

**AUDIT WORKSHEET**  
**GALL REPORT AMP**

PLANT: \_\_\_\_\_

LRA AMP: \_\_\_\_\_

REVIEWER: \_\_\_\_\_

GALL AMP: **XI.M10, Boric Acid Corrosion**

DATE: \_\_\_\_\_

Program Element	Auditable GALL Criteria	Documentation of Audit Finding
Program Description	<p>A. The program relies in part on implementation of recommendations in Nuclear Regulatory Commission (NRC) Generic Letter (GL) 88-05 to monitor the condition of the reactor coolant pressure boundary for borated water leakage. Periodic visual inspection of adjacent structures, components, and supports for evidence of leakage and corrosion is an element of the NRC GL 88-05 monitoring program. Potential improvements to boric acid corrosion programs have been identified as a result of recent operating experience with cracking of certain nickel alloy pressure boundary components (NRC Regulatory Issue Summary 2003-013). Borated water leakage from piping and components that are outside the scope of the program established in response to GL 88-05 may affect structures and components that are subject to aging management review. Therefore, the scope of the monitoring and inspections of this program includes all components that contain borated water that are in proximity to structures and components that are subject to aging management review. The scope of the evaluations, assessments and corrective actions include all observed leakage sources and the affected structures and components. Borated water leakage may be discovered by activities other than those established specifically to detect such leakage. Therefore, the program includes provisions for triggering evaluations and assessments when leakage is discovered by other activities.</p>	<p>Consistent with GALL AMP: <input type="checkbox"/> Yes <input type="checkbox"/> No Document(s) used to confirm Criteria:</p> <p>Comment:</p>

Program Element	Auditable GALL Criteria	Documentation of Audit Finding
1. Scope of Program	<p>A. The program covers any structures or components on which boric acid corrosion may occur (e.g., steel and aluminum), and electrical components on which borated reactor water may leak. The program includes provisions in response to the recommendations of NRC GL 88-05. The staff guidance of NRC GL 88-05 provides a program consisting of systematic measures to ensure that corrosion caused by leaking borated coolant does not lead to degradation of the leakage source or adjacent structures and components, and provides assurance that the reactor coolant pressure boundary will have an extremely low probability of abnormal leakage, rapidly propagating failure, or gross rupture. Such a program provides for (a) determination of the principal location of leakage, (b) examination requirements and procedures for locating small leaks, and (c) engineering evaluations and corrective actions to ensure that boric acid corrosion does not lead to degradation of the leakage source or adjacent structures or components, which could cause the loss of intended function of the structures or components.</p>	<p>Consistent with GALL AMP: <input type="checkbox"/> Yes <input type="checkbox"/> No  Document(s) used to confirm Criteria:</p> <p>Comment</p>
2. Preventive Actions	<p>A. Minimizing reactor coolant leakage by frequent monitoring of the locations where potential leakage could occur and timely repair if leakage is detected prevents or mitigates boric acid corrosion. Preventive measures also include modifications in the design or operating procedures to reduce the probability of leaks at locations where they may cause corrosion damage and use of suitable corrosion resistant materials or the application of protective coatings.</p>	<p>Consistent with GALL AMP: <input type="checkbox"/> Yes <input type="checkbox"/> No  Document(s) used to confirm Criteria:</p> <p>Comment:</p>
3. Parameters Monitored/ Inspected	<p>A. The aging management program (AMP) monitors the effects of boric acid corrosion on the intended function of an affected structure and component by detection of borated water leakage. Borated water leakage results in deposits of white boric acid crystals and the presence of moisture that can be observed by the naked eye.</p>	<p>Consistent with GALL AMP: <input type="checkbox"/> Yes <input type="checkbox"/> No  Document(s) used to confirm Criteria:</p> <p>Comment:</p>

Program Element	Auditable GALL Criteria	Documentation of Audit Finding
4. Detection of Aging Effects	A. Degradation of the component due to boric acid corrosion cannot occur without leakage of borated water. Conditions leading to boric acid corrosion, such as crystal buildup and evidence of moisture, are readily detectable by visual inspection, though removal of insulation may be required in some cases. The program delineated in NRC GL 88-05 includes guidelines for locating small leaks, conducting examinations, and performing engineering evaluations. In addition, the program includes appropriate interfaces with other site programs and activities such that borated water leakage that is encountered by means other than the monitoring and trending established by this program is evaluated and corrected. Thus, the use of the NRC GL 88-05 program will assure detection of leakage before the loss of the intended function of the affected components.	Consistent with GALL AMP: <input type="checkbox"/> Yes <input type="checkbox"/> No Document(s) used to confirm Criteria:  Comment:
5. Monitoring and Trending	A. The program provides monitoring and trending activities as delineated in NRC GL 88-05, timely evaluation of evidence of borated water leakage identified by other means, and timely detection of leakage by observing boric acid crystals during normal plant walkdowns and maintenance.	Consistent with GALL AMP: <input type="checkbox"/> Yes <input type="checkbox"/> No Document(s) used to confirm Criteria:  Comment:
6. Acceptance Criteria	A. Any detected borated water leakage or crystal buildup will be evaluated to confirm or restore the intended functions of affected structures and components consistent with the design basis prior to continued service.	Consistent with GALL AMP: <input type="checkbox"/> Yes <input type="checkbox"/> No Document(s) used to confirm Criteria:  Comment:
7. Corrective Actions	A. Borated water leakage and areas of resulting boric acid corrosion are evaluated and corrected in conformance with the applicable provisions of NRC GL 88-05 and the corrective action program. Any detected boric acid crystal buildup or deposits should be cleaned. NRC GL 88-05 recommends that corrective actions to prevent recurrences of degradation caused by	Consistent with GALL AMP: <input type="checkbox"/> Yes <input type="checkbox"/> No Document(s) used to confirm Criteria:  Comment:

Program Element	Auditable GALL Criteria	Documentation of Audit Finding
	<p>borated water leakage be included in the program implementation. These corrective actions include any modifications to be introduced in the present design or operating procedures of the plant that (a) reduce the probability of primary coolant leaks at locations where they may cause corrosion damage, and (b) entail the use of suitable corrosion resistant materials or the application of protective coatings or claddings. As discussed in the appendix to this report, the staff finds the requirements of 10 CFR Part 50, Appendix B, acceptable to address the corrective actions.</p>	
8. Confirmation Process	<p>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 the requirements of 10 CFR Part 50, Appendix B, acceptable to address confirmation process and administrative controls.</p>	<p>Consistent with GALL AMP: <input type="checkbox"/> Yes <input type="checkbox"/> No  Document(s) used to confirm Criteria:   Comment:</p>
9. Administrative Controls	<p>A. See Item 8, above.</p>	<p>Consistent with GALL AMP: <input type="checkbox"/> Yes <input type="checkbox"/> No  Document(s) used to confirm Criteria:   Comment:</p>
10. Operating Experience	<p>A. Boric acid corrosion has been observed in nuclear power plants (NRC Information Notices [INs] 86-108 [and supplements 1 through 3] and 2003-02) and has resulted in significant impairment of component intended functions in areas that are difficult to access/observe (NRC Bulletin 2002-01).</p>	<p>Consistent with GALL AMP: <input type="checkbox"/> Yes <input type="checkbox"/> No  Document(s) used to confirm Criteria:   Comment:</p>

EXCEPTIONS

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

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.			
....			