AUDIT WORKSHEET
GALL REPORT AMP

PLANT: _____

LRA AMP: _____ **REVIEWER:** _____

GALL AMP: **XI.M4, BWR Vessel ID Attachment Welds** **DATE:** _____

Program Element	Auditable GALL Criteria	Documentation of Audit Finding
Program Description	A. The program includes (a) inspection and flaw evaluation in accordance with the guidelines of staff-approved boiling water reactor vessel and internals project (BWRVIP)-48, and	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria: Comment:
"	B. (b) monitoring and control of reactor coolant water chemistry in accordance with the guidelines of BWRVIP-29 (Electric Power Research Institute [EPRI] TR-103515) to ensure the long-term integrity and safe operation of boiling water reactor (BWR) vessel inside diameter (ID) attachment welds.	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria: Comment:
1. Scope of Program	A. The program is focused on managing the effects of cracking due to stress corrosion cracking (SCC), including intergranular stress corrosion cracking (IGSCC). The program contains preventive measures to mitigate SCC inservice inspection (ISI) to detect cracking and monitor the effects of cracking on the intended function of the components, and repair and/or replacement, as needed, to maintain the ability to perform the intended function.	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria: Comment:

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“	B. The guidelines of BWRVIP-48 include inspection recommendations and evaluation methodologies for the attachment welds between the vessel wall and vessel ID brackets that attach safety-related components to the vessel (e.g., jet pump riser braces and core-spray piping brackets). In some cases, the attachment is a simple weld; in others, it includes a weld build-up pad on the vessel. The BWRVIP-48 guidelines include information on the geometry of the vessel ID attachments, evaluate susceptible locations and safety consequence of failure, provide recommendations regarding the method, extent, and frequency of inspection, and discuss acceptable methods for evaluating the structural integrity significance of flaws detected during these examinations.	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria: Comment:
2. Preventive Actions	A. The BWRVIP-48 provides guidance on detection, but does not provide guidance on methods to mitigate cracking. Maintaining high water purity reduces susceptibility to SCC or IGSCC. Reactor coolant water chemistry is monitored and maintained in accordance with the guidelines in BWRVIP-29 (EPRI TR-103515). The program description and evaluation and technical basis of monitoring and maintaining reactor water chemistry are presented in Section XI.M2, “Water Chemistry.”	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria: Comment:
3. Parameters Monitored/ Inspected	A. The program monitors the effects of SCC and IGSCC on the intended function of vessel attachment welds by detection and sizing of cracks by ISI in accordance with the guidelines of approved BWRVIP-48 and the requirements of the American Society of Mechanical Engineers (ASME) Code, Section XI, Table IWB 2500-1 (2001 edition including the 2002 and 2003 Addenda). An applicant may use the guidelines of BWRVIP-62 for inspection relief for vessel internal components with hydrogen water chemistry provided that such relief is submitted under the provisions of 10 CFR 50.55a and approved by the staff.	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria: Comment:
4. Detection of Aging Effects	A. The extent and schedule of the inspection and test techniques prescribed by BWRVIP-48 guidelines are designed	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria:

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	to maintain structural integrity and ensure that aging effects will be discovered and repaired before the loss of intended function. Inspection can reveal cracking. Vessel ID attachment welds are inspected in accordance with the requirements of ASME Section XI, Subsection IWB, examination category B-N-2. The Section XI inspection specifies visual VT-1 examination to detect discontinuities and imperfections on the surfaces of components and visual VT-3 examination to determine the general mechanical and structural condition of the component supports. The inspection and evaluation guidelines of BWRVIP-48 recommend more stringent inspections for certain attachments. The guidelines recommend enhanced visual VT-1 examination of all safety-related attachments and those nonsafety-related attachments identified as being susceptible to IGSCC. Visual VT-1 examination is capable of achieving 1/32 in. resolution; the enhanced visual VT-1 examination method is capable of achieving a 1-mil wire resolution. The nondestructive examination (NDE) techniques appropriate for inspection of BWR vessel internals including the uncertainties inherent in delivering and executing NDE techniques in a BWR, are included in BWRVIP-03.	Comment:
5. Monitoring and Trending	A. Inspections scheduled in accordance with IWB-2400 and approved BWRVIP-48 guidelines provide timely detection of cracks. If flaws are detected, the scope of examination is expanded.	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria: Comment:
6. Acceptance Criteria	A. Any indication detected is evaluated in accordance with ASME Section XI or the staff-approved BWRVIP-48 guidelines. Applicable and approved BWRVIP-14, BWRVIP-59, and BWRVIP-60 documents provide guidelines for evaluation of crack growth in stainless steels (SSs), nickel alloys, and low-alloy steels, respectively.	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria: Comment:
7. Corrective	A. Repair and replacement procedures are equivalent to those	Consistent with GALL AMP: ☐ Yes ☐No

Program Element	Auditable GALL Criteria	Documentation of Audit Finding
Actions	requirements in the ASME Section XI. Repair is performed in conformance with IWB-4000 and replacement occurs according to IWB-7000. As discussed in the appendix to this report, the staff finds that licensee implementation of the guidelines in BWRVIP-48, as modified, will provide an acceptable level of quality for inspection and flaw evaluation of the safety-related components addressed in accordance with 10 CFR Part 50, Appendix B, corrective actions.	Document(s) used to confirm Criteria: Comment:
8. Confirmation Process	A. Site quality assurance (QA) procedures, review and approval processes, and administrative controls are implemented in accordance with the requirements of 10 CFR Part 50, Appendix B. As discussed in the appendix to this report, the staff finds that licensee implementation of the guidelines in BWRVIP-48, as modified, will provide an acceptable level of quality for inspection and flaw evaluation of the safety-related components addressed in accordance with the 10 CFR Part 50, Appendix B, confirmation process and administrative controls.	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria: Comment:
9. Administrative Controls	A. See Item 8, above.	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria: Comment:
10. Operating Experience	A. Cracking due to SCC, including IGSCC, has occurred in BWR components. The program guidelines are based on an evaluation of available information, including BWR inspection data and information on the elements that cause IGSCC, to determine which attachment welds may be susceptible to cracking. Implementation of the program provides reasonable assurance that cracking will be adequately managed and the intended functions of the vessel ID attachments will be maintained consistent with the current licensing basis (CLB) for the period of extended operation.	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria: Comment:

EXCEPTIONS

Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
1.				
2.				
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ENHANCEMENTS

Item Number	Program Elements	LRA Enhancement Description	Basis for Accepting Enhancement	Documents Reviewed (Identifier, Para.# and/or Page #)
1.				
2.				
…				

DOCUMENT REVIEWED DURING AUDIT

Document Number	Identifier (number)	Title	Revision and/or Date
1.			
2.			
3.			
4.			
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