APPENDIX B, TABLE B.2.6

DISPOSITION OF NEI COMMENTS ON CHAPTER VII OF GALL REPORT

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Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII-1	General comment on System Interface	Include a reference to Section VII I (Carbon Steel Components) for the external surfaces of piping in each specific section's System Interface paragraph.	The external surfaces of piping etc. is included in the scope of Carbon Steel Components (VII I). The link between Carbon Steel Components and the individual sections is not clearly established in the System Interface sections of the individual sections.	The external surfaces of piping are included in the scope of carbon steel structures and components in Section I of Chapter VII. The links between CS components and the individual sections were made by revising the GALL report to include the following sentence in "Systems, Structures and Components" in Sections A1 to H2 of Chapter VII: "Aging management programs for degradation of external surface of carbon steel components are included in Section VII.I." The GALL report was revised to address this comment.
G-VIIA-1	A1.1.1 (p. A1-4)	Remove reference to "Coating Degradation."	"Coating Degradation" is not a mechanism, the other items listed are. The condition of the coating does not directly affect the intended function, only indirectly through the other listed mechanisms.	The carbon steel (CS) new fuel rack assembly is susceptible to general, pitting, and crevice corrosion. Because the condition of the coating does not directly affect the intended function, coating degradation was deleted as an aging mechanism of concern for auxiliary systems. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIA1-1	VII.A1.1.1, page VIIA1-5	Aging Management Program should list Structures Monitoring program.	Additional information is superfluous.	The carbon steel (CS) new fuel rack assembly is susceptible to general, pitting, and crevice corrosion. The appropriate Aging Management Program (AMP) is "Structural Monitoring" (XI.S6, NUREG-1801, Vol. 2). The GALL report was revised to address this comment.
G-VIIA2-1	VII A2-4 (item A2.1.1)	Provide a separate line for each of the neutron absorbing materials (Boraflex, Boral, Boron Steel).	The AMP described in VII A2-5 is based on NRC guidance and industry experience of Boraflex aging mechanisms and aging effects. There is no specific NRC guidance or known industry issues with Boral and Boron Steel. Aging management effects for Boral and Boron should remain plant specific.	The Boraflex neutron absorbing sheets in spent fuel storage racks can degrade with a subsequent reduction of neutron-absorbing capacity. The appropriate AMP is "Boraflex Monitoring" (XI.M22, NUREG-1801, Vol. 2). Since little NRC guidance or industry experience is available for the degradation of Boral and Boron Steel neutron absorbing sheets in spent fuel storage racks, a plant-specific AMP needs to be evaluated. The GALL report was revised to create separate line items to distinguish between the AMPs for Boraflex and Boral/Boron Steel.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIA2-2	VII A2-4 (item A2.1.1)	Add Storage Racks under "Region of interest" column, Stainless Steel under "Material" column. If AMP is required, reference a generic AMP or state plant specific.	Stainless Steel storage racks are listed in page VII A2-3 as included in Section A2.	Stainless steel spent fuel storage racks are exposed to chemically treated oxygenated water (in BWRs) or borated water (in PWRs). The AMP for this new line item is water chemistry (XI.M2 in NUREG-1801, Vol. 2) to manage crack initiation and growth due to stress corrosion cracking. The GALL report was revised to address this comment.
G-VIIA2-3	VIIA2, page VIIA2-5	Aging Management Program column should only identify the Boraflex Monitoring Program and the program should be evaluated in Chapter XI of GALL.	Additional information in AMP column is superfluous and should be included in the evaluation if it is to stay.	The Boraflex neutron absorbing sheets in spent fuel storage racks can degrade with a subsequent reduction of neutron-absorbing capacity. The appropriate AMP is "Boraflex Monitoring" (XI.M22, NUREG-1801, Vol. 2). Redundant information was deleted. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIA2-4	VII A2-5	Eliminate the requirement for both visual inspection of the coupons and the BADGER device inspection.	Either of the two methods in addition to RACKLIFE provides reasonable assurance that aging of boraflex is adequately managed.	The visual inspection of the Boraflex coupons is not needed if the measurement of boron areal density and predictive modeling is in place. Boron areal density (BADGER) in conjunction with a predictive model (RACKLIFE) and periodic verification is an acceptable and conservative method of determining the amount of Boraflex remaining in the spent fuel pool racks. The GALL report was revised to address this comment.
G-VIIA2-5	VII A2-5	Delete the sentence “corrective action may consist of providing additional neutron absorbing capacity.”	This is one option only. There are other corrective measures that could be taken such that the 5% subcriticality margin is maintained.	The AMP “Boraflex Monitoring” (XI.M22, NUREG-1801, Vol. 2) states that corrective actions are initiated if the test results find that the 5% subcriticality margin cannot be maintained because of the current or projected future degradation. Corrective actions consist of providing additional neutron absorbing capacity by Boral or boron steel inserts or other options that are available to maintain a 5% subcriticality margin. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIA2-6	VII A2-5	Recommend changing "BADGER" to Areal Density measurements.	The term is more generic and permits the use of new equipment and technologies.	The AMP "Boraflex Monitoring" (XI.M22, NUREG-1801, Vol. 2) includes: (1) performing neutron attenuation testing, (2) sampling and analysis for silica levels in the spent fuel pool water and trending the results using the EPRI RACKLIFE code or its equivalent and, (3) measuring boron areal density by a device such as BADGER. The GALL report was revised to address this comment.
G-VIIA2-7	VII A2-7	Provide operating experience that justifies the effectiveness of the program.	Section A.1.2.3.10, page A.1-6 of draft SRP states "This information should provide objective evidence to support that the effects of aging will be adequately managed so that the structure and component intended function(s) will be maintained during the period of extended operation."	The description of operating experience has been expanded in the AMP "Boraflex Monitoring" (XI.M22, NUREG-1801, Vol. 2) to provide objective evidence that the program is effective by stating that the AMP will ensure that the boral sheets will maintain their integrity and will be effective in performing their intended function. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIA3-1	A3.1.1, A3.5.1	Delete reference to ASME Section XI as a technique for detecting boric acid corrosion.	Refer to comments in Chapter XI.M5 for justification	NRC GL 88-05 provides a stand-alone program for inspection of carbon steel structures and components for evidence of boric acid leakage and corrosion. Inservice inspection that detects leakage identified during the performance of pressure tests and hydrostatic tests are required by the ASME Code and are performed independent of the AMP "Boric Acid Corrosion" (XI.M10, NUREG-1801, Vol. 2) and were removed. The GALL report was revised to address this comment.
G-VIIA3-2	A3.2.1, A3.3.1, A3.5.1, A3.5.2	The material column refers to "carbon steel (CS) with lining." It is not clear what type of lining material is intended by this description. If the lining material is stainless steel, then pitting and crevice corrosion should be deleted from this table.	The introduction of system operation (Page VII A3-3) states that stainless steel components are not subject to significant aging degradation in borated water and are not considered further. In addition, further evaluation is not warranted.	Pitting and crevice corrosion are aging mechanisms of concern only following degradation of the lining protecting the CS. Additional line items were added to represent the degradation of elastomer linings for filter housings and for ion exchangers. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIA3-3	A3.3.1	The material column refers to "carbon steel (CS) with stainless steel (SS) cladding." Stainless steel is not subjected to significant aging degradation in a borated water environment and should be deleted from this table.	The introduction of system operation (Page VII A3-3) states that stainless steel components are not subject to significant aging degradation in borated water and are not considered further. Also, further evaluation is not warranted.	Stainless steel is subject to SCC in the presence of impurities. There have been instances of failures in spent fuel pool cleanup system. Instances of cracking in PWR piping have included piping from borated water storage tank to RHR suction, spent fuel cooling piping, etc. (NUREG–0691, 1980). Additionally, IGSCC was observed in PWR safety injection accumulator nozzles (NRC IN 91-05). SS can be subject to SSC in a borated water environment. The GALL Report was not revised to address this comment.
G-VIIA3-4	A3.4.1, A3.4.2	Delete reference to ASME OM Standards and Guides, Part 2 from this table. Add "If the adequacy of the chemistry control programs cannot be confirmed over the total operating history of the plant or if any unexplained downward trend in heat exchanger performance is identified that cannot be remedied by maintenance of an open-cycle system, it may be necessary to selectively perform functional testing of the affected heat exchangers."	Refer to comments in Chapter XI.M4 for justification.	See NRC disposition of NEI comment G-VIII E-5 in this Appendix B, Table B.2.7. The AMP "Closed-Cycle Cooling Water" (XI.M21, NUREG-1801, Vol. 2), element 5 "Monitoring and Trending" provides for the performance and functional test intervals to be adjusted by the applicant. The GALL report was not revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIA3-5	A3.5.1-A.3.5.3	Add external surfaces to the Region of Interest column.	Consistent with other item numbers that are exposed to air and leaking chemically treated borated water.	The external surfaces of the shell and nozzles in the demineralizer ion exchanger are exposed to air and leaking chemically treated borated water. The component is identified as external surface only. The GALL report was revised to address this comment.
G-VIIA3-6	A3.1.1-A3.2.1, A3.2.2, A3.3.1-A3.3.2, A3.4.1-A3.4.3, A3.5.1-A3.5.3, A3.6.1	Delete line items.	All carbon steel external surfaces, including closure bolting exposed to atmospheric air and chemically treated borated water are evaluated under Chapter VII I – Carbon Steel Components.	The components in the spent fuel pool cooling and cleanup (PWR) contain chemically treated borated water, which may leak out of them. The components in the carbon steel components section have chemically treated borated water leaking onto them. The GALL report was revised to address this comment to clarify that the carbon steel components considered do not contain borated water, by adding a phrase both in the system structure and component description as well as in the table itself of the carbon steel components section.
G-VIIA3-7	System Interface	Include a reference to Section VII I (Carbon Steel Components) for the external surfaces of piping in each specific section's System Interface paragraph.	The external surfaces of piping etc. is included in the scope of Carbon Steel Components (VII I). The link between Carbon Steel Components and the individual sections is not clearly established in the System Interface sections of the individual sections.	See NRC disposition of NEI comment G-VII-1 in this Appendix B, Table B.2.6.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIA3-8	A3.4.1, A3.4.2	Remove reference to MIC.	Treated Closed Cycle Cooling Water is not susceptible to MIC.	Carbon steel components exposed to chemically treated closed-cycle cooling water are not susceptible to microbiologically influenced corrosion because treated CCCW is not amenable to biological growth. The GALL report was revised to address this comment by deleting this aging mechanism for CS components in the PWR spent fuel pool cooling and cleanup system.
G-VIIA4-1	A4.1.1, A4.2.1, A4.3.1, A4.4.2-A4.4.4, A4.5.1, A4.5.2, A4.6.1	See comments on AMP for "Water Chemistry" in Chapter XI.M.11.	See comments on AMP for "Water Chemistry" in Chapter XI.M.11.	The section on one-time inspection in Element 4, Detection of Aging Effects, in the AMP "Water Chemistry" (XI.M2, NUREG-1801, Vol. 2), was clarified. One time inspection is needed to verify the effectiveness of water chemistry control and confirm the absence of an aging effect. If an aging effect is detected, the results are evaluated to determine the appropriate corrective actions. The reference to the "appendix to this report" was made clearer and the GALL Report was revised to address this comment.
G-VIIA4-2	A4.4.1-A4.4.3	See comments on AMP for "Closed cycle cooling water system" in Chapter XI.M.4.	See comments on AMP for "Closed cycle cooling water system" in Chapter XI.M.4.	See NRC disposition of NEI comment G-VIII E-5 in this Appendix B, Table B.2.7.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIB-1	B.1.1	Remove reference to "Coating Degradation."	"Coating Degradation" is not a mechanism, but General Corrosion is. The condition of the coating does not directly affect the intended function, only indirectly through the other listed mechanism.	The structural girders for cranes including bridge and trolley are subject to general corrosion. Because the condition of the coating does not directly affect the intended function, coating degradation was deleted as an aging mechanism of concern for auxiliary systems. Coatings are covered under the maintenance rule. The GALL report was revised to address this comment.
G-VIIB1-2	VIIB1, page VIIB-3	The text under system interfaces should be changed to the following: Physical interfaces exist with the supporting structure. The direct interface is at the connection to the structure.	Editorial clarification.	The text following the system interfaces caption on the introductory page was revised to include the following sentence: "Physical interfaces exist with the supporting structure. The direct interface is at the connection to the structure." The GALL report was revised to address this comment.
G-VIIB1-3	VIIB1.1, page VIIB-4	Structure and component should be listed as Cranes.	Bridge and trolley are subcomponents of the larger component, which is a crane.	The structural girders for cranes including bridge and trolley are subject to general corrosion. The structure and component are now listed as Crane, denoting that bridge and trolley are the subcomponents. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIB1-4	VIIB1.1, page VIIB-4	Delete ASME Section XI under reference for general corrosion.	The structural girders are not inspected in accordance with ASME.	The AMP "Inspection of Overhead, Heavy Load and Light Load Handling Systems" (XI.M23, NUREG-1801, Vol. 2) was revised so that references to ASME Section XI and ANSI N14.6 were deleted because ASME Section XI does not apply to crane structures and ANSI N14.6 applies to lifting devices rather than the cranes themselves. The GALL report was revised to address this comment.
G-VIIB1-5	VIIB1.1, page VIIB-5	(1) Aging Management Program should reflect CMAA Specifications #67 or #70. (2) Additional information such as cycles and CUF needs to be moved under evaluation and technical basis. (3) Further evaluation should say, "Yes, TLAA if applicable."	ASME NOG-1 is not a utility applied reference. Editorial clarification.	(1) The AMP "Inspection of Overhead, Heavy Load and Light Load Handling Systems" (XI.M23, NUREG-1801, Vol. 2) was revised to add the following CMAA documents (specification applicable at the time the crane was manufactured should be used). The Electric Overhead Crane Institute, Inc., EOCI Specification No. 61, Specifications for Electric Overhead Traveling Cranes (note that this is CMAA#61; CMAA#67 was a typo). Crane Manufactures Association of America, Inc., CMAA Specification No. 70, Specifications for Electric Overhead Traveling Cranes. Crane Manufactures Association of America, Inc., CMAA Specification

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIB1-5 (cont.)				No. 74, Specifications for Top Running and Under Running Single (contd) Girder Electric Overhead Traveling Cranes. (2) The AMP "Inspection of Overhead, Heavy Load and Light Load Handling Systems" (XI.M23, NUREG-1801, Vol. 2) was revised to include only aging management of aging effects due to general corrosion and wear. (3) Fatigue is a TLAA to be evaluated for the period of extended operation in accordance with 10 CFR 54.21 requirements. The license renewal applicant only has to demonstrate compliance with the original licensing basis design criteria for 60-years. If the criteria did not include a fatigue evaluation, the applicant does not have to perform one. The GALL report was not revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIB1-6	VIIB1.1, page VIIB-5	Aging Management Program, delete information on ASME code Section XI for VT-3.	The structural girders are not inspected in accordance with ASME Section XI.	The AMP "Inspection of Overhead, Heavy Load and Light Load Handling Systems" (XI.M23, NUREG-1801, Vol. 2) was revised. References to ASME Section XI, and ANSI N14.6 were deleted because ASME Section XI does not apply to crane structures and ANSI N14.6 applies to lifting devices rather than the cranes themselves. The GALL report was revised to address this comment.
G-VIIB1-7	VIIB1.1, page VIIB-5	Delete information on coating degradation under AMP column.	ASME Section XI and Coating inspections are not credited for managing the aging of cranes. Only the crane inspection or Maintenance Rule inspections are credited with managing aging of cranes.	The structural girders for cranes including bridge and trolley are subject to general corrosion. Because the condition of the coating does not directly affect the intended function, coating degradation was deleted as an aging mechanism of concern for auxiliary systems. Coatings are covered under the Maintenance Rule. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIB1-8	VIIB1.1, page VIIB-5	Revise Attributes 1 – 6 as follows: **(1) Scope of Program:** The program is focused on managing the effects of general corrosion on the girders. **(2) Preventive Actions:** No preventive actions are identified. The Crane inspection is a monitoring program.) **(3) Parameters Monitored/Inspected:** OK as is. **(4) Detection of Aging Effects:** Rails and girders are visually inspected on a routine basis for degradation. Functional tests are also performed to assure their integrity. **(5) Monitoring and Trending:** Monitoring and trending are not required as part of the crane inspection program. **(6) Acceptance Criteria:** The acceptance criteria are no unacceptable visual indication of loss of material due to corrosion or wear.	The attributes are changed to more correctly reflect the program. This statement matches how other preventive actions are addressed when it is a monitoring program. Changes are recommended because girders are not inspected in accordance with ASME. This matches how cranes are addressed in NUREGs 1705 and 1723. The statement in the GALL does not contain any acceptance criteria. These are the criteria that were accepted in NUREG 1723 for managing this aging effect.	The AMP "Inspection of Overhead, Heavy Load and Light Load Handling Systems" (XI.M23, NUREG-1801, Vol. 2) was significantly revised. In Element (1), the words "cyclic loading" and "structural reliability" were deleted because it is not in scope. Element (2) "preventive actions" was revised because it is an inspection program. Element (4) "Detection of Aging Effects" was revised because ASME Section XI does not apply to cranes. Element (5) "Monitoring and Trending" was not revised to address this comment because it is not in scope. Element (6) "Acceptance Criteria" was revised with the addition of the phrase at the end "according to applicable industry standards and good industry practice." The GALL report was revised to address this comment as stated above.
G-VIIB1-9	VIIB1.1, page VIIB-4, and VIIB.2.1, page VIIB-6	Environment should be changed to 100% relative humidity and 49°C.	Many locations within the plant are exposed to relative humidity as high as 100%.	Many locations within the plant are exposed to relative humidity as high as 100%. The GALL report was revised to address this comment, by changing the listed environment to 100% relative humidity and 49°C (120°F).

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIB1-10	VIIB.2.1, page VIIB-6 and VIIB-7	Delete “and coating degradation” under references, AMP and evaluation and technical basis.	Coating degradation does not in and of itself result in loss of material of the rail system. Corrosion results in loss of material.	The condition of the coating does not directly affect the intended function. Coatings are covered under the Maintenance Rule. The GALL report was revised to address this comment by deleting coating degradation as an aging mechanism for auxiliary systems.
G-VIIC1-1	System Description	Revise sentence addressing Regulatory Guide 1.26 as follows: Based on the Nuclear Regulatory commission Regulatory guide 1.26, “Quality Group Classifications and Standards for Water, Steam, and Radioactive Waste Containing components of Nuclear Power Plants”, all components in the open cycle cooling water system are classified as Group “C” quality Standards, with the exception of those forming part of the containment penetration boundary which are Group “B.”	Since scope of Section VII C2 now also includes containment isolation portion of system, Quality Group classification requires clarification.	The Quality Group classification was clarified by using the following sentence: “Based on Regulatory Guide 1.26, Quality Group Classifications and Standards for Water, Steam, and Radioactive Waste Containing Components of Nuclear Power Plants,” all components in the open-cycle cooling water system are classified as Group “C” Quality Standards, with the exception of those forming part of the containment penetration boundary which are Group “B.” The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIC1-2	System Interfaces Section	Change wording to indicate …systems that "may" interface with the open cooling water system…	Many plants have a closed cooling water system that interfaces with the system listed.	The system interfaces paragraph in the introductory section for open-cycle cooling water system (service water system) was rewritten to indicate the systems that "may" interface with the open-cycle cooling water system (service water system). Many plants have an OCCW system that interfaces with the systems listed. The GALL report was revised to address this comment.
G-VIIC1-3	C1.1.1	Add stainless steel, as applicable material for open cycle cooling water systems (aboveground). The aging effects remain consistent with those items listed.	Stainless steel is used in many open-cycle cooling water systems in an effort to minimize the adverse effect of MIC.	Stainless steel is used in many OCCW systems to minimize the adverse effect of MIC. The GALL report was revised to address this comment by adding SS to the list of applicable materials for OCCW system (aboveground).
G-VIIC1-4	C1.1.1	Add galvanic corrosion to aging mechanism column.	The GALL Report identifies galvanic corrosion as being applicable only to piping exposed to a soil environment. This mechanism is also applicable to dissimilar metals in a raw water environment.	Galvanic corrosion is applicable to dissimilar metals in a raw water environment as well as to piping exposed to a soil environment. The GALL report was revised to address this comment by adding this aging mechanism for OCCW system (aboveground).

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIC1-5	C1.1.1, C1.2.1, C1.3.1 through C1.3.5	Add the following to the aging mechanism column "General (For CS **without internal lining or coating**)…"	General corrosion of lined carbon steel is listed as an aging mechanism. Lined carbon steel pipe may be susceptible to localized corrosion in areas of lining degradation but will not be susceptible to gross wastage. This position was accepted in the CCNPP SER. In addition, this proposed change would ensure consistency with GALL Section VII C3, Item C3.1.1.	General corrosion is applicable for CS without an internal lining or coating or for CS with a degraded internal lining or coating. Lined carbon steel pipe may be susceptible to localized corrosion in areas of lining degradation. The GALL report was revised to address this comment.
G-VIIC1-6	C1.1.2	Add cast iron to material column and de-alloying as specific aging mechanism for only cast iron.	Cast iron piping is a probable material type for underground piping.	Cast iron was added as a material of concern for underground piping and fittings (external surface, with or without organic coating or wrapping) and aluminum-bronze was added for piping and fittings in OCCW systems (service water system) and selective leaching was identified as the specific aging mechanism. This term is used throughout GALL because it is the standard terminology for the process (and includes dealloying as a subset of selective leaching). The AMP "Selective Leaching of Materials" (XI.M33, NUREG-1801, Vol. 2) was created and inserted. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIC1-7	C1.1.2	Delete reference to the AMA titled "Outer Surface of Buried Piping and Components."	Refer to Chapter XI.M8 comments.	The AMP "Buried Piping and Tanks Surveillance" (XI.M28, NUREG-1801, Vol. 2) manages the aging of buried carbon steel piping. Although the Buried Piping and Tanks Surveillance AMP (based on NACE standards) is not an existing nuclear industry standard practice, it is one acceptable method. An alternative to the AMP "Buried Piping and Tanks Surveillance" (XI.M28, NUREG-1801, Vol. 2) is found in the AMP "Buried Piping and Tanks Inspection (XI.M34, NUREG-1801, Vol. 2) which inspects based on the frequency for the need to dig up piping considering plant operating experience that would allow for crediting the inspection when a pipe is dug up for any reason. The frequency and plant operating experience could be subject to a plant specific review. The GALL report was revised to address this comment.
G-VIIC1-8	C1.1.1, C1.2.1, C1.4.1, C1.5.1, C1.6.1	Eliminate Buildup of deposit/Flow Blockage as an aging effect and Biofouling as an Aging mechanism for all components except heat exchanger tubes.	Buildup of deposit due to biofouling is an aging effect which impacts heat transfer intended function, and is thus documented only for heat exchanger tubes. Buildup of deposit does not affect pressure boundary, except for MIC, which is addressed under loss of material.	Biofouling affects both system flow performance and pressure boundary integrity. Flow performance is considered an active function covered under the current licensing basis and should not be included within the scope of license renewal. However, biofouling causes loss of material, which affects the pressure boundary and this passive function

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIC1-8 (cont.)				requires aging management. This position does not contradict License Renewal Issue No. 98-105, which states that the heat transfer function for heat exchangers is within the scope of license renewal. Therefore, biofouling of heat exchanger tubes requires aging management. The GALL report was revised as follows to address this comment: 1. Delete all heat exchanger components except the tubes from the material column for buildup of deposits due to biofouling. 2. For all piping and components other than heat exchangers, deleted all line items for buildup of deposits due to biofouling. 3. For all piping and components including heat exchangers, loss of material due to biofouling was included as an aging mechanism for pressure boundary components. 4. The aging management program XI.M20 “Open-Cycle Cooling Water System” was revised to remove reference to flow blockage.
G-VIIC1-9	C.1.3.1 through C.1.3.5	Add: Aluminum Brass material for heat exchanger tubes. All other columns remain the same.	Some plants utilize aluminum brass heat exchanger tubes.	Since aluminum brass is used in heat exchanger tubes in some plants, the material was added. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIC1-10	C1.4.1	Remove references to General Corrosion.	General Corrosion is listed as an Aging Mechanism for Stainless Steel Flow Orifices. Stainless Steel is not susceptible to General Corrosion, so this Aging Mechanism should not be considered.	Flow orifice bodies serviced by OCCW system are SS. Stainless steel is not susceptible to general corrosion. The GALL report was revised to address this comment by clarifying that the aging mechanisms of concern are pitting, crevice, and microbiologically influenced corrosion and biofouling.
G-VIIC1-11	C1.5.1	Add cast steel to the Material column.	To be consistent with the same item under different aging effect.	The pump casing in an OCCW system can be fabricated from cast steel or carbon steel. The GALL report was revised to address this comment by making GALL consistent with the same item specified under different aging effect.
G-VIIC1-12	C1.5.1	Remove “low flow cavitation” as an aging mechanism.	Cavitation Erosion is localized material erosion caused by formation and collapse of vapor bubbles in close proximity to material surface. Fluid (liquid) flow and pressure variations, which temporarily drop the liquid pressure below the corresponding vapor pressure, are required for this mechanism. Cavitation Erosion does not occur in liquid systems that have low flow and steady pressure, such as open cycle cooling water systems, because there are not significant flow and pressure variations.	The pump casing in an OCCW system can be fabricated from cast steel or carbon steel and can experience loss of material due to general, selective leaching, pitting, crevice, and microbiologically influenced corrosion and biofouling. Because there is no significant flow and pressure variations in OCCW systems, low flow cavitation is not a viable aging mechanism. The GALL report was revised to address this comment by deleting this aging mechanism for the OCCW in Auxiliary Systems.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIC1-13	C1.6.1	Apply general corrosion only to the carbon steel material as an applicable aging mechanism.	Stainless steel is not susceptible to general corrosion.	Basket strainer bodies serviced by open-cycle cooling water are fabricated from either CS or SS. Because the SS component is not susceptible to general corrosion. The GALL report was revised to address this comment by clarifying that only CS components are subject to this aging mechanism and that both SS and CS components are susceptible to pitting, crevice and microbiologically influenced corrosion and biofouling.
G-VIIC1-14	System Interface	Include a reference to Section VII I (Carbon Steel Components) for the external surfaces of piping in each specific section's System Interface paragraph.	The external surfaces of piping etc. is included in the scope of Carbon Steel Components (VII I). The link between Carbon Steel Components and the individual sections is not clearly established in the System Interface sections of the individual sections.	See NRC disposition of NEI comment G-VII-1 in this Appendix B, Table B.2.6.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIC2-1	System Description	Revise sentence addressing Regulatory Guide 1.26 as follows: "Based on the Nuclear Regulatory commission Regulatory guide 1.26, "Quality Group Classifications and Standards for Water, Steam, and Radioactive Waste Containing components of Nuclear Power Plants," all components in the closed cycle cooling water system are classified as Group "C" quality Standards, with the exception of those forming part of the containment penetration boundary which are Group "B."	Since scope of Section VII C2 now also includes containment isolation portion of system, Quality Group classification requires clarification.	The Quality Group classification was clarified by using the following sentence: "Based on Regulatory Guide 1.26, "Quality Group Classifications and Standards for Water, Steam, and Radioactive Waste Containing Components of Nuclear Power Plants," all components in the closed-cycle cooling water system are classified as Group "C" Quality Standards, with the exception of those forming part of the containment penetration boundary which are Group "B". The GALL report was revised to address this comment.
G-VIIC2-2	C2.1.1	Delete reference to ASME OM Part 2. Add: "If the adequacy of the chemistry control programs cannot be confirmed over the total operating history of the plant or if any unexplained downward trend in heat exchanger performance is identified that cannot be remedied by maintenance of an open-cycle system, it may be necessary to selectively perform functional testing of the affected heat exchangers.	Refer to comments in Chapter XI.M4 for justification.	See NRC disposition of NEI comment G-VIIA3-4 in this Appendix B, Table B.2.6.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIC2-3	C.2.2.1	(1) Need to add Stainless material for valves. (2) Revise Aging Mechanism Column by adding "(carbon steel only)" after General corrosion.	Some plants also utilize stainless steel valves in their closed cooling water systems. The Closed Cooling Chemistry Program addresses the aging effects of stainless steel.	(1) It is correct that some plants also use SS valves in CCCW systems. (2) The SS valve body and bonnet are not susceptible to general corrosion. The GALL report was revised to address this comment by adding SS as a material of consideration for valves and clarifying that only CS components are subject to this aging mechanism.
G-VIIC2-4	C.2.3.1	Need to add Cast Iron material for Pump Casing. Also add "Dealloying (Cast iron only)" to Aging Mechanism Column. No other changes are required to remaining columns.	Some plants also utilize cast iron material for pumps in their closed cooling water systems. The Closed Cooling Chemistry Program addresses the aging effects of cast iron.	Some plants use cast iron pumps in CCCW systems. Selective leaching is an aging mechanism of concern for cast iron and is addressed by the AMP "Selective Leaching of Materials" (XI.M34, NUREG-1801, Vol. 2). The GALL report was revised to address this comment by adding cast iron as a material of consideration for pump casings.
G-VIIC2-5	C.2.5.1	Need to add Stainless material for flow orifice. No other changes are required to columns.	Some plants also utilize stainless steel orifices in their closed cooling water systems. The Closed Cooling Chemistry Program addresses the aging effects of stainless steel.	SS has no aging effect in the closed cooling water system environment. The GALL report was not revised to address this comment.
G-VIIC2-6	C2.4.1, C2.5.1	Add general corrosion to aging mechanism column.	General corrosion should be added in a manner similar to other equipment in this section.	General corrosion is applicable for CS in treated water. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIC2-7	C2.6.1	This row is incomplete. The Reference and AMP column are blank. In addition, the index page (VII C2-1) for section C2 does not show this item number.	Provide information in the appropriate columns and the index page **OR** remove and include lube oil cooler in the appropriate auxiliary system as stated in the second paragraph under "System, Structures, and Components" on page VII C2-3.	There was only one failure event of the lube oil cooler attributable to IGSCC in the entire U.S. nuclear power plant history. The event occurred at Fort Calhoun in 1973. The GALL report was revised to address this comment by deleting this line item.
G- VIC2-8	System Interface	Include a reference to Section VII I (Carbon Steel Components) for the external surfaces of piping in each specific section's System Interface paragraph.	The external surfaces of piping etc. is included in the scope of Carbon Steel Components (VII I). The link between Carbon Steel Components and the individual sections is not clearly established in the System Interface sections of the individual sections.	See NRC disposition of NEI comment G-VII-1 in this Appendix B, Table B.2.6.
G-VIIC3-1	C3.1.1, C3.2.1	Change aging mechanism from "selective leaching" to "dealloying" in the aging mechanism and AMP columns.	To ensure consistency between GALL sections VII C1 and VII C3.	Brass, bronze, and cast iron are subject to a selective leaching aging mechanism. This term is used throughout GALL because it is the standard terminology for the process (and includes dealloying as a subset of selective leaching). All references to dealloying in the GALL report have been changed to selective leaching. The GALL report was not revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIC3-2	C3.1.1, C3.2.1, C3.3.1	Add a comma after "Raw" in the environment column and "Untreated Salt Water."	To ensure consistency between GALL sections VII C1 and VII C3.	A comma was added after "Raw" in the environment column and "Untreated Salt Water" in order to have consistency between sections. The GALL report was revised to address this comment.
G-VIIC3-3	C3.2.1	Add carbon steel to the material column and general corrosion (for CS only without internal lining or coating) to the aging mechanism column.	To ensure consistency between GALL sections VII C1 and VII C3 and the AMP column.	Global changes were made throughout Ch. VII to ensure consistent descriptions for coatings, linings (elastomer) and claddings (SS). The GALL report was revised to address this comment.
G-VIIC3-4	C3.3.1	Revise the AMP column and the Evaluation and Technical Basis column to delete any reference to selective leaching for brass.	Brass material is not included in the material column of this Item number.	The selective leaching of the material "brass" was deleted from consideration in this environment. The GALL report was revised to address this comment.
G-VIIC3-5	System Interface	Include a reference to Section VII I (Carbon Steel Components) for the external surfaces of piping in each specific section's System Interface paragraph.	The external surfaces of piping etc. is included in the scope of Carbon Steel Components (VII I). The link between Carbon Steel Components and the individual sections is not clearly established in the System Interface sections of the individual sections.	See NRC disposition of NEI comment G-VII-1 in this Appendix B, Table B.2.6.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIID-1	System Description	Revise sentence addressing Regulatory Guide 1.26 as follows: "Based on the Nuclear Regulatory commission Regulatory guide 1.26, "Quality Group Classifications and Standards for Water, Steam, and Radioactive-Waste Containing components of Nuclear Power Plants," all components of the compressed air system are classified as Group "D" quality Standards, with the exception of those forming part of the containment penetration boundary which are Group "B."	Since scope of Section VII D now also includes containment isolation portion of system, Quality Group classification requires clarification.	The Quality Group classification was clarified by using the following sentence: "Based on Regulatory Guide 1.26, "Quality Group Classifications and Standards for Water, Steam, and Radioactive-Waste Containing Components of Nuclear Power Plants," all components of the compressed air system are classified as Group "D" Quality Standards, with the exception of those forming part of the containment penetration boundary which are Group "B." The GALL report was revised to address this comment.
G-VIID-2	D.1.1, D.2.1 through D.2.3, D.3.1, D.4.1 through D.4.3	Replace "Internal: Dry, Oil-Free Air" with "Saturated Air".	Dry, Oil-Free Air is not an aggressive environment conducive to aging effects for carbon and low alloy steels; however, moist or saturated air is. Saturated or moist air conditions should exist only upstream of air dryers in typical compressed air system. Plants have addressed air quality issues downstream of dryers per their response to GL 88-14. These responses included many one-time verifications of proper system design, and also assuring adequate maintenance/operating practices: 1) Verification that actual instrument air quality is consistent with manufacturers recommendations for safety related components, 2)	The environment to which components of the compressed air system are exposed progresses from saturated air at the piping and fittings to merely moist air at the dryer. The AMP "Compressed Air Monitoring" (XI.M24, NUREG-1801, Vol. 2) reflects the cleanup of air as it proceeds through filters and dryers. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIID-2 (cont.)			Verification that maintenance practices, emergency procedures, and training are adequate, and 3) Verification that the design of the entire system including air or other pneumatic accumulators is in accordance with its intended function. Note: This included testing of air operated valves. Compressed air systems having design features such as air dryers and filters typically have dew point alarms and/or dew point is tested periodically by the operators as part of their routine monitoring of the equipment. This should not be considered as an aging management program. Aging management activities or programs should only be provided for "saturated air" portion of the system upstream of air dryers. These components are subject to internal general and pitting corrosion. However, because of differences in system design and management philosophy, these aging management activities should be evaluated on a plant specific basis.	

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIE1-1	E1.6.1, E1.6.2	Delete E1.6.1 from Item column and delete Casing from Region of Interest column for BAC Aging Mechanism.	The Low Pressure Pump Casing (item E1.6.1) is stainless steel and not subject to BAC.	The low-pressure pump casing, fabricated from stainless steel, is not susceptible to boric acid corrosion. The casing was deleted as a region of interest. The GALL report was revised to address this comment.
G-VIIE1-2	E1.7.1 through E1.7.4 (p. E1-8)	Change Material from LAS, CS to stainless steel.	The Regenerative Heat Exchanger has a borate water for both shell and tube side and is made of stainless steel not carbon steel.	The regenerative heat exchanger is fabricated only of stainless steel. The closure bolting is fabricated from the LAS and CS materials. The GALL report was revised to address this comment.
G-VIIE1-3	E1.10.1 through E1.10.4 (really E1.10.2 through E1.10.4)	Delete this item.	The Volume Control Tank is made of stainless steel not carbon steel. The listed Aging Mechanism is not valid for stainless steel and borated water.	The volume control tank, constructed only of SS, is not susceptible to pitting and crevice corrosion in borated water. The volume control tank closure bolting, fabricated of LAS or CS, was retained as a topic of concern in Section E1 because of possible boric acid corrosion. The GALL report was revised to address this comment by deleting the line items E1.10.2 through E1.10.4 (shell and access cover, nozzle, and penetration).
G-VIIE1-4	E1.10.1 through E1.10.4	If comment G-VII E1-3 above is not incorporated, Change “Pitting and Crevice Corrosion” to “BAC”.	This entry seems inconsistent with all other entries on leaking Borated Water.	See NRC disposition of NEI Comment G-VIIE1-3 in Appendix B, Table B.2.6.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIE1-5	E1.7.1 through E1.7.4	Delete the Aging Mechanism 'Unanticipated cyclic loading'.	Unanticipated cyclic loading is not a valid Aging Mechanism.	The term "unanticipated" was eliminated because if a mechanism is not anticipated, then it cannot be managed in anticipation. The GALL report was revised to address this comment.
G-VIIE1-6	E1.8.1 through E1.8.3	Delete the Aging Mechanism 'Unanticipated cyclic loading.'	Unanticipated cyclic loading is not a valid Aging Mechanism.	The term "unanticipated" was eliminated because if a mechanism is not anticipated, then it cannot be managed in anticipation. The GALL report was revised to address this comment.
G-VIIE1-7	E1.5.1, E1.5.2, E1.6.1, E1.6.2	Delete the Aging Mechanism Fatigue.	Fatigue is listed as an Aging Mechanism for the Low Pressure and High Pressure Pump. These components are not subjected to high temperatures or thermal cycles that could cause Fatigue; this Aging Mechanism should not be listed for these items.	Temperatures and thermal cycles are relatively benign, fatigue has been deleted as an aging mechanism for the low-pressure and high-pressure pumps in the chemical and volume control system for PWRs. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIE1-8	E1.2.1	Delete the Aging Mechanism stress corrosion cracking.	Low Pressure Piping Stress Corrosion Cracking identifies the Environment as External with Heat Tracing and internal with treated water. The Region of Interest is identified as Low Pressure Piping up to 100°C. The use of adhesives with halogens would appear to be a 'Degradation induced by human activities' (Generic Licensing Renewal Issue # 98-0013) and not a real Aging concern.	Pipe, fittings, and flanges for 150psig rating piping have been deleted as components of concern. The SCC aging mechanism for low-pressure piping was deleted because the use of adhesives with halogens can cause 'Degradation induced by human activities' (Generic Licensing Renewal Issue # 98-0013) which is not a real aging concern. The GALL report was revised to address this comment.
G-VIIE1-9	E1.4.1	Delete the Aging Mechanism stress corrosion cracking.	Low Pressure Valves Stress Corrosion Cracking identifies the Environment as External with Heat Tracing and internal with treated water. The Region of Interest is identified as Low Pressure Piping up to 100°C. The use of adhesives with halogens would appear to be a 'Degradation induced by human activities' (Generic Licensing Renewal Issue # 98-0013) and not a real Aging concern.	The SCC aging mechanism for low-pressure valves was deleted because the use of adhesives with halogens can cause "Degradation induced by human activities" (Generic Licensing Renewal Issue # 98-0013), which is not a real aging concern. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIE1-10	E1.1.2	Remove all references to ISI for managing Boric Acid Corrosion.	See justification for comment on item XI.M5.	NRC GL 88-05 provides a stand-alone program for inspection of carbon steel structures and components for evidence of boric acid leakage and corrosion. Inservice inspection that detects leakage identified during the performance of pressure tests and hydrostatic tests are required by the ASME Code and are performed independent of the AMP "Boric Acid Corrosion" (XI.M10, NUREG-1801, Vol. 2) and were removed. The GALL report was revised to address this comment.
G-VIIE1-11	E1.7.1 through E1.7.4, E1.8.1 through E1.8.3	Delete entry for Crack Initiation and Growth.	This AE, shown as resulting from "SCC, Unanticipated Cyclic Loading" has been added since the original draft. No reference is provided to justify the inclusion of these mechanisms. In addition, "Unanticipated Cyclic Loading" is not clearly defined. This AE/AM combination was not identified in the first two LRAs.	Crack initiation and growth are legitimate aging effects caused by SCC and cyclic loading acting on SS regenerative heat exchangers in a PWR chemical and volume control system. The term "unanticipated" was eliminated because if a mechanism is not anticipated, then it cannot be managed in anticipation. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIE1-12	E1.10.2 through E1.10.4	Make this entry consistent with the remainder of section VII.E1. Both the inclusions of the AE/AM combination and the credited program seem inconsistent with other entries.	AE/AM: Loss of Material/Pitting and Crevice Corrosion is not included as an external effect for other CS/LAS components. Programs: For Loss of Material/Pitting and Crevice Corrosion, this entry refers to a previous entry for the same AE/AM for item VII E1.8.4. The previous item credits the Closed Cycle Cooling Water Chemistry program, which applies to neither external nor borated water environments.	The volume control tank, constructed only of SS, is not susceptible to pitting and crevice corrosion in borated water, the line items E1.10.2 through E1.10.4 (shell and access cover, nozzle, and penetration) were deleted. The volume control tank closure bolting, fabricated of LAS or CS, was retained as a topic of concern in Section E1 because of possible boric acid corrosion. The GALL report was revised to address this comment.
G-VIIE2-1	E2.1.1	Under element 3 of Evaluation and Technical Basis, delete the second sentence and replace with, "Inspection requirements of IWC 2500-1 specify periodic volumetric or surface examination of welds in class 2 components."	As stated in our previous comments sent to the NRC, the category references like category C-A or C-F-1 are only applicable to the 1989 Edition of ASME Section XI. These categories may be deleted or changed to something else in later editions. The AMP should be based on ASME Section XI requirements for class 2 components, period.	Stainless steel is subject to SCC in the presence of impurities. There have been instances of failures in spent fuel pool cleanup system. Cracking instances in piping in PWRs were studied in NUREG-0691 (1980). Affected systems included piping from borated water storage tank to RHR suction, spent fuel cooling piping, etc. An appropriate AMP is "Water Chemistry" (XI.M2, NUREG-1801, Vol. 2). The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
GVIIE2-2	Entire section	Typos in the Material and environment columns require correction.	These typos make an evaluation of the material presented in the other columns difficult.	Structures and components of the standby liquid control system in BWRs are subjected to an environment consisting of a sodium pentaborate solution at 21-32°C (70-90°F) and ~ 24,500 ppm B). The GALL report was revised to address this comment.
GVIIE2-3	E2.1.1	Environment temperature ranges do not agree. SCC ranges should be from 93ºC to 194ºC.	SCC is not an appropriate aging effect for the internal surfaces of these components when their normal operating temperature is less than 200°F (93ºC).	Even at lower temperatures of 21-32°C (70-90°F), stainless steel is subject to SCC in the presence of impurities. There have been instances of failures in spent fuel pool cleanup system. Cracking instances in piping in PWRs were studied in NUREG–0691 (1980). Affected systems included piping from borated water storage tank to RHR suction, spent fuel cooling piping, etc. An appropriate AMP is “Water Chemistry” (XI.M2, NUREG-1801, Vol. 2). The range over which a particular aging mechanism is active can not be accurately stated since it cannot be accurately predicted even if other variables are disregarded but if there are multiple active aging mechanisms at anyone time then that further complicates the predictability of the temperature range over which any one of those aging mechanisms is active. The GALL report was not revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
GVIIE2-4	E2.1.1	Specifically with respect to the piping that is downstream of the explosive valves and upstream of the containment isolation valves, errors in the table for materials (should be SS) and Environment (should be Treated Water or Demineralized water). Temperature range should be from 93ºC to 194ºC.	Higher temperatures are unlikely in this item. Also demineralized water is most often used to flush any part of this line, and the cleanliness requirements and chemical controls are at least as good as the treated water systems.	This section of piping and fittings is only exposed to ambient air, SCC does not occur and the line item was deleted. The GALL report was revised to address this comment.
GVIIE2-5	E2.1.1	AMP should be Chemistry Controls with resultant E&TB section.	This section of piping will receive the same treatment as any piping that could discharge water into the reactor vessel. Therefore, an acceptable AMP would be the AMP outlined in XI.M11.	Stainless steel piping and fittings in contact with sodium pentaborate solution (~ 24,500 ppm B) at 21-32°C (70-90°F) may be susceptible to stress corrosion cracking. An appropriate AMP is “Water Chemistry” (XI.M2, NUREG-1801, Vol. 2). The GALL report was not revised to address this comment.
GVIIE2-6	E2.2.1, E2.3.1, E2.4.1	The temperature range appears unusually high, especially for the storage tank. The temperature range should not exceed boiling (~100ºC). The low temperature for the range should be in keeping with the other comments of this section: 93ºC (200°F).	While high temperature spots around the heaters are possible, it is very unlikely that 302ºF would ever be reached. SCC is not a detrimental aging effect in components containing sodium pentaborate unless the mixing is inadequate and the temperature normally exceeds 200°F.	In the standby liquid control system in BWRs, the stainless steel solution storage tanks, the valve body and bonnets, and the injection pump casing are exposed to sodium pentaborate solution (~24,500 ppm B) at 21-32°C (70-90°C) and may be susceptible to stress corrosion cracking. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
GVIIE2-7	Item Missing, applies to E.2.1.1	Cracking due to thermal fatigue is not discussed in this section for piping and should be to be consistent with other sections.	Cracking due to thermal cycling induced fatigue will have been addressed through a TLAA for BWR plants. This section does not contain this aging effect and should to be consistent with other sections.	In the standby liquid control system in BWRs, the stainless steel pipings and fittings are exposed to either sodium pentaborate solution or demineralized reactor coolant (between the explosive actuated discharge valves and containment isolation valve). This is a rarely used system. Since this system is only used in emergencies, it does not experience cycling. The GALL report was not revised to address this comment.
GVIIE2-8	E2.1.1, E2.2.1, E2.2.2, E2.3.1, E2.4.1	Delete all entries for SCC.	Based on the operating experience presented in the Evaluation and Technical Basis entries, Items (4) and (10), it appears that these entries should be removed as the case is made that this Aging Mechanism will not occur.	Stress corrosion cracking (SCC) of stainless steel (SS) components exposed to borated water is possible at temperatures below 200°F if contaminants are present in the water. This is supported by operating experience at PWR plants (NRC IN 79-19, IE Bulletin 79-17). As suggested by NEI at a public meeting on 01/25/01, the staff reviewed the information in NUREG/CR-6001 and concurred that operating experience indicates that degradation does not occur if water chemistry is maintained. The aging management program was revised to rely solely on the water chemistry program. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
GVIIE3-1	All Items	This section should be deleted. (Comments below are provided in case this comment is not incorporated into GALL.)	The components in this section are not in scope of license renewal.	Even though the reactor water cleanup system can be isolated from the reactor water coolant system it is a pressure boundary concern during operation (NRC GL 88-01). Scoping for license renewal is plan specific. The GALL report is not a scoping document. The GALL report was not revised to address this comment.
GVIIE3-2	E3.1.1	Consistency issue: this item correctly identifies the temperature range for SCC in SS components. Other commodities in other sections do not.	SCC is not an applicable aging effect in non-saline solutions when the normal operating temperature is less than 200°F.	The temperature range for SCC in SS components was corrected to be consistent for comparable operating regimes throughout all of Chapter VII. The temperature will be in effect up to 550°F until the regenerative heat exchanger and then start decreasing. SCC was retained in GALL. The GALL report was revised to address this comment.
GVIIE3-3	E3.1.1	The lower limit of, “>93ºC,” should read, “Up to 288ºC (550°F)” for the line item dealing with Cumulative Fatigue Damage.	The basis for excluding piping that has thermal cycles from room temperature up to 93ºC is unclear. Depending upon the pipe geometry, low to moderate temperature cycling may be dominating in the pipe stress analysis.	Stainless steel piping and fitting, beyond the second isolation valve, in the BWR reactor water cleanup (RWCU) system, is exposed to oxygenated water at 93-288°C (200-550°F). The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
GVIIE3-4	E3.2.1	A lower limit should be placed on the temperature range for SCC in the pump casing. This limit should be 200°F.	NUREG-0313 provides a basis for 200°F as a lower limit. Given the high controls placed on the chemistry of the RWCU fluids, SCC is not an applicable aging effect for the pump casings that operate normally below 200°F.	The cast austenitic stainless steel RWCU pump casing is exposed to oxygenated water at 93-288°C (200-550°F). The GALL report was revised to address this comment.
GVIIE3-5	E3.2.2	SLAS should be spelled when first used.	Writing style comment.	Acronyms such as high strength low alloy steel (HSLAS) are defined when they are first used in each chapter of GALL. The GALL report was revised to address this comment.
GVIIE3-6	E3.2.1	A site-specific program should handle fatigue for the pump casing.	No CLB may exist for a TLAA on the pump casings. The design analysis is vendor specific and may not be a TLAA.	The comment that no current licensing basis (CLB) may exist for a TLAA on the pump casings may be valid for some of the older plants to the extent that a fatigue analysis may not have been required for these older plants. The license renewal applicant only has to demonstrate compliance with the original licensing basis design criteria for 60-years. If the criteria did not include a fatigue evaluation, then the applicant doesn't have to perform one. The GALL report was not revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
GVIIE3-7	E3.2.2	Delete entry for Stress Relaxation.	Stress Relaxation is the unloading of pre-loaded components caused by long term exposure to elevated temperatures and/or neutron irradiation. The stress in a member decreases when a constant amount of deformation is applied due to creep. Loss of prestress occurs at a decreasing rate; the majority of the loss is within the first year. The amount of prestress loss significantly decreases with time to approach an asymptotic value. Therefore, the level of prestress with extended operation should be comparable to current conditions. Proper component specification, design, and maintenance practices prevent this mechanism from occurring. Creep is not a concern for alloy and ferritic steels below 700ºF, for austenitic steels below 800ºF, and for nickel based alloys below 1800ºF. Creep is not generally a consideration in light water reactors due to operation at a maximum of 650ºF or below, which is somewhat below the creep range for most ASME Code materials. `	The high-strength low-alloy steel RWCU pump closure bolting will not be affected by stress relaxation at the operational temperature range. This entry was deleted. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
GVIIE3-8	E3.3.1 through E3.3.4	The line item addressing Crack Initiation and Growth for the Regenerative Heat Exchanger should be split into two items because the temperature limitations on the SCC mechanism are different from the cyclic loading mechanism.	SCC is not an applicable aging effect in non-saline solutions when the normal operating temperature is less than 200°F.	The stainless steel components of the regenerative heat exchanger are exposed to oxygenated water at a 288°C (550°F) maximum temperature and 10 MPa maximum pressure. Even by NEI's criteria (comment E2-3 in this same table), SCC should be considered a legitimate aging mechanism. The GALL report was not revised to address this comment.
GVIIE3-9	E3.3.1 through E3.3.4	Remove references to "Cyclic Loading".	"Cyclic Loading" is not a mechanism. SCC can be postulated to result in crack growth without consideration of "Cyclic Loading". Inclusion of "Cyclic Loading" adds no value to this entry.	Stress corrosion cracking of the stainless steel components of the regenerative heat exchanger in the BWR reactor water cleanup system results in crack initiation and growth. The term "cyclic loading" was deleted from consideration as an aging mechanism. The GALL report was revised to address this comment.
GVIIE3-10	E3.4.1 through E3.4.4	The line item addressing Crack Initiation and Growth for the Non-Regenerative Heat Exchanger should be split into two items because the temperature limitations on the SCC mechanism are different from the cyclic loading mechanism.	SCC is not an applicable aging effect in non-saline solutions when the normal operating temperature is less than 200°F.	The stainless steel components of the nonregenerative heat exchanger are exposed to oxygenated water at a 288°C (550°F) maximum temperature and 10 MPa maximum pressure. Even by NEI's criteria (comment E2-3 in this same table), SCC should be considered a legitimate aging mechanism. The GALL report was not revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
GVIIE3-11	E3.4.1 through E3.4.4	Remove references to "Cyclic Loading".	"Cyclic Loading" is not a mechanism. SCC can be postulated to result in crack growth without consideration of "Cyclic Loading". Inclusion of "Cyclic Loading" adds no value to this entry.	Stress corrosion cracking of the stainless steel components of the nonregenerative heat exchanger in the BWR reactor water cleanup system results in crack initiation and growth. The term "cyclic loading" was deleted from consideration as an aging mechanism. The GALL report was revised to address this comment.
GVIIE3-12	E3.4.4	A maximum temperature limit for the line item for MIC should be expressed. 200°F is an acceptable limitation.	For portions of the RWCU that regularly see temperatures in excess of 200°F, MIC is not an applicable aging mechanism.	Microbiologically influenced corrosion affecting non-regenerative heat exchanger (serviced by closed-cycle cooling water) shell and access cover is an aging mechanism of concern for portions of the RWCU with temperatures under 200°F. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIE4-1	E4.1.1	Under element 2 of Evaluation and Technical Basis, delete the last sentence regarding hydrogen water chemistry.	Both hydrogen water chemistry and noble metal addition are economic and business decisions made by each utility for their plants and should not be credited as a preventive action within GALL. This is a generic comment in various sections of the GALL for BWR's.	The AMP "Water Chemistry" (XI.M2, NUREG-1801, Vol. 2) with augmentation from the AMP "One-Time Inspection" (XI.32, NUREG-1801, Vol. 2) manages the aging of piping and fittings in the shutdown cooling system for older BWRs. As denoted in Element 2 "Preventive Actions" of the AMP "Water Chemistry" (XI.M2, NUREG-1802, Vol. 2), the use of hydrogen water chemistry and noble metal additions are not required for BWRs, but their use may allow reducing the extent of inservice inspection of stainless steel piping and BWR vessel internals. Hydrogen additions are effective in reducing electrochemical potentials in the recirculation piping system, but are less effective in the core region. Noble metal additions through a catalytic action increase the effectiveness of hydrogen additions in the core region. The GALL report was not revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIE4-2	E4.1.1	The Evaluation and Technical Basis elements 3, 5 and 10 have detailed information that is not necessary. Chapter V D2, item D2.1.1-D2.1-7 for similar materials and aging effect provides clear and succinct information for these elements and should be duplicated in this chapter and section. Specifics are as follows: Element 3, Parameters Monitored/Inspected: delete all and replace with element 3 information of Evaluation and Technical Basis of Chapter V.D2, item D2.1.1-D2.1.7. Element 5, Monitoring and Trending: delete the example after Section XI that states “e.g., 25% are examined every 10 y. at least 12% in 6 y.” Element 10, Operating Experience: delete all sentences after second sentence and replace with, “The AMP outlined in GL 88-01 has been effective in managing the effect of stress corrosion cracking in SS piping.”	These changes will make the GALL consistent for description of AMPs for similar materials and aging effects in different chapters of the GALL report.	Stainless steel piping and fittings in shutdown cooling systems in older BWRs exposed to oxygenated water are susceptible to stress corrosion cracking. Appropriate aging management programs include “BWR Stress Corrosion Cracking” (XI.M7, NUREG-1801, Vol. 2) and “Water Chemistry” (XI.M2, NUREG-1801, Vol. 2). The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIE4-3	E4.3.1	In the AMP column, (1) delete the "and" between BWRVIP 29 and TR-103515. Instead replace with "BWRVIP 29 (TR-103515). (2) Evaluation and Technical Basis: Element 2 delete "and TR-103515" and the last sentence about hydrogen water chemistry. (3) Element 3 delete the second sentence about details of ISI categories.	TR-103515 is BWRVIP 29. See rationale above and in comment 1. Makes it consistent with other GALL sections. See comment 2.	Stainless steel valve body and bonnets in shutdown cooling systems in older BWRs exposed to oxygenated water are susceptible to stress corrosion cracking. Appropriate aging management programs include "BWR Stress Corrosion Cracking" (XI.M7, NUREG-1801, Vol. 2) and "Water Chemistry" (XI.M2, NUREG-1801, Vol. 2). (1 and 2) The documents BWRVIP-29 and TR-103515 are the same document. When the document is used as a reference, it is referred to as BWRVIP-29. (3) As denoted in Element 4 "Detection of Aging Effects" of the AMP "Water Chemistry" (XI.M2, NUREG-1801, Vol.2), when used by itself, inspection of select components may be undertaken to verify the effectiveness of the chemistry control program and to ensure that significant degradation is not occurring and the component intended function will be maintained during the extended period of operation. The GALL report was revised to address this comment as stated above.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIF1-1	System Interface	Include a reference to Section VII I (Carbon Steel Components) for the external surfaces of piping.	The external surfaces of piping etc. should be included in Section VIII I, however this link is not clearly established.	See NRC disposition of NEI comment G-VII-1 in Appendix B, Table B.2.6.
G-VIIF1-2	System Interface	Include a reference to Section VII C2 (Closed Cycle Cooling Water System) as the cooling coils typically receive their cooling from this source.	The cooling coils typically receive their cooling from another system and this source is typically a Closed Cycle Cooling Water System.	Clarification has been provided in the System Interfaces section of the introductory page for the Control Room Area Ventilation System (Table F1) by adding the following sentence. “The cooling coils receive their cooling water from other systems such as the hot water system or the chilled water cooling system.” The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIF1-3	F1.4.2	Delete all references to Charcoal Adsorber Filter.	The Charcoal Adsorber Filter is not a 'passive long lived component.' Charcoal Adsorber is typically tested in accordance with Technical Specifications and Reg. Guide 1.52. Change out of Charcoal is expected during a 40-year plant life.	The charcoal absorber filter will be replaced during a 40-year plant life. The charcoal absorber filter is not a passive, long-lived component and will not be subject to an aging management review. The SRP was used to provide guidance and govern the consideration of this component. As stated in SRP Table 2.1-3, "Specific Staff Guidance for Screening," consumables that fall within category (d) for system filters, fire extinguishers, fire hoses, and air packs are typically replaced based on performance or condition monitoring that identifies whether these components are at the end of their qualified lives and may be excluded, on a plant-specific basis, from aging management review under 10 CFR 54.21(a)(1)(ii). The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIF1-4	F1.1.1, F1.1.2, F1.2.1, F1.4.1	Remove reference to MIC.	Microbiologically Influenced Corrosion is listed as an Aging Mechanism for the ducting, filters, and cooling coils. The fluid inside the duct is air with the potential for some moisture. Moisture does not subject the components to the aggressive environment normally associated with this type of corrosion. Therefore, this aging mechanism should not be considered. See NUREG-1705.	Microbiologically influenced corrosion (MIC) is not a viable aging mechanism for the duct, filters, and cooling coils that are not characterized by the usual aggressive environment normally associated with MIC. The GALL report was revised to address this comment by retaining MIC as an aging mechanism of concern for duct/drip-pan and piping for moisture drainage in the duct.
G-VIIF1-5	F1.2.1	Remove reference to General Corrosion.	This Aging Mechanism is listed for the Containment Air Handler Heating/Cooling Coils. The coils are annealed 90/10 copper nickel and is not susceptible to this type of corrosion. Therefore, this Aging Mechanism should not be considered.	The 90/10 copper/nickel containment air handler heating/cooling coils in the control room area ventilation system are exposed to warm, moist air and are susceptible to pitting and crevice corrosion. This alloy is not susceptible to general corrosion. The GALL report was revised to address this comment by deleting general corrosion as an aging mechanism.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIF1-6	F1.3.1	Remove reference to MIC.	Treated Closed Cycle Cooling Water is not susceptible to MIC.	Carbon steel components exposed to chemically treated closed-cycle cooling water (CCCW) are not susceptible to microbiologically influenced corrosion because treated CCCW is not amenable to biological growth. This aging mechanism was deleted for piping and fittings in the control room area ventilation system. The GALL report was revised to address this comment.
G-VIIF1-7	F1.1.3, F1.1.4	Remove "and Radiation" from Aging Mechanism entry.	Location of equipment would preclude radiation from contributing to aging during normal operations.	The Neoprene duct seals and collars in the control room area ventilation system are exposed to warm, moist air and are susceptible to heat-induced elastomer degradation. There is no radiation effect during normal operation. The GALL report was revised to address this comment by deleting the contribution of radiation to the aging mechanism.
G-VIIF2-1	System Interface	Include a reference to Section VII I (Carbon Steel Components) for the external surfaces of piping.	The external surfaces of piping etc. should be included in Section VIII I, however this link is not clearly established.	See NRC disposition of NEI comment G-VII-1 in this Appendix B, Table B.2.6.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIF2-2	System Interface	Include a reference to Section VII C2 (Closed Cycle Cooling Water System) as the cooling coils typically receive their cooling from this source.	The cooling coils typically receive their cooling from another system and this source is typically a Closed Cycle Cooling Water System.	Clarification has been provided in the System Interfaces section of the introductory page for the Auxiliary and Radwaste Area Ventilation System (Table F2) by adding the following sentence "The cooling coils receive their cooling water from other systems such as the hot water system or the chilled water cooling system." The GALL report was revised to address this comment.
G-VIIF2-3	F2.4.2	Delete all references to Charcoal Adsorber Filter.	The Charcoal Adsorber Filter is not a 'passive long lived component.' Charcoal Adsorber is typically tested in accordance with Reg. Guide 1.52. Change out of Charcoal is expected during a 40-year plant life.	See NRC disposition of NEI comment G-VIIF1-3 in this Appendix B, Table B.2.6.
G-VIIF2-4	F2.1.1, F2.1.2, F2.2.1, F2.4.1	Remove reference to MIC.	Microbiologically Influenced Corrosion is listed as an Aging Mechanism for the ducting, filters, and cooling coils. The fluid inside the duct is air with the potential for some moisture. Moisture does not subject the components to the aggressive environment normally associated with this type of corrosion. Therefore, this aging mechanism should not be considered. See NUREG-1705.	See NRC disposition of NEI comment G-VIIF1-4 in this Appendix B, Table B.2.6.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIF2-5	F2.2.1	Remove reference to General Corrosion.	This Aging Mechanism is listed for the Containment Air Handler Heating/Cooling Coils. The coils are annealed 90/10 copper nickel and is not susceptible to this type of corrosion. Therefore, this Aging Mechanism should not be considered.	See NRC disposition of NEI comment G-VIIF1-5 in this Appendix B, Table B.2.6.
G-VIIF2-6	F2.3.1	Remove reference to MIC.	Treated Closed Cycle Cooling Water is not susceptible to MIC.	See NRC disposition of NEI comment G-VIIF1-6 in this Appendix B, Table B.2.6.
G-VII F2-7	F2.1.3, F2.1.4	Remove "and Radiation" from Aging Mechanism entry.	Location of equipment would preclude radiation from contributing to aging during normal operations.	See NRC disposition of NEI comment G-VIIF1-7 in this Appendix B, Table B.2.6.
G-VII F3-1	System Interface	Include a reference to Section VII I (Carbon Steel Components) for the external surfaces of piping.	The external surfaces of piping etc. should be included in Section VIII I, however this link is not clearly established.	See NRC disposition of NEI comment G-VII-1 in this Appendix B, Table B.2.6.
G-VIIF3-2	System Interface	Include a reference to Section VII C2 (Closed Cycle Cooling Water System) as the cooling coils typically receive their cooling from this source.	The cooling coils typically receive their cooling from another system and this source is typically a Closed Cycle Cooling Water System.	Clarification has been provided in the System Interfaces section of the introductory page for the Primary Containment Heating and Ventilation System (Table F3) by adding the following sentence "The cooling coils receive their cooling water from other systems such as the hot water system or the chilled water cooling system." The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIF3-3	F3.4.2	Delete all references to Charcoal Adsorber Filter.	The Charcoal Adsorber Filter is not a 'passive long lived component.' Charcoal Adsorber is typically tested in accordance with Technical Specifications and Reg. Guide 1.52. Change out of Charcoal is expected during a 40-year plant life.	See NRC disposition of NEI comment G-VIIF1-3 in this Appendix B, Table B.2.6.
G-VIIF3-4	F3.1.1, F3.1.2, F3.2.1, F3.4.1	Remove reference to MIC.	Microbiologically Influenced Corrosion is listed as an Aging Mechanism for the ducting, filters, and cooling coils. The fluid inside the duct is air with the potential for some moisture. Moisture does not subject the components to the aggressive environment normally associated with this type of corrosion. Therefore, this aging mechanism should not be considered. See NUREG-1705	See NRC disposition of NEI comment G-VIIF1-4 in this Appendix B, Table B.2.6.
G-VIIF3-5	F3.2.1	Remove reference to General Corrosion.	This Aging Mechanism is listed for the Containment Air Handler Heating/Cooling Coils. The coils are annealed 90/10 copper nickel and is not susceptible to this type of corrosion. Therefore, this Aging Mechanism should not be considered.	See NRC disposition of NEI comment G-VIIF1-5 in this Appendix B, Table B.2.6.
G-VIIF3-6	F3.3.1	Remove reference to MIC.	Treated Closed Cycle Cooling Water is not susceptible to MIC.	See NRC disposition of NEI comment G-VIIF1-6 in this Appendix B, Table B.2.6.
G-VIIF4-1	System Interface	Include a reference to Section VII I (Carbon Steel Components) for the external surfaces of piping.	The external surfaces of piping etc. should be included in Section VIII I, however this link is not clearly established.	See NRC disposition of NEI comment G-VII-1 in this Appendix B, Table B.2.6.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIF4-2	System Interface	Include a reference to Section VII C2 (Closed Cycle Cooling Water System) as the cooling coils typically receive their cooling from this source.	The cooling coils typically receive their cooling from another system and this source is typically a Closed Cycle Cooling Water System.	Clarification has been provided in the System Interfaces section of the introductory page for the Diesel Generator Building Ventilation System (Table F4) by adding the following sentence, "The cooling coils receive their cooling water from other systems such as the hot water system or the chilled water cooling system." The GALL report was revised to address this comment.
G-VIIF4-3	F4.1.1, F4.1.2, F4.2.1	Remove reference to MIC.	Microbiologically Influenced Corrosion is listed as an Aging Mechanism for the ducting, filters, and cooling coils. The fluid inside the duct is air with the potential for some moisture. Moisture does not subject the components to the aggressive environment normally associated with this type of corrosion. Therefore, this aging mechanism should not be considered. See NUREG-1705.	See NRC disposition of NEI comment G-VIIF1-1 in this Appendix B, Table B.2.6.
G-VIIF4-4	F4.2.1	Remove reference to General Corrosion.	This Aging Mechanism is listed for the Containment Air Handler Heating/Cooling Coils. The coils are annealed 90/10 copper nickel and are not susceptible to this type of corrosion. Therefore, this Aging Mechanism should not be considered.	See NRC disposition of NEI comment G-VIIF1-5 in this Appendix B, Table B.2.6.
G-VIIF4-5	F4.3.1	Remove reference to MIC.	Treated Closed Cycle Cooling Water is not susceptible to MIC.	See NRC disposition of NEI comment G-VIIF1-6 in this Appendix B, Table B.2.6.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIF4-6	F4.1.3, F4.1.4	Remove "and Radiation" from Aging Mechanism entry.	Location of equipment would preclude radiation from contributing to aging during normal operations.	See NRC disposition of NEI comment G-VIIF1-7 in this Appendix B, Table B.2.6.
G-VIIG-1	VIIG	The fire protection program needs to be combined and placed in Chapter XI. Separate sections could be provided for fire barrier penetration seals; fire barrier walls, ceiling, and floors; and fire rated doors.	Place program in Chapter XI to be consistent with other programs.	The AMP "Fire Protection" (XI.M26, NUREG-1801, Vol. 2) includes fire barrier inspection program and diesel-driven fire pump inspection program. The fire barrier inspection program requires periodic visual inspection of fire barrier penetration seals, fire barrier walls, ceilings, and floors, and periodic visual inspection and function test of fire rated doors to ensure that operability is maintained. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIG-2	VIIG	Rather than focus on structures, which may change from site to site, this section should be rewritten to focus on components. Combine items G.1, G.2, G.3, G.4, and G.5 into three items: Fire Barriers, Fire Barrier Penetrations Seals, and Fire Rated Doors.	Editorial comment	The AMP "Fire Protection" (XI.M26, NUREG-1801, Vol. 2) includes fire barrier inspection program and diesel-driven fire pump inspection program. The fire barrier inspection program requires periodic visual inspection of fire barrier penetration seals, fire barrier walls, ceilings, and floors, and periodic visual inspection and function test of fire rated doors to ensure that operability is maintained. Aging mechanisms may be different in different structures. The GALL report is classified according to safety-related structures. Class I structures typically include all the structures and components identified in VIIG. The applicant always has the option of conducting an alternative plant-specific program. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIG-3	VIIG, Page VIIG-3	The structures in the first paragraph are not necessarily included within fire protection at all sites. The list of structures should be deleted.	Editorial comment	Representative structures (intake structures, turbine building, etc.) are provided in the Systems, Structures, and Components section of the introductory page for the Fire Protection section and are meant to be applicable to many plants although there may be other examples. The GALL report is not a scoping document. Class I structures typically include all the structures and components identified in VIIG. The applicant always has the option of conducting an alternative plant-specific program. The GALL report was not revised to address this comment.
G-VIIG-4	VIIG, G1.1 Page VIIG-5	Add the following as introduction for evaluation and technical basis: SECY-96-146 documents aging evaluations of fire barrier penetration seals, with details provided in an attached report. The report states that “many fire barrier materials are resistant to thermally accelerated aging and that the material properties of silicone-based material, which dominate the industry, are particularly age independent.” The document also reports they “did not find any penetration seal problems that were directly related to aging.” Therefore,	SECY-96-146 has drawn conclusions on aging of penetration seals. To ensure that these conclusions are captured and that no programs are required for aging management for penetration seals, the information should be included in this section.	Section 5.7 of SECY 96-146 concludes that existing licensee and vendor seal installation programs are adequate to prevent potential penetration seal installation problems. However, the staff never concluded that the existing penetration seal programs were adequate to address monitoring/preventive activities for aging penetration seals. For example, plant programs tend to focus on degradation caused by voids, holes, splits, and gaps in penetration seal materials. These are penetration seal operability issues. The intent of license renewal

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIG-4 (cont.)		no aging effects should be identified for penetration seals. However, if plant specific aging effects are identified which require aging management, the fire barrier inspection as presented below provides an acceptable method for managing aging. An applicant needs to ensure that its implementation of the fire barrier inspection is consistent with this evaluation.		is to manage the effects of aging prior to the loss of the intended function. Actions contained in preventive/monitoring programs would focus on shrinkage or other aging effects, which could lead to cracking or separation, which could eventually affect operability. Using the loss of the intended function as an indication to manage aging of penetration seals does not meet the intent of 10 CFR 54.21. In addition, the staff did not conclude in SECY-96-146 that abnormal shrinkage and aging could never occur in the future as plants operate beyond 40 years. Furthermore, NEI did not consider the influence of abnormal pipe movement caused by the cyclical heatup/cooldown period that occurs with refueling outages. These movements can cause penetration seals to move over time, which may lead to shrinkage, which causes cracking and separation. The GALL report was not revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIG-5	VIIG1.1, page VIIG-5	Change the following attributes under the program: **(2) Preventive Actions:** No preventive actions are specified. The program is a monitoring program. **(4) Detection of Aging Effects:** Visual inspection should detect cracking, separation from walls and component, rupture and puncture of seal. Visual inspection of a sample is performed at least once every 18 months. The frequency and extent of inspection ensures timely detection of the aging effects before loss of component intended function.	The attributes are changed to more correctly reflect the program. This statement matches how other preventive actions are addressed when it is a monitoring program. Clarified that a sample is inspected every 18 months.	The AMP "Fire Protection" (XI.M26, NUREG-1801, Vol. 2) includes a fire barrier inspection program and diesel-driven fire pump inspection program because the attributes were not clearly outlined. Elements (2) and (4) have been revised to match how other preventive actions are addressed and to clarify the detection of aging effects. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIG-6	VIIG1.2, page VIIG-5 and VIIG1.3, page VIIG-7	Change the following attribute: **(2) Preventive Actions**: No preventive actions are specified. It is a monitoring program.	This statement matches how other preventive actions are addressed when it is a monitoring program.	The fire barrier walls, ceilings, and floors and also the fire-rated doors in the intake structure are subject to aging resulting in loss of material. The AMP "Fire Protection" (XI.M26, NUREG-1801, Vol. 2) and the AMP "Structural Monitoring" (XI.S6, NUREG-1801, Vol. 2) manages the aging of the fire barrier walls, ceilings, and floors. The AMP "Fire Protection"(XI.M26, NUREG-1801, Vol. 2) manages the aging of the fire rated doors. In the Fire Protection AMP, element (2) was revised to include the following: "For operating plants, fire hazard analysis assess the fire potential and fire hazard in safety-related plant areas and specifies measures for fire prevention, fire detection, fire suppression, and fire containment and alternative shutdown capability for each fire area containing structures, systems, and components important to safety." The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VIIG-7	VIIG1.2, Page VIIG-5	Under parameters monitored, do not discuss the mechanisms.	The rule focuses on aging effects, not mechanisms.	Aging of the fire barrier walls, ceilings, and floors in the intake structure is managed by the AMP "Fire Protection" (XI.M26, NUREG-1801, Vol. 2) and the Structural Monitoring AMP (XI.S6). In Element (3) "Parameters Monitored/Inspected" of the AMP "Fire Protection" (XI.M26, NUREG-1801, Vol.2), visual inspection of the fire barrier walls, ceilings, and floors is said to examine the signs of degradation such as cracking, spalling, and loss of material caused by freeze-thaw, chemical attack, and reaction with aggregates. Visual inspection of penetration seals examines the signs of degradation such as cracking, seal separation from walls and component, separation of layers of material, rupture and puncture of seals which are directly caused by increased hardness and shrinkage of seal material due to weathering. The focus in this section is on aging effects (as produced by cited mechanisms). The GALL report was not revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII G-8	G.1.3, G.2.3, G.3.3, G.4.3, G.5.2	Delete entry for "Wear."	Element (10) of Evaluation and Technical Basis concludes, "Operating experience with this AMP has shown that degradation is insignificant." If degradation is insignificant, it cannot affect the intended function.	Absence of degradation during the first 40 years does not preclude problems during the period of extended operation. Furthermore, in Element 10 "Operating Experience," it is noted that fire doors have experienced wear of the hinges and handles. The GALL report was not revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII G-9	G.6.1, G.6.2	Delete entries for "Biofouling" for all components except sprinklers.	Component intended function is pressure boundary only. Biofouling does not prevent this intended function. This Aging Mechanism has the potential to cause blockage of deluge system spray nozzles. Other than that, it should not be considered applicable for fire protection system piping and components.	Biofouling affects both system flow performance and pressure boundary integrity. Flow performance is considered an active function covered under the current licensing basis and should not be included within the scope of license renewal. However, biofouling causes loss of material, which affects the pressure boundary and this passive function requires aging management. The GALL report was revised as follows to address this comment: 1. For all piping and components, all line items for buildup of deposits due to biofouling were deleted. 2. Loss of material due to biofouling was included as an aging effect for piping and pressure boundary components. 3. The aging management programs XI.M20 "Open-Cycle Cooling Water System," XI.M26 "Fire Protection," and XI.M27 "Fire Water System" were revised to remove reference to flow blockage and to clarify the aging effect to be managed is loss of material.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII G-10	G.7.1, G.7.2	Delete entries for Lubricating Oil environment.	(1) General Corrosion, Galvanic Corrosion, Crevice Corrosion, and Pitting are listed as Aging Mechanisms for the RCP Oil Collection Tank, Piping, Tubing, and Valves. These corrosion mechanisms are not plausible for these components since the internal environment is lube oil and air. (2) Lube oil acts to inhibit corrosion of carbon steel, and there is inadequate moisture in the system to promote corrosion. Therefore, General Corrosion, Crevice Corrosion, and Pitting should not be listed for the lube oil collection system components. This position was accepted in the CCNPP SER. (3) The element (10) Operating Experience entries under Evaluation and Technical Basis concur that no corrosion-related degradation has been observed for these components.	The collection tank and piping, tubing, and valve bodies in the reactor coolant pump oil collection system are subjected to a lubricating oil environment. (1 and 2) Corrosion is a plausible mechanism with lubricating oil and contaminant for the components (tank, piping, tubing, valve body) in the reactor coolant pump oil collection system. This has been addressed in the Oconee LRA (Vol. II, page 3.5-11 to 3.5-14: Table 3.5-9, Vol. II, page 3.5-135) and the ONS License Renewal SER (page 3-149 to 150). For clarification, “lubricating oil” in the environment column was replaced with “lubricating oil (with contaminants and/or moisture).” (3) A plant-specific AMP is suggested to determine the thickness of the components or tank. An acceptable verification program is provided in the AMP “One-Time Inspection” (XI.M32, NUREG-1801, Vol. 2). The GALL report was revised to address this comment as stated abaove.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII G-11	G.8.1	Remove reference to the Diesel Driven Fire Pump (Pump Casing).	The fire water pump has been mistakenly included with fuel oil components.	Both the fire water pump casing and the fuel oil line are in the scope of the program. The fire oil supply line should be kept with fire pump casing. BG&E LR states that the diesel fire pump is periodically tested to verify operability/availability through flow and discharge pressure tests. The pump is under observation during performance of the above tests and degradation of the fuel oil supply lines would be immediately evident. The GALL report was not revised to address this comment.
G-VII G-12	G.8.1	Delete entry for Fuel Oil environment.	(1) Loss of Material is listed as an applicable Aging Effect due to the Aging Mechanisms Crevice Corrosion, Pitting, Galvanic Corrosion, and General Corrosion for the Diesel Fire Pump Fuel Oil Supply Line. These corrosion mechanisms should only be considered plausible in fuel oil systems where there is a potential for water to pool or separate (tanks, receivers, stagnant piping, etc. (BAW-2270). The fuel oil supply line is not such a location, therefore, these mechanisms should not be considered. (2) This position was accepted in the Oconee SER. (3) The element (10) Operating Experience entries under Evaluation	(1) The carbon steel diesel-driven fire pump casing and fuel oil supply line in the diesel fire system are exposed to a fuel oil environment and are susceptible to general, galvanic, pitting, and crevice corrosion. The AMP “Fire Protection” and “Fuel Oil Chemistry” (XI.M26 and XI.M30, NUREG-1801, Vol. 2) manage aging. As stated in Element 3 of the AMP “Fire Protection” (XI.M26, NUREG-1801), the diesel-driven fire pump is under observation during the performance tests such as flow and discharge test, sequential starting capability test, and controller function test for detecting any degradation of the fuel supply line. Even if the position was accepted in the Oconee SER that

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII G-12 (cont.)			and Technical Basis concur that no corrosion-related degradation has been observed for these components.	corrosion would only be plausible in the fuel oil systems where there is a potential for water to pool or separate (tanks, receivers, stagnant piping), this does not imply that this position applies to all plants (varying in configuration and design). It does not necessarily preclude other plants from having to evaluate this. (2) GALL is a living and evolving document. A position accepted in the Oconee SER does not necessarily preclude other plants from having to evaluate this. (3) Absence of degradation during operation to date does not preclude problems during the period of extended operation. The GALL report was not revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII H1-1	H1.1.1, H1.4.2	(1) Delete the references in the References column Replace "For description of the AMP, see Chapter XI.S8 'Coating Program" with "Plant-specific aging management program" in the Aging Management Program column Replace "For evaluation and technical basis of the 10 elements of the AMP, see Chapter XI.S8 'Coatings Program' with "Plant-specific aging management program is to be evaluated."	The aging effect to be managed is loss of material of the carbon steel tank. The program described is management of the degradation of the coating. Degradation of the coating will not result in a loss of the component intended function of the tank. Different plants use a variety of activities or programs to monitor for loss of material of the carbon steel tank, not degradation of the coating. Due to this variety, the industry proposes that the aging management program be a plant-specific aging management program.	The condition of the coating does not directly affect the intended function. Coatings are covered under the Maintenance Rule. As shown in the columns for the recommended AMP and "Further Evaluation," a plant-specific AMP is to be evaluated and further evaluation is stipulated for aboveground piping and fittings. The GALL report was revised to address this comment by deleting coating degradation as an aging mechanism of concern for auxiliary systems.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII H1-2	H1.1.2	Delete the entries in the Reference, Aging Management Program, and Evaluation and Technical Basis columns and replace with the following: Leave the Reference column blank Insert "Plant-specific aging management program is to be evaluated" in the Aging Management Program column. Insert Plant-specific aging management program is to be evaluated" in the Evaluation and Technical Basis column.	The program described is not an industry standard practice at nuclear plants. Various activities are employed by different utilities that are not encompassed within the description of this program. The industry proposes that plant-specific aging management programs be evaluated for managing this aging effect.	The AMP "Buried Piping and Tanks Surveillance" (XI.M28, NUREG-1801, Vol. 2) manages the aging of buried carbon steel piping. Although the Buried Piping and Tanks Surveillance AMP (based on NACE standards) is not an existing nuclear industry standard practice, it is one acceptable method. An alternative to the AMP "Buried Piping and Tanks Surveillance" (XI.M28, NUREG-1801, Vol. 2), is the AMP "Buried Piping and Tanks Inspection" (XI.M34, NUREG-1801, Vol. 2) which inspects based on the frequency for the need to dig up piping considering plant operating experience that would allow for crediting the inspection when a pipe is dug up for any reason. The frequency and plant operating experience could be subject to a plant specific review. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII H1-3	H1.4.1	Should "ASTM D 270" be "ASTM D 4057."	This ASTM Standard was not in the 1996 through 2000 editions of the ASTM Standards. ASTM D 4057 has the same title. It may have replaced ASTM D 270.	The AMP "Fuel Oil Chemistry" (XI.M30, NUREG-1801, Vol. 2) manages the aging of carbon steel internal surfaces of the tank in the diesel fuel oil system. The reference ASTM D 270 was replaced by ASTM D 4057-95(2000), *Standard Practice for Manual Sampling of Petroleum and Petroleum Products*. The GALL report was revised to address this comment.
G-VII H1-4	H1.4.1	(1) Replace: "Exposure to fuel oil contaminants such as water and microbiological organisms is minimized by periodic cleaning/draining tanks and by verifying the quality of new oil before its introduction into the storage tanks." With: "Exposure to fuel oil contaminants such as water and microbiological organisms is minimized by verifying the quality of stored fuel oil and new fuel oil before its introduction." (2) Delete the following sentences from the Aging Management Program column: "However, corrosion may occur at locations where contaminants may accumulate, such as tank bottom, and verification of the effectiveness of the program should ensure that	Fuel oil chemistry alone is sufficient to manage aging the fuel oil storage tanks. Proper monitoring and maintenance of the fuel oil quality will preclude the accumulation of contaminants that could lead to corrosion.	The AMP "Fuel Oil Chemistry" (XI.M30, NUREG-1801, Vol. 2) manages the aging of carbon steel internal surfaces of the tank in the diesel fuel oil system. (1) The AMP program description states "Exposure to fuel oil contaminants, such as water and microbiological organisms, is minimized by periodic draining or cleaning of tanks...." Periodic cleaning and draining of tanks allows removal of sediments and periodic draining of water collected at the bottom of a tank which minimizes the amount of water and the length of contact time. (2) The AMP program description states that corrosion may occur at locations in which contaminants may accumulate, such as tank bottoms. Accordingly, there is a need for verification of the effectiveness of

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII H1-4 (cont.)		significant degradation is not occurring and the component intended function will be maintained during he extended period of operation. An acceptable verification program consists of a one-time thickness measurement of the tank bottom surface."		the program to ensure that significant degradation is not occurring and the component intended function would be maintained during the extended period of operation. Tank bottom thickness measurement is an acceptable method to verify the effectiveness of the AMP. The GALL report was not revised to address this comment.
G-VII H1-5	System Interface	Include a reference to Section VII I (Carbon Steel Components) for the external surfaces of carbon steel components in this section.	It is not clear that the external surfaces of carbon steel components are addressed in Section VII I of the GALL.	See NRC disposition of NEI comment G-VII-1 in this Appendix B, Table B.2.6.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII H1-6	H1.4.1	Delete entry for Biofouling.	Buildup of Deposit/Biofouling is listed as an Aging Effect/Mechanism for DFO Tank Internal Surfaces. The only passive intended function for the DFO Tank in the Diesel Fuel Oil System is the pressure boundary function. Buildup of Deposit/Biofouling does not affect the Tank's ability to accomplish this intended function, so this Effect/Mechanism should not be considered.	Biofouling affects both system flow performance and pressure boundary integrity. Flow performance is considered an active function covered under the current licensing basis and should not be included within the scope of license renewal. However, biofouling causes loss of material, which affects the pressure boundary and this passive function requires aging management. The GALL report was revised as follows to address this comment: 1. For all piping and components, all line items for buildup of deposits due to biofouling were deleted. 2. For all piping and components, loss of material due to biofouling was included as an aging mechanism for pressure boundary components. 3. The management program XI.M20 "Open-Cycle Cooling Water System" was revised to remove reference to flow blockage.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII H2-1	H2.1.1, H2.1.2	Delete ASME OM S/G Part 2 from the References column.	ASME OM S/G Part 2 provides performance and functional testing requirements that verifies the active functions of a system. The parameters monitored by this OM do not detect loss of material of the system components prior to a loss of the component function. Chemistry alone is sufficient in managing loss of material. This is demonstrated by the two industry events listed in the operating experience of the program description. One of those events was the loss of an active component function, not a passive function.	The AMP "Closed-Cycle Cooling Water" (XI.M21, NUREG-1801, Vol. 2) AMP relies on preventive measures to minimize corrosion by maintaining inhibitors and by performing surveillance testing and inspection based on the guidelines of EPRI-TR-107396 for closed-cycle cooling water (CCCW) systems. These measures will ensure that the CCCW systems and components serviced by the CCCW system are performing their function acceptably. The requirement for performance of functional tests per ASME OM S/G Part 2 was deleted in the AMP "Closed-Cycle Cooling Water" (XI.M21, NUREG-1801, Vol. 2). The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII H2-2	H2.1.1, H2.1.2	Delete the following in the Aging Management Program column: ", and performance and functional testing in accordance with ASME OM Standards and Guides, Part 2 to ensure that the CCCW system or components serviced by the CCCW system are performing their functions acceptably."	ASME OM S/G Part 2 provides performance and functional testing requirements that verifies the active functions of a system. The parameters monitored by this OM do not detect loss of material of the system components prior to a loss of the component function. Chemistry alone is sufficient in managing loss of material. This is demonstrated by the two industry events listed in the operating experience of the program description. One of those events was the loss of an active component function, not a passive function.	The AMP "Closed-Cycle Cooling Water" (XI.M21, NUREG-1801, Vol. 2) relies on preventive measures to minimize corrosion by maintaining inhibitors and by performing surveillance testing and inspection based on the guidelines of EPRI-TR-107396 for closed-cycle cooling water (CCCW) systems. These measures will ensure that the CCCW systems and components serviced by the CCCW system are performing their function acceptably. The requirement for performance of functional tests per ASME OM S/G Part 2 was deleted in the AMP "Closed-Cycle Cooling Water" (XI.M21, NUREG-1801, Vol.2). The GALL report was revised to address this comment.
G-VII H2-3	H2.1.1, H2.1.2	Need to add general corrosion, pitting corrosion, and crevice corrosion to the Aging Mechanism column for piping and fittings service by open cycle cooling water system.	These mechanisms will occur on carbon steel exposed to a raw water environment.	Carbon steel piping and fittings for the diesel generator cooling water subsystem in the emergency diesel generator system are susceptible to general, pitting, and crevice corrosion. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII H2-4	H2.1.1, H2.1.2	Delete "Jacket" from the Region of Interest column.	The jacket is a part of the diesel engine that is excluded from a license renewal aging management review.	The jacket (associated with the diesel engine cooling water subsystem) is part of the diesel engine that is excluded from a license renewal aging management review. The jacket (H2.1.2) was deleted from consideration. The GALL report was revised to address this comment.
G-VII H2-5	H2.1.1, H2.1.2	(1) Make the following change in the Aging Management Program column for carbon steel susceptible to erosion/corrosion: "However, the system is chemically treated with hydrazine to lower the dissolved oxygen level in order to minimize the corrosion effects. Lowering the oxygen content increases the susceptibility of the carbon steel piping to erosion/corrosion. This susceptibility depends on the flow rate, which is plant specific. Therefore a plant specific AMP is necessary." Should read as: "However, the system may be chemically treated with hydrazine to lower the dissolved oxygen level in order to minimize the corrosion effects. Lowering the oxygen content increases the susceptibility of the carbon steel piping to erosion/corrosion. This susceptibility depends on the parameters outlined in NSAC 202L-R2. If the system is	Just using hydrazine and lowering the oxygen content does not necessarily make erosion/corrosion a concern in this system. Other factors must be considered as outlined in NSAC 202L-R2.	The AMP "Open-Cycle Cooling Water System" (XI.M21, NUREG-1801, Vol. 2) manages the aging of the carbon steel piping and fittings for the diesel generator cooling water subsystem (serviced by open cycle cooling water system). The aging mechanism of erosion/corrosion has been deleted from consideration in the discussion of the emergency diesel generator system in GALL. The diesel engine cooling water subsystem jacket (H2.1.2) was deleted from consideration in Section H2 because it is part of the diesel engine that is excluded from a license renewal aging management review. The further evaluation column was changed to "No." The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII H2-5 (cont.)		susceptible to erosion/corrosion, the components should be added to the scope of Flow Accelerated Corrosion program." (2) Change: "Plant-specific aging management program is to be evaluated." to read "The scope of the Flow Accelerated Corrosion Program may need to be expanded to include these components if they are found to be susceptible to erosion/corrosion." (3) Change "Yes, plant specific" to "No" under the Further Evaluation column.		
G-VII H2-6	H2.1.1, H2.1.1	Vibration induced cracking is not a license renewal aging effect and should be deleted.	Vibration induced cracking is expected to occur during the current term and be corrected. This type of aging is random and is corrected as discovered with inspections of similar locations and configurations to ensure the event is location specific or a one-time event.	Vibration-induced cracking results in failure and subsequent replacement of affected devices. The rapid failure and swift correction implies this is not an aging issue. The aging mechanism of vibration-induced cracking was deleted from consideration in the discussion of the emergency diesel generator system in GALL. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII H2-7	H2.5.1	Should "ASTM D 270" be "ASTM D 4057."	This ASTM Standard was not in the 1996 through 2000 editions of the ASTM Standards. ASTM D 4057 has the same title. It may have replaced D 270.	The AMP "Fuel Oil Chemistry" (XI.M30, NUREG-1801, Vol. 2) manages the aging of carbon steel tanks in the diesel generator fuel oil subsystem. The reference ASTM D 270 was replaced by ASTM D 4057-95(2000), Standard Practice for Manual Sampling of Petroleum and Petroleum Products. The GALL report was revised to address this comment.
G-VII H2-8	H2.5.1	(1) Replace: "Exposure to fuel oil contaminants such as water and microbiological organisms is minimized by periodic cleaning/draining tanks and by verifying the quality of new oil before its introduction into the storage tanks." With: "Exposure to fuel oil contaminants such as water and microbiological organisms is minimized by verifying the quality of stored fuel oil and new fuel oil before its introduction." (2) Delete the following sentences from the Aging Management Program column: "However, corrosion may occur at locations where contaminants may accumulate, such as tank bottom, and verification of the effectiveness of the program should ensure that significant degradation is not	Fuel oil chemistry alone is sufficient to manage aging the fuel oil storage tanks. Proper monitoring and maintenance of the fuel oil quality will preclude the accumulation of contaminants that could lead to corrosion.	The AMP "Fuel Oil Chemistry" (XI.M30, NUREG-1801, Vol. 2) manages the aging of diesel fuel oil storage tanks. (1) The AMP "Program Description" states, "Exposure to fuel oil contaminants, such as water and microbiological organisms, is minimized by periodic draining or cleaning of tanks...." Periodic cleaning and draining of tanks allows removal of sediments and periodic draining of water collected at the bottom of a tank minimizes the amount of water and the length of contact time. (2) The AMP program description states that corrosion may occur at locations in which contaminants may accumulate, such as tank bottoms. Accordingly, there is a need for verification of the effectiveness of the program to ensure that

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII H2-8 (cont.)		occurring and the component intended function will be maintained during he extended period of operation. An acceptable verification program consists of a one-time thickness measurement of the tank bottom surface."		significant degradation is not occurring and the component intended function would be maintained during the extended period of operation. Tank bottom thickness measurement is an acceptable method to verify the effectiveness of the AMP. The GALL report was not revised to address this comment.
G-VII H2-9	System Interface	Include a reference to Section VII I (Carbon Steel Components) for the external surfaces of carbon steel components in this section.	It is not clear that the external surfaces of carbon steel components are addressed in Section VII I of the GALL.	See NRC disposition of NEI comment G-VII-1 in this Appendix B, Table B.2.6.
G-VII H2-10	H2.1.1, H2.1.2	Remove references to MIC.	Demineralized water in a closed cycle is not subject to MIC.	Carbon steel piping and fittings for the diesel engine cooling water subsystem (serviced by open-cycle cooling water system) exposed to chemically treated demineralized <90°C (194°F) water is susceptible to general, pitting and crevice corrosion. Microbiologically influenced corrosion (MIC) was deleted, as an aging mechanism because demineralized water in a closed-cycle is not amenable to MIC. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII H2-11	H2.1.1, H2.1.2	Delete entry for Biofouling.	The only passive intended function for the components in question is the pressure boundary function. Buildup of Deposit/Biofouling does not affect the components' ability to accomplish this intended function, so this Effect/Mechanism should not be considered.	Biofouling affects both system flow performance and pressure boundary integrity. Flow performance is considered an active function covered under the current licensing basis and should not be included within the scope of license renewal. However, biofouling causes loss of material, which affects the pressure boundary and this passive function requires aging management. The GALL report was revised as follows to address this comment: 1. For all piping and components other than heat exchangers, all line items for buildup of deposits due to biofouling were deleted. 2. For all piping and components, loss of material due to biofouling was included as an aging mechanism for pressure boundary components. 3. The aging management program XI.M20 "Open-Cycle Cooling Water System" was revised to remove reference to flow blockage.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII H2-12	H2.1.1, H2.1.2	Delete entry for Erosion/Corrosion.	There is no operating experience to justify inclusion of this mechanism. Also, Hydrazine is not typically used in Diesel cooling water systems.	The AMP "Open-Cycle Cooling Water System" (XI.M21, NUREG-1801, Vol. 2) manages the aging of the carbon steel piping and fittings for the diesel generator cooling water subsystem (serviced by open cycle cooling water system). The aging mechanism of erosion/corrosion has been deleted from consideration in the discussion of the emergency diesel generator system in GALL. The diesel engine cooling water subsystem jacket (H2.1.2) was deleted from consideration in Section H2 because it is part of the diesel engine that is excluded from a license renewal aging management review. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII H2-13	H2.1.1, H2.1.2	Delete entry for Vibration Induced Cracking.	There is no operating experience to justify inclusion of this mechanism. Why is this diesel subsystem susceptible to vibration but no others are? Excessive vibration is a design or maintenance issue, not an aging mechanism.	Vibration-induced cracking results in failure and subsequent replacement of affected devices. The rapid failure and swift correction implies this is not an aging issue. The aging mechanism of vibration-induced cracking was deleted from consideration in the discussion of the emergency diesel generator system in GALL. The diesel engine cooling water subsystem jacket (H2.1.2) was deleted from consideration in Section H2 because it is part of the diesel engine that is excluded from a license renewal aging management review. The GALL report was revised to address this comment.
G-VII H2-14	H2.5.1	“Dip” Tank should be “Drip” Tank.	There is no such thing as a “Dip” Tank.	The carbon steel day and drip tanks comprise part of the diesel generator fuel oil subsystem. The item was changed to drip tank to correct this typo. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII H2-15	H2.5.2	Delete entry for Fuel Oil environment.	Loss of Material is listed as an applicable Aging Effect due to the Aging Mechanisms Crevice Corrosion, Pitting, Galvanic Corrosion, and General Corrosion for the Diesel Fuel Oil Strainer. These corrosion mechanisms should only be considered plausible in fuel oil systems where there is a potential for water to pool or separate (tanks, receivers, stagnant piping, etc. (BAW-2270). The fuel oil strainer is not such a location, therefore, these mechanisms should not be considered. This position was accepted in the Oconee SER.	The fuel oil strainer is not in an environment where there is a potential for water to pool or separate. Corrosion as a mechanism should not be considered. The item was deleted. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII I-1	I.1.1	Revise Structure and Component "Carbon Steel Components (PWR's) to read "Carbon Steel Components and Closure Bolting (PWR's).	Bolting is not a component; as such it should not be called out separately in other sections in chapter VII. Chapter XI.M5, "Boric Acid Corrosion" applies. There is no need to distinguish bolting from other pressure boundary external surfaces relative to boric acid corrosion.	Bolting is an integral part of piping, fittings and miscellaneous related items, pumps, valves, and heat exchangers in the PWR containment spray system. Bolting is considered to be a system component for each individual engineered safety features system because it can be uniquely identified and also because it is a small component whose review could be missed if categorized under a broader category. GALL VII-I on CS Components includes AMPs for degradation of all CS structures and components, including closure bolting. In addition, ASME Section XI treats individual bolting as a component and requires inspection of individual bolting. The GALL report was not revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII I-2	I.1.1	Delete reference to ASME section XI in program description for BAC.	Implementation of the Boric Acid Corrosion Program at the sites has nothing to do with ASME Section XI. This program is performed independent of Section XI for the identification of boric acid corrosion. Most utilities perform this inspection at the start of the outage to identify problems so that they may be repaired while off-line. Leakage identified during the performance of pressure tests and hydrostatic tests are handled per the ASME Code requirements.	NRC GL 88-05 provides a stand-alone program for inspection of carbon steel structures and components for evidence of boric acid leakage and corrosion. Inservice inspection that detects leakage identified during the performance of pressure tests and hydrostatic tests are required by the ASME Code and are performed independent of the AMP “Boric Acid Corrosion” (XI.M10, NUREG-1801, Vol. 2) and were removed. The GALL report was revised to address this comment.
G-VII I-3	I.1.1	Atmospheric corrosion is only applicable to carbon steel components associated with portions of systems operating below 212°F.	Since moisture is necessary for general, pitting and any other forms of atmospheric corrosion, the external surfaces of carbon steel components, which operate above 212°F, are not susceptible to loss of material due to corrosion.	Several CS components in the Auxiliary Systems are exposed to temperatures lower than 212°F, and are therefore susceptible to general corrosion. Because atmospheric corrosion is not applicable to this environment, the term has been deleted and replaced with general corrosion, which is applicable to this environment. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII I-4	I.1.1	Delete reference to XI.S8, "Coating Program" under Aging Management Program Column for atmospheric corrosion. Plant specific review should be performed.	The use of coatings is a preventive measure to minimize or preclude the loss of material due to corrosion. Loss or degradation of coatings does not result in loss of material, and thus is not considered an aging effect. Programs credited for monitoring loss of material typically constitute periodic visual inspections of component external surfaces for signs of corrosion or loss of material. Since programs credited vary between plant sites, a plant specific review should be performed.	The external surfaces of BWR and PWR CS components are subjected to air, moisture, and humidity resulting in loss of material caused by general corrosion. (The term "atmospheric corrosion" was replaced with "general corrosion.") A plant-specific aging management program needs to be evaluated for these conditions. Reference to the AMP "Protective Coating Monitoring and Maintenance Program" (XI.S8, NUREG-1801, Vol. 2) was deleted. Because the condition of the coating does not directly affect the intended function, coating degradation was deleted as an aging mechanism of concern for auxiliary systems. As shown in the columns for the recommended AMP and "Further Evaluation," a plant-specific AMP is to be evaluated and further evaluation is stipulated. The GALL report was revised to address this comment.

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII I-5	I.2.1	(1) Delete "Air, Moisture, Humidity and Leaking Fluid" under Environment Column for Closure Bolting. Replace with "Air, Leaking Chemically treated Borated Water." (2) Delete "Atmospheric Corrosion" under Aging Mechanism column and replace with "Boric Acid Corrosion." (3) Replace information in References column, Aging Management Program column and Evaluation and Technical Basis column with that provided in I.1.1 for Boric Acid Corrosion.	Most carbon or low alloy steel bolting is in a dry environment and coated with a lubricant, thus general corrosion of bolting has not been a major concern in the industry. Corrosion of fasteners has only been a concern where leakage of a joint occurs, specifically, when exposed to aggressive chemical attack such as that resulting from borated water leaks. Aging effect requiring management should be loss of mechanical closure integrity due to aggressive chemical attack (boric acid corrosion).	(1)Closure bolting in high-pressure or high-temperature BWR or PWR systems can be said to be exposed to "Air, Moisture, Humidity and Leaking Fluid" for both systems. The general term "leaking fluid" was used to also encompass the borated water found in PWRs. (2) Because atmospheric corrosion is not applicable to this environment, the term has been deleted and replaced with general corrosion, which is applicable to this environment. (3) Closure bolting in the above-mentioned environment in high-pressure or high-temperature BWR or PWR systems is susceptible to general corrosion resulting in loss of material. The AMP "Bolting Integrity" (XI.M18, NUREG-1801, Vol. 2) which covers all bolting within the scope of license renewal manages the aging process. The GALL report was revised to address this comment only for part (2).

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII I-6	I.2.1	Delete Aging Effect/Mechanism "Loss of Pre-load due to Stress Relaxation." (Note: Reference column and AMP Column incorrect list Item H.2.1 instead of I.2.1.)	Loss of pre-load of mechanical closures can occur due to settling of mating surfaces, relaxation after cyclic loading, gasket creep, and loss of gasket compression due to differential thermal expansion. These effects are the same as that of a degraded gasket; that is, the potential for leakage of internal fluid at the mechanical joint. Since the ASME code does not consider gaskets, packing, seals, and O-rings to perform a pressure retaining function, these components are typically not considered to support an intended function and not within the scope of license renewal. Thus, with the exception of Class 1 components and those cases where a gasket or seal is utilized to provide a radiological barrier, the aging mechanisms associated with loss of pre-load, described above are not considered to require management. Class 1 components credit the ISI Inspection Program to address loss of pre-load due to stress relaxation.	Loss of preload would result in leakage and would be managed as part of the bolted component. The GALL report was revised to address this comment by deleting loss of preload as an aging effect. (Errors in the Reference and AMP columns were corrected in NUREG-1801, Vol. 2.)

Table B.2.6: Disposition of NEI Comments on Chapter VII of GALL Report (continued)

Comment Number	Item Number	Comment/Proposed Change	Basis for Comment	NRC Disposition
G-VII I-7	I.2.1	Delete Aging Effect/Mechanism "Crack Initiation/Growth" due to Cyclic loading, Stress Corrosion Cracking. (Note: Reference column and AMP Column incorrect list Item H.2.1 instead of I.2.1.)	Although there have been a few instances of cracking of bolting in the industry due to SCC, these have been attributed to high yield stress materials and contaminants, such as the use of lubricants containing MoS_2. For quenched and tempered low alloy steels (e.g., SA193 Grade B7) used for closure bolting material, susceptibility to SCC is controlled by yield strength. Additionally, operating experience and existing data indicate that SCC failure should not be a significant issue for the bolting materials of SA193 Grade B7.	Closure bolting in high-pressure or high-temperature BWR or PWR systems exposed to air, moisture, humidity and leaking fluid can be susceptible to the aging mechanisms of cyclic loading and stress corrosion cracking. Field experience shows that SCC (NRC GL 91-17) caused 20% of the bolt failures. The bolts made of SA 193 Grade B7 can have YS as high as 175 ksi and failures have been reported with YS as low as 150 ksi. In Section II of the ASME Code, the specification for SA193 Grade B7 for bolting only give a minimum YS of 105, but no maximum is given. Crack initiation and growth can result in leakage. 20% of the bolting failure is due to SCC. The GALL report was not revised to address this comment.

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