(All operating Westinghouse units)		<p>the accessible bolts for cracking (for IASCC or fatigue; minimum 75% population for inspection credit), with re-inspections on a 10-Year interval basis.</p> <p><i>40 – 60 Primary and Main Expansion Components:</i> The Item W6, Primary baffle-to-former (BF) bolts; Item W6.2, Main Expansion Category LSS lower support column bolts</p>		Remains as the Item W6, Primary BF bolts and the Item W6.2 main Expansion category lower support column bolts		administratively edited of MRP-227, Rev. 2 to include the secondary sample-expansion basis for the CB-F bolts or forging both in updated Item W6.1 of Table 4-6, MRP-227, Rev. 2 and in Item W6 of Table 5-3, MRP-227, Rev. 2.	
Lower Support Structure (LSS) or Lower Internals Assembly (LIA) Expansion Category Components							
<p>W3.4 LSS lower support casting or forging</p> <p>Note: secondary Expansion category base metal components for the main Expansion category Item W3.3 CBA lower flange weld (LFW)</p> <p>(All operating Westinghouse units)</p> <p>W3.4 LSS lower support casting or forging – Continued</p>	Yes	<p>When triggered by the results of inspection performed on main Expansion category Item W3.3 CBA lower flange weld (LFW), VT-3 visual for cracking (SCC, and TE if the component is a casting made from CASS CF8), with subsequent inspection on a 10-year ISI interval frequency. Inspections to cover a minimum 25% of the bottom (non-core side) surface.</p> <p><i>40 – 60 Primary and Main Expansion Category Components:</i> Item W3, Primary CBA</p>	Yes	<p><i>60 – 80 Methods and Frequency:</i> Same as those for Item W3.4 LSS lower support casting or forging in Table 4-6, MRP-227, Rev. 1-A</p> <p><i>60 – 80 Primary Components:</i> Remain as the Item W3, Primary CBA upper flange weld (UFW) and the Item W3.3, Main Expansion Category CBA LFW.</p>	No	Item W3 in Table 5-3 of MRP-227, Rev. 1-A established the LSS lower support casting or forging as a secondary Expansion category base metal component for the main Expansion category Item W3.3 CBA lower flange weld (LFW). In Rev. 2, MRP administratively edited of MRP-227, Rev. 2 to include the secondary sample-expansion basis for the lower support casting or forging both in in updated Item W3.4 of Table 4-6, MRP-227, Rev. 2 and in Item W3 of Table 5-3, MRP-227, Rev. 2.	No need to audit the updated version of the W3.4 item for the lower support casting or forging in Table 4-6 of MRP-227, Rev. 2.

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Expansion in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Expansion in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
		upper flange weld (UFW); Item W3.3, Main Expansion Category CBA LFW.					
W4.4 LSS column bodies (for both cast or non-cast types) (All operating Westinghouse units)	Yes	When triggered, VT-3 visual for cracking (IASCC, IE), with subsequent inspection on a 10-year ISI interval frequency. Inspections to cover a minimum 25% of total number of column assemblies (both visible and non-visible from above the lower core plate, with the VT-3 from above the core plate); inspections must be evenly distributed across the population of column bodies <i>40 – 60 Primary Components:</i> Item W4, Primary CBA lower girth weld (LGW)	Yes	<i>60 – 80 Methods and Frequency:</i> Same as those for Item W4.4 LSS column bodies in Table 4-6, MRP-227, Rev. 1-A <i>60 – 80 Primary Components:</i> Remains as the Item W4, Primary CBA LGW	No	No comments.	No need to audit the updated version of the W4.4 item for the LSS column bodies in Table 4-6 of MRP-227, Rev. 2.
W6.2 Lower support column bolts (All operating Westinghouse units)	Yes	<i>40 – 60 Methods and Frequency:</i> When triggered by inspection on the main Expansion category Item W6.2 lower support column bolts, volumetric UT inspection of 100% of the accessible bolts for cracking (for IASCC or fatigue; minimum 75% population for	Yes	<i>60 – 80 Methods and Frequency:</i> <i>60 – 80 Primary Components:</i>	No	On top of Primary Category item W6 baffle-to-former (BF) bolts, the Item W6.2 lower support column bolts Are the Main Expansion Category bolts for the Item W6.1 Secondary Expansion core barrel-to-former (CB-F) bolts.	No need to audit the updated version of the W6.2 item for the lower support column bolts in Table 4-6 of MRP-227, Rev. 2.

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Expansion in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Expansion in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
		inspection credit), with re-inspections on a 10-Year interval basis. 40 – 60 Primary Components: Item W6, Primary category baffle-to-former (BF) bolts					

TABLE #W3 NOTES:

- The staff has screened audit needs for the specified MRP-227, Rev. 2, Table 4-6 inputs in accordance with the following color coded basis: (1) **Blue** highlighted text – specified Expansion category component type does not need to be subject to an audit review for the component-specific inspection result basis in Table 4-6 of MRP-227, Rev. 2; (2) **Yellow** highlighted text – specified Expansion category component type is subject to a limited audit review for the inspection result basis but only to confirm the same inspection results (including the Primary component link basis) in Table 4-6 of MRP-227, Rev. 1-A, can carry forward as the component-specific inspection result basis in Table 4-6 of MRP-227, Rev. 2; and (3) **Green** highlighted text – inspection basis (including Primary component link basis) for the specified Expansion category component type in Table 4-6 of MRP-227, Rev. 2, needs to be subject to more detailed audit discussions, included any applicable item-specific Note bases that apply to the component type in Table 4-6 of MRP-227, Rev. 2.

IV. AUDIT TABLE #W4 - ASSESSED MRP-227 CHAPTER 4, TABLE 4-9 WESTINGHOUSE COMPONENT COMPARISONS – WESTINGHOUSE EXISTING PROGRAM CATEGORY COMPONENTS – INSPECTION RESULT CRITERIA REVISIONS IN REV. 2¹

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Existing Program in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Existing Program in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Control Rod Guide Tube (CRGT) Existing Program Components.							
W1 CRGT guide plates (guide cards), c-tubes, and sheaths	No	[Instead, Item W1 was included in Primary Category Item W1 in Table 4-3 of MRP-227, Rev. 1-A]	Yes	60 – 80 Methods and Frequency: Citing the WCAP-17451 VT-3 methods as the Existing program criteria is the same as what was used for the components, as Item W1 Primary components in Table 4-3 of MRP-227, Rev. 1-A.	Yes	Change in category from Primary to Existing Program in Table 4-9, MRP-227, Rev. 2 is strictly administrative. Still using latest version of WCAP-17451 for the inspections of the CRGT assembly components. Fig. 4-30 in Rev. 2	Limited audit only to clear up which version of WCAP-17451-P that is being used for the current inspection basis and whether Westinghouse NSAL-17-1 still applies (and whether these records have been docketed with the NRC).
Core Barrel Assembly (CBA) Existing Program Components							
W10. Core barrel flange (All operating Westinghouse-designed PWRs)	Yes	40 – 60 Methods and Frequency: ASME XI VT-3 for loss of material due to wear one every 10 years.	Yes	60 – 80 Methods and Frequency: Same as for Item W10 components in Table 4-9 of MRP-227, Rev. 2.	No	No comments. Fig. 4-32 in Rev. 2	No need to audit updated version of Item W10 in Table 4-9 of MRP-227, Rev. 2.
Upper Internals Assembly (UIA) Existing Program Components							
W11 UIA upper support ring or skirt (All operating Westinghouse-designed PWRs)	Yes	40 – 60 Methods and Frequency: ASME XI VT-3 for cracking (SCC, fatigue) one every 10 years.	Yes	60 – 80 Methods and Frequency: Same as for Item W11 components in Table 4-9 of MRP-227, Rev. 2.	No	No comments. Fig. 4-44 in Rev. 2	No need to audit updated version of Item W11 in Table 4-9 of MRP-227, Rev. 2.
W15 Upper core plate alignment pins	Yes	40 – 60 Methods and Frequency: ASME XI VT-3 for loss of materials due to	Yes	60 – 80 Methods and Frequency: Same as those for Item W15 in Table	Yes	Technical Bulletin TB 16-4. Fig. 4-46 in Rev. 2.	Limited audit only to clarify why EPRI created new Item W16 rather in Table 4-9 of MRP-227, Rev. 2 rather than just account

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Existing Program in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Existing Program in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
(All operating Westinghouse-design PWRs)		wear, as supplemented by TB 16-4 methods.		4-9 of MRP-227, Rev. 1-A.			for the possibility of Malcomized alignment pins in the existing W15 item. EPRI to confirm TB 16-4 still applies and indicate whether TB 16-4 has been submitted for inclusion in ADAMS. Otherwise, no questions.
W16 Upper core plate alignment pins (All Westinghouse-design PWRs with Malcomized fuel alignment pins)	No	NA	Yes	60 – 80 Methods and Frequency: ASME XI VT-3 for loss of material due to wear, as supplemented by TB 16-4 methods.			
Lower Internals Assembly (LIA) and Lower Support Structure (LSS) Existing Program Components							
W12a LIA lower support plate or extra-long (XL) lower support plate (All operating Westinghouse-designed PWRs)	Yes	40 – 60 Methods and Frequency: ASME XI VT-3 for cracking (IASCC, fatigue), as supplemented by TB 16-4 methods.	Yes – But Items W12a and W12b were merged into a single Item W12 for the lower support plate/XL lower support plate in Table 4-9 of MRP-227, Rev. 2. (covering cracking, loss of materials due to wear, and irradiation embrittlement)	60 – 80 Methods and Frequency: ASME Section XI VT-3 of the lower/XL lower core plate to detect evidence of distortion or loss of bolted integrity at the plate that may be indicated of cracking or loss of material (wear) occurring in the lower plate assembly.	Yes	Westinghouse Bulletin TB 16-4 applies. No issue with the merging of Items W12a and W12b into new Item W12. Fig. 4-39 in Rev. 2.	Only to confirm that TB 16-4 still applies and that TB 16-4 has been submitted into ADAMS. Otherwise, no questions.
W12b LIA lower support plate or extra-long (XL) lower support plate (All operating Westinghouse-designed PWRs)	Yes	40 – 60 Methods and Frequency: ASME XI VT-3 for loss of material due to wear, as supplemented by TB 16-4 methods.					
W17 LIA lower fuel alignment pins (All Westinghouse-designed PWRs with	No	NA	Yes	60 – 80 Methods and Frequency: ASME XI VT-3 for loss of material due to wear, as	Yes	Lower fuel alignment pins/XL lower fuel alignment pins added for inclusion in Table 4-9 in	Only to find out why not just create one new Item W17 for lower fuel alignment pins/XL fuel alignment pins that covers both

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Existing Program in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Existing Program in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
Malcomized fuel alignment pins)				supplemented by TB 16-4 methods.		MRP 2018-022.	loss of material due to wear and cracking (IASCC, fatigue, TE)?
W18 LIA extra-long (XL) lower fuel alignment pins (All Westinghouse XL-designed PWRs)	No	NA	Yes	60 – 80 Methods and Frequency: ASME XI VT-3 for cracking (IASCC, fatigue, IE).		Fig. 4-47 in Rev. 2	
Bottom Mounted Instrumentation (BMI) System Existing Program Components							
W13 Flux thimble tubes (All operating Westinghouse-designed PWRs)	Yes	40 – 60 Methods and Frequency: Inspections per IEB Bulletin 88-09 commitments.	No	NA	No	Covered by AMP XI.37, Flux Thimble Tube Inspection in the GALL-SLR report	Deletion of Item B13 in Table 4-9 of MRP-227, Rev. 2 acceptable given the flux thimble tubes are managed by GALL-SLR AMP XI.M37, "Flux Thimble Tube Inspection," and not GALL-SLR AMP XI.M16A, PWR Vessel Internals." No. audit questions on this administrative change to Table 4-9. AMP still calls for implementation of IEB 88-09 program, with XI.M37 AMP defined by Southern Company (Tim Wells) years back for the NRC and accepted for incorporation in the GALL-SLR.
Alignment and Interfacing Existing Program Components and Radial Supports							
W14 Clevis bearing stellite wear surfaces; clevis insert bolts (All operating Westinghouse-design PWRs)	Yes	40 – 60 Methods and Frequency:	Yes	60 – 80 Methods and Frequency: ASME Section XI VT-3 or UT as supplemented by TB 14-5 and OG-21-160. Augmented ISI criteria per OG-21-160	Yes	Westinghouse TB 14-5 applies. Fig. 4-45 in Rev. 2. Wear of clevis assembly surfaces that included a Stellite wear surface was added in MRP 2018-022. However, what about the OpE with cracking of clevis dowels and Ginna OpE involving distortion of clevis insert assemblies?	Yes – operating experience with cracked clevis insert dowels and the Ginna clevis insert assembly distortion OpE needs to be discussed as part of the audit. Also, are TB 14-5 and OG-21-160 docketed records in ADAMS?
W19 Upper core plate inserts	No	NA	Yes	60 – 80 Methods and Frequency: ASME XI VT-3 for loss of material due to wear.	No	Added in MRP 2018-022. Fig. 4-48 in Rev. 2.	No Questions for the new Item W19 on the upper core plate inserts, as given in Table 4-9 of MRP-227, Rev. 2.

EPRI MRP Expansion Item No. Designation And Component/Scope of Units	Included as Existing Program in Rev. 1-A?	Method, Frequency, and Primary Links in Rev. 1-A / Mechanism(s) of Interest	Included as Existing Program in Rev. 2?	Method, Frequency, and Primary Links in Rev. 2 / Mechanism(s) of Interest	Need for Audit Review Of Inspection Basis?	Comments	Audit Topic (No Need to Assess Component-Specific Inspection Basis in Audit Rpt., Inspection Change Closed w/o RAI, or Issue RAI)
W20 Radial Support Keys	No	NA	Yes	<i>60 – 80 Methods and Frequency:</i> ASME XI VT-3 for loss of material due to wear.	No	Added in MRP 2018-022. Fig. 4-49 in Rev. 2.	No Questions for the new Item W20 on the radial support keys, as given in Table 4-9 of MRP-227, Rev. 2.
W21 Upper control rod mechanism (CRD) penetration thermals sleeves (All Westinghouse design PWRs with thermal sleeves)	No	NA	Yes	<i>60 – 80 Methods and Frequency:</i> ASME XI VT-3 for loss of material due to wear.	Yes	Added in MRP 2018-022. Fig. 4-50 in Rev. 2. Supplemental reports include MRP 2018-027; NRC IN 2018-10; OG 19-101, and PWROG Report WCAP-16003-P. See SRP-SLR (NUREG-2192) AMR further evaluation guidance for managing loss of material due to wear in Westinghouse-design CRD penetration nozzle thermal sleeves.	EPRI ERP should be prepared to discuss all supplemental methodologies referenced in the new W21 Item in Table 4-9 of MRP-227, Rev. 2. Is WCAP-16003-P an NRC-approved methodology?

TABLE #W4 NOTES:

- The staff has screened audit needs for the specified MRP-227, Rev. 2 Table 4-9 inputs in accordance with the following color coded basis: (1) Blue highlighted text – specified Expansion category component type does not need to be subject to an audit review for the component-specific inspection result basis in Table 4-9 of MRP-227, Rev. 2; (2) Yellow highlighted text – specified Expansion category component type is subject to a limited audit review for the inspection result basis but only to confirm the same inspection results (including the Primary component link basis) in Table 4-9 of MRP-227, Rev. 1-A can carry forward as the component-specific inspection result basis in Table 4-9 of MRP-227, Rev. 2; and (3) Green highlighted text – inspection basis (including Primary component link basis) for the specified Expansion category component type in Table 4-9 of MRP-227, Rev. 2 needs to be subject to more detailed audit discussions, included any applicable item-specific Note bases that apply to the component type in Table 4-9 of MRP-227, Rev. 2.

V. AUDIT TABLE #CE5 - ASSESSED MRP-227 CHAPTER 5, TABLE 5-2 WESTINGHOUSE COMPONENT COMPARISONS – WESTINGHOUSE PRIMARY CATEGORY COMPONENT ACCEPTANCE CRITERIA REVISIONS IN REV. 2¹

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
Control Rod Guide Tube (CRGT) Assembly Expansion and Acceptance Criteria							
W1 CRGT guide plates (All operating units)	Yes	<p><i>40 – 60 Method:</i> Methods of inspection per WCAP-17451-P</p> <p><i>40 – 60 Expansion linked components:</i> None</p> <p><i>40 – 60 Relevant Condition(s):</i> detected wear that could lead to loss of CRGT alignment and impede control assembly rod insertion.</p>	No - Table 5-3, Item W1 acceptance and expansion criteria deleted in MRP-227, Rev. 2.	NA	No	<p>Now Existing Program Item W1 for Table 4-9, MRP-227, Rev. 2. Change is administrative. Still inspecting per WCAP-17451-P guidelines.</p> <p>See prior comments for Item W1 in Audit Table #W4.</p>	No issue with the deletion of Item W1 in Table 5-3 of MRP-227, Rev. 2. WCAP-17451-P Inspections of the CRGT guide card, C-tubes, and sheaths are now done per Existing Program Item W1 in Table 4-9 of MRP-227, Rev. 2.
W2 Peripheral CRGT lower flange welds (LFWs) (All operating units)	Yes	<p><i>40 – 60 Method:</i> EVT-1 visual inspections of the welds.</p> <p><i>40 – 60 Expansion linked components:</i> Item W2.1, remaining (non-peripheral CRGT lower flange welds, and Item W2.2 bottom mounted instrument (BMI) column bodies</p> <p><i>40 – 60 Expansion criteria:</i> Confirmed surface breaking indications in two or more CRGT peripheral LFWs shall require EVT-1 of the remaining accessible non-peripheral CRGT LFW and VT-3 visuals of the BMI column bodies by the next refueling outage.</p>	Yes	<p><i>60 – 80 Method:</i> Same as those for 40 – 60 in Item W2 of Table 5-3, MRP-227, Rev. 1-A</p> <p><i>60 – 80 Expansion linked components:</i> Same as those for 40 – 60 in Item W2 of Table 5-3, MRP-227, Rev. 1-A</p> <p><i>60 – 80 Expansion criteria:</i> Same as those for 40 – 60 in Item W2 of Table 5-3, MRP-227, Rev. 1-A.</p> <p><i>60 – 80 Relevant Condition (applies to Primary and Expansion category components):</i> Same as those for 40 – 60 in Item W2 of Table 5-3, MRP-227, Rev. 1-A</p>	No	No comments.	No Questions for the updated version of Item W3 for the CRGT LFWs, as given in Table 5-3 of MRP-227, Rev. 2.
W2 Peripheral CRGT lower flange welds (LFWs) – Continued							

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
		<p>40 – 60 Relevant Condition (applies to Primary and Expansion category components): In the weld components, the relevant condition is a surface breaking crack-like indication. For the BMI column bodies, the relevant condition is a detected completely fractured column body.</p>					
Core Barrel Assembly (CBA) and Baffle-Former Assembly Expansion Criteria and Acceptance Criteria							
<p>W3 CBA upper flange weld (UFW) (All operating units)</p> <p>W3 CBA upper flange weld (UFW) – Continued</p>	<p>Yes</p>	<p>40 – 60 Method: Enhanced EVT-1 visual inspection of the weld</p> <p>40 – 60 Main and Secondary Expansion components: Item W3.1, Main Expansion CBA upper girth weld (UGW) and Item W3.3, Main Expansion CBA lower flange weld (LFW); Item W3.2, Secondary Expansion CBA upper axial welds (UAWs), and Item W3.4, Secondary Expansion LSS lower support casting or forging.</p> <p>40 – 60 Main and Secondary Expansion criteria: Main expansion - Confirmed detection and sizing of a surface-breaking flaw indication greater than 2 inches in length in the UFW requires EVT-1 visual inspection of the</p>	<p>Yes</p>	<p>60 – 80 Method: Same as those for 40 – 60 in Item W3 of Table 5-3, MRP-227, Rev. 1-A, with allowance for inspection by EVT-1 visual, UT, or ECT techniques.</p> <p>60 – 80 Expansion linked components: Same as those for 40 – 60 in Item W3 of Table 5-3, MRP-227, Rev. 1-A</p> <p>60 – 80 Expansion criteria: Same as those for 40 – 60 in Item W3 of Table 5-3, MRP-227, Rev. 1-A.</p> <p>60 – 80 Relevant Condition (applies to Primary and Expansion category components): Same as those for 40 – 60 in Item W3 of Table 5-3, MRP-227, Rev. 1-A</p>	<p>Yes</p>	<p>Relevant conditions from EVT-1 visual techniques need to be better defined and distinguished from relevant conditions that may be detected by volumetric UT inspections or those detected by eddy current testing (ECT) techniques.</p>	<p>Line Items W3 and W4 in Table 5-3 of Rev. 2 now permits licensee made decision on which inspection technique will be used for inspection (EVT-1, ECT, or UT); yet the type of NDE parameters that give indication a crack-like indication are all different for these techniques.</p> <p>Specifically, ECT monitor equipment signals of crack-like indications are different from UT monitor equipment signals of crack-like conditions; and EVT-1 methods are looking for direct or remote visual evidence</p>

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
W3 CBA upper flange weld (UFW) – Continued		<p>CBA UGW and LFW by completion of the next refueling outage.</p> <p>Secondary expansion - Confirmed detection and sizing of a surface-breaking flaw greater than 2 inches in length in either the UGW or LFW requires inspection of the UAWs by completion of the next refueling outage; similarly, detection of a confirmed surface-breaking flaw greater than 2 inches in length in either the CBA LFW requires inspection of lower support casting or forging (25% of the core side surface) within the next three refueling outages. If indications are detected in the lower support casting or forging, the coverage shall be expanded to 100 % of the lower support casting or forging during the same refueling outage.</p> <p><i>40 – 60 Relevant Condition(s) (applies to Primary, first Expansion, and secondary Expansion bolt types):</i> Detectable crack-like surface condition.</p>					<p>of surface breaking crack-like conditions.</p> <p>Thus, EPRI needs to address why Items W3 and W4 in Table 5-3 of Rev. 2 do not have any distinction regarding the difference in condition parameters that are monitored by the various NDE techniques (including EVT-1, UT and ECT techniques.)</p>
W4 CBA lower girth weld (LGW) (All operating units)	Yes	<i>40 – 60 Method:</i> Enhanced EVT-1 visual inspection of the weld	Yes	<i>60 – 80 Method:</i> Same as those for 40 – 60 in Item W4 of Table 5-3, MRP-227, Rev. 1-A, with allowance for inspection by	Yes	Relevant conditions from EVT-1 visual techniques need to be better	Line Items W3 and W4 in Table 5-3 of Rev. 2 now permits licensee made decision on which

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
W4 CBA lower girth weld (LGW) – Continued		<p>40 – 60 Main and Secondary Expansion components: Item W3.1, Main Expansion CBA upper girth weld (UGW) and Item W3.3, Main Expansion CBA lower flange weld (LFW); Item W3.2, Secondary Expansion CBA upper axial welds (UAWs), and Item W3.4, Secondary Expansion LSS lower support casting or forging.</p> <p>40 – 60 Expansion criteria: Confirmed detection and sizing of a surface-breaking flaw indication greater than 2 inches in length in the LGW requires EVT-1 visual inspection of: (a) 25% of the upper core plate core side surface by completion of the next refueling outage, (b) inspections of the CBA MAWs and LAWs by completion of the next refueling outage, and (c) lower support column bodies (cast and non-cast within the next three refueling outages. Secondary expansion – If an indication is found in the 25% inspected region of the upper core plate, the sample shall be expanded to 100% of the core plate in the same refueling outage.</p>		<p>EVT-1 visual, UT, or ECT techniques.</p> <p>60 – 80 Expansion linked components: Same as those for 40 – 60 in Item W4 of Table 5-3, MRP-227, Rev. 1-A</p> <p>60 – 80 Expansion criteria: Same as those for 40 – 60 in Item W4 of Table 5-3, MRP-227, Rev. 1-A.</p> <p>60 – 80 Relevant Condition (applies to Primary and Expansion category components): Same as those for 40 – 60 in Item W4 of Table 5-3, MRP-227, Rev. 1-A.</p>		<p>defined and distinguished from relevant conditions that may be detected by volumetric UT inspections or those detected by eddy current testing (ECT) techniques.</p>	<p>inspection technique will be used for inspection (EVT-1, ECT, or UT); yet the type of NDE parameters that give indication a crack-like indication are all different for these techniques.</p> <p>Specifically, ECT monitor equipment signals of crack-like indications are different from UT monitor equipment signals of crack-like conditions; and EVT-1 methods are looking for direct or remote visual evidence of surface breaking crack-like conditions. Thus, EPRI needs to address why Items W3 and W4 in Table 5-3 of Rev. 2 do not have any distinction regarding the difference in condition parameters that are monitored by the various NDE techniques (including EVT-1, UT and ECT techniques.)</p>

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
		<p>inspection of the UAWs by completion of the next refueling outage; similarly, detection of a confirmed surface-breaking flaw greater than 2 inches in length in either the CBA LFW requires inspection of lower support casting or forging (25% of the core side surface) within the next three refueling outages. If indications are detected in the lower support casting or forging, the coverage shall be expanded to 100 % of the lower support casting or forging during the same refueling outage.</p> <p><i>40 – 60 Relevant Condition(s) (applies to Primary, first Expansion, and secondary Expansion bolt types):</i> Detectable crack-like surface condition.</p>					
<p>W5 Baffle-edge bolts (Only units with this type of bolt)</p>	<p>Yes</p>	<p><i>40 – 60 Method:</i> VT-3 visual inspections of the bolts.</p> <p><i>40 – 60 Expansion components:</i> None.</p> <p><i>40 – 60 Relevant Conditions:</i> Relevant conditions for the VT-3 examination are visual evidence (direct or</p>	<p>Yes</p>	<p><i>60 – 80 Method:</i> Same as those for Item W5 in Table 5-3 of MRP-227, Rev. 1-A</p> <p><i>60 – 80 Expansion components:</i> None.</p> <p><i>60 – 80 Relevant Conditions:</i> Same as those for Item W5 in Table 5-3 of MRP-227, Rev. 1-A</p>	<p>Yes</p>	<p>Same comment on Item W5 for Table 4-3 in MRP-227, Rev. 2. Why a VT-3 visual of the baffle-edge bolts when the BF bolts in Item W6 receive a UT inspection?</p>	<p>Minor audit topics: (1) EPRI MRP to remind the staff why it is acceptable for implementation of VT-3 inspections of the baffle-edge bolts, when in comparison, it is UT inspections of the baffle-to-former</p>

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
		remote) of missing or broken locking devices, cracked, failed or missing bolts, or protrusion of the bolt heads.					(BF) bolts under Item W6; and (2) EPRI MRP to help us understand which U.S. Westinghouse PWRs that remain in service for reactor critical power operations are designed with baffle-edge bolts.
<p>W6 Baffle-to-former (BF) bolts (All operating units)</p> <p>W6 Baffle-to-former (BF) bolts – Continued</p>	Yes	<p><i>40 – 60 Method:</i> Ultrasonic testing (UT)</p> <p><i>40 – 60 Main and Secondary Expansion components:</i> (a) the Item W6.2, LSS lower support column bolts are listed as the main Expansion components for the Item W6 BF bolts, (b) the Item W6.1 core barrel-to-former (CB-F) bolts are secondary Expansion bolts for the main Expansion category LSS lower support column bolts</p> <p><i>40 – 60 Main and Secondary Expansion Criteria:</i> (a) Confirmed indications in more than 5% of BF bolts inspected in the four baffle plates located at the largest distance from the core (presumed lower fluence BF bolts) calls for inspection of the LSS lower support column bolts within the next three refueling</p>	Yes	<p><i>60 – 80 Methods (Redefined):</i> UT of BF bolts and main Expansion LSS lower support column bolts; either UT or VT-3 visual inspections of CB-F bolts, depending on whether the need for inspection of the CB-F bolts is triggered directly from the Primary BF bolt inspections (clustered bolt population results) or else from the main Expansion category LSS lower support column bolt inspections.</p> <p><i>60 – 80 Main and Secondary Expansion components (Redefined):</i> (a) the Item W6.2, LSS lower support column bolts are listed as the main Expansion components for the Item W6 BF bolts, (b) the Item W6.1 core barrel-to-former (CB-F) bolts are main Expansion bolts when triggered by clustered population results from UT inspection performed on Primary category Item W6 BF bolts</p>	Yes	<p>See prior comments on Item W6 line item entry for Audit Discussion Table #W2.</p> <p>What minimum percentage of Item W6.1 LSS lower support column bolts needs to be inspected for inspection credit if triggered by the UT results for UT inspections performed on the Primary Item B6 BF bolts.</p> <p>What defines a “large cluster of bolts” (for BF bolt inspections) in order to make the Item W6.1 CB-F bolts main Expansion category components instead of</p>	<p>Inspection, Expansion link criteria, acceptance criteria and relevant conditions for BF bolts, CB-F bolts and LSS lower support column bolt inspection criteria needs to be a special audit discussion topic.</p>

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
W6 Baffle-to-former (BF) bolts – Continued		<p>outages; (b) Confirmed indications in more than 5% of the examined LSS lower support column bolts calls for UT inspection of the CB-F bolts within the next three refueling outages.</p> <p><i>40 – 60 Relevant Conditions:</i> Relevant conditions for UT of Primary BF bolts, main Expansion category LSS lower support column bolts, or secondary Expansion core barrel-to-former (CB-F) bolts states that the relevant conditions “shall be established as part of the examination technical justification.”</p>		<p>(c) the Item W6.1 CB-F bolts are secondary Expansion bolts when triggered by the results of UT inspection performed on the Item W6.2 main Expansion category LSS lower support column bolts.</p> <p><i>60 – 80 Main and Secondary Expansion Criteria (Redefined):</i> (a) Confirmed indications in more than 5% of BF bolts inspected in the four baffle plates located at the larges distance from the core (presumed lower fluence BF bolts) calls for inspection of the LSS lower support column bolts within the next three refueling outages; (b) Confirmed presence of a large cluster of degraded BF bolts calls for VT-3 inspection (<i>note the change in inspection method</i>) of the CB-F bolts adjacent to the cluster of failed BF bolts within the next three refueling cycles, (c) Confirmed indications in more than 5% of the examined LSS lower support column bolts calls for UT inspection method) of the CB-F bolts within the next three refueling outages.</p> <p><i>60 – 80 Relevant Conditions (Redefined):</i> (a) Relevant conditions for UT of Primary BF bolts, main Expansion category</p>		<p>secondary Expansion category components?</p> <p>Why does the inspection method change to VT-3 of the CB-F bolts when UT inspections of the BF bolts demonstrate clustered groups of cracked BF bolts and the degree of clustering is sufficient to trigger main sample-<i>expansion</i> to the CB-F bolts?</p> <p>Are bolts being failed upon detection of crack-like indications? Otherwise, what industry report forms the basis for the examination technical justification that is needed? How many clustered regions (and size of clustered regions) is permitted before sample-<i>expansion based</i> corrective</p>	

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W6 Baffle-to-former (BF) bolts - Continued				LSS lower support column bolts, or secondary Expansion core barrel-to-former (CB-F) bolts states that the relevant conditions "shall be established as part of the examination technical justification." (b) Relevant conditions for VT-3 visual inspections of CB-F bolts (when secondary Expansion bolts) are "missing bolts or lock bars, protruding bolts or lock bars, and visibly cracked bolts, lock bars, or lock bar welds.		<p>action is triggered to the CB-F bolts?</p> <p>Is main sample-expansion to the LSS lower support column bolts being triggered only by the number of BF bolts with detected crack-like condition (for those exceeding the size limit and population criteria in the examination technical justification) or does sufficient clustered groups of bolts with failed/non-conforming indications prompt sample-expansion to the LSS lower core support column bolts?</p> <p>EPRI needs to be prepared to summarize all supplemental reports or methodologies on BF bolts issued by the EPRI MRP, PWROG, or industry vendors and to identify all</p>	

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						<p>supplemental methods that currently remain in effect for Westinghouse-design BF bolts.</p> <p>EPRI MRP needs to be prepared to discuss use of "acceptable bolting pattern analysis methodologies" for BF bolts (e.g., WCAP-15029-P-A). They are being referenced in WCAP-17096, Rev. 3.</p>	

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W7 Baffle-former assembly (including baffle plates, bracket and corner bolts (if included in plant design, and former plates) (All operating units)		<p><i>40 – 60 Method:</i> Simple reference as a VT-3 visual inspection of the assembly.</p> <p><i>40 – 60 Expansion components:</i> None</p> <p><i>40 – 60 Relevant Conditions:</i> Relevant conditions are defined as visual evidence (direct or remote) of “abnormal interaction with fuel assemblies, gaps along high fluence baffle plate joints, vertical displacement of baffle plates near high fluence joints, or more than 2 broken or damaged baffle edge bolt locking systems along high fluence baffle plate joints.”</p>		<p><i>60 – 80 Method:</i> Redefined to indicate visual VT-3 inspection of the assembly core side surfaces (at 40 EFPY; reinspection every 10 Years at: (1) high fluence baffle joints, (2) top and bottom edges of baffle plates, and (3) bolts and locking devices</p> <p><i>60 – 80 Expansion components:</i> None.</p> <p><i>60 – 80 Relevant Conditions:</i> Repackaged but pretty the much the same as those defined for Item W7 CB assembly in Table 5-3 of MRP-227, Rev. 1-A.</p>	No	Redefined Item W7 criteria seem better than those defined in Item W7 of Table 5-3 in MRP-227, Rev. 1-A.	Redefined criteria in Item W7, Table 5-3, MRP-227, Rev. 2 seem fine.
Alignment and Interfacing Components Expansion and Acceptance Criteria							
W8 Internals hold-down spring (All operating units with type 304 stainless steel RVI hold-down springs)	Yes	<p><i>40 – 60 Method:</i> Direct physical measurement of the hold-down spring height.</p> <p><i>40 – 60 Expansion components:</i> None</p> <p><i>40 – 60 Relevant Conditions:</i> Relevant condition acceptance criterion is that: “the remaining compressible height of the spring shall provide hold-down forces within the plant-</p>	Yes	<p><i>60 – 80 Method:</i> Redefined as direct physical measurement of the hold-down spring (within 3 cycles of the license renewal period [before or after entry into the period] at several points around the circumference of the spring [statistically representative sample]).</p> <p><i>60 – 80 Expansion components:</i> None</p> <p><i>60 – 80 Relevant Conditions:</i> Redefined only</p>	Yes	First and foremost, is EPRI MRP calling for a second round of physical measurements for plants applying for SLR? Why not subsequent VT-3 inspection (on a 10-Year basis) after the physical measurement?	Lots of matters to go over with EPRI MRP for SLR aging management of internals hold-down springs (for Westinghouse units that have them). See comments of questions in the previous column entry.

EPRI MRP Primary Item No. Designation And Component/Scope of Units ²	Included in Table 5-1 of MRP-227, Rev. 1-A	Rev. 1-A Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Included in Table 5-1 of MRP-227, Rev. 2	Rev. 2 Acceptance Criteria Basis (including inspection methods, Expansion links, and acceptance criteria)	Need to Table 5-1 Item in the Audit?	Comments	Audit Topic / Audit Resolution
W8 Internals hold-down spring – Continued		specific design tolerance.”		to state the physical measurement looks for: “Distortion (loss of load due to stress relaxation).”		<p>Which of the current operating Westinghouse units are designed with RVI hold-down springs?</p> <p>Remaining compressible height relative to “what”?</p> <p>What does EPRI consider to be a statistically representative sample of physical measurements that will be needed for the SPEO?</p> <p>What is/are the truly defined relevant condition(s) versus acceptance criterion/criteria for the defined relevant condition(s)?</p> <p>Which plant document establishes the needed hold-down forces and allowable tolerances on hold-down spring height?</p>	

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						<p>Item W9 of Table 4-3, MRP-227 Rev. 2) or specific criteria from TB 19-5 included in Item W9 of Table 5-3, MRP-227, Rev. 2?</p> <p>Staff may not agree with the change on relevant conditions as redefined and stated in Item W9 of Table 5-3 in MRP-227, Rev. 2. It eliminates wear of the flexures as a defined aging mechanism and appears to be waiting for complete failure of the flexures – yet, from the Salem experience, we know the flexures can crack (and quite extensively).</p>	

TABLE #W5 NOTES:

1. The staff has screened audit needs for the specified MRP-227, Rev. 2, Table 5-3 inputs in accordance with the following color coded basis: (1) **Blue** highlighted text – specified acceptance criteria basis for specified Primary and Expansion category component types in Table 5-3 of the MRP-227 Rev. 1-A or Rev. 2 versions does not need to be subject to an audit review for the component-specific basis in Table 5-3 of MRP-227, Rev. 2; (2) **Yellow** highlighted text – specified acceptance criteria basis for specified Primary and Expansion category component types in Table 5-3 of the MRP-227 Rev. 1-A or Rev. 2 versions is subject to a limited audit review for the inspection result basis but only to confirm the same inspection criteria for the specified Primary and Expansion components types can carry forward as the acceptance criteria basis in Table 5-3 of MRP-227, Rev. 2; and (3) **Green** highlighted text – the specified acceptance criteria basis for specified Primary and Expansion category component types in Table 5-3 of MRP-227, Rev. 2 needs to be subject to more detailed audit discussions, included any applicable item-specific Note bases that apply to the component type in Table 5-3 of MRP-227, Rev. 2.

SUBJECT: REGULATORY AUDIT PLAN FOR ELECTRIC POWER RESEARCH INSTITUTE TECHNICAL REPORT MATERIALS RELIABILITY PROGRAM-227, REVISION 2, "MATERIALS RELIABILITY PROGRAM: PRESSURIZED WATER REACTOR INTERNALS INSPECTION AND EVALUATION GUIDELINES" (EPID L-2022-TOP-0029) DATED: OCTOBER 11, 2022

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