ENERGY NORTHWEST

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July 16, 2010
GO2-10-094

10 CFR 54.17
10 CFR 54.21

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397 LICENSE RENEWAL APPLICATION FIRST ANNUAL UPDATE**

Reference: Letter, G02-10-11, dated January 19, 2010, WS Oxenford (Energy Northwest) to NRC, "License Renewal Application"

Dear Sir or Madam:

In the reference, Energy Northwest requested the renewal of the operating license for Columbia Generating Station (Columbia). The License Renewal Rule, 10 CFR 54.21(b), requires that each year following submittal of a license renewal application (LRA), and at least 3 months before scheduled completion of the NRC review, an amendment to the renewal application must be submitted that identifies any change to the current licensing basis (CLB) of the facility that materially affects the content of the LRA.

In accordance with this requirement, Energy Northwest performed a review of CLB changes after the LRA reference freeze date that formed the basis for the submittal of LRA until January 2010 to determine if any sections of the LRA were affected by these changes. This update also includes a review of plant specific operating experience for the same time frame. As another element of the review, Energy Northwest personnel walked down areas of Columbia to validate scoping and screening decisions reached early in the License Renewal Project. During the walkdown, the Energy Northwest License Renewal team identified systems and components that should have been included in the original scope for license renewal. The issues identified during the walkdown were entered into the corrective action program.

A035
NRR

As a result, Energy Northwest has determined that several changes to the LRA are required. A number of these changes are related to a new material and environment combination of stainless steel exposed to soil was identified and the Buried Piping and Tanks Inspection Program (XI.M34) has been revised to manage the aging effects. However, no new aging effects have been identified and no new aging management programs are required. Energy Northwest has determined that the LRA, as amended, continues to provide the appropriate administrative, technical, and environmental information sufficient to support the findings required by 10 CFR 54.29. Actions have been identified to manage the effects of aging on the structures and components subject to aging management review, such that the intended functions will be maintained consistent with the current licensing basis during the Columbia period of extended operation (PEO).

Enclosure 1 contains Amendment 1 to the LRA. As discussed with the NRC License Renewal Project Manager, Ms. Evelyn Gettys, Energy Northwest is providing marked-up pages and new pages to add to the LRA, rather than clean pages with the changes incorporated into the text.

As was provided in the original application, the revised Boundary Drawings are provided in Enclosure 2 as information only to aid the reviewers and are not part of the LRA submittal.

Some of the changes to the scoping, aging management review results, or an aging management program have resulted in changed pages in several LRA sections. To facilitate the review, the change summaries, categorized by change type and numbered, are followed by the LRA Amendment 1 pages (an additional copy of the same pages provided in Enclosure 1). No changes were required because of facility changes. The summaries are divided into 4 groups.

Editorial (E) changes are in Attachment 1.
Operating (O) experience update changes are in Attachment 2.
Reference (R) update review changes are in Attachment 3.
Walkdown (W) result changes are in Attachment 4.

There are no new regulatory commitments contained in the LRA Amendment.

Should you have any questions concerning this submittal, please contact Abbas Mostala, License Renewal Project Manager, at 509-377-4197.

In accordance with 10 CFR 50.91, a copy of this application, with attachments, is being provided to the designated Washington State Official.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the date of this letter.

Respectfully,

SK Gambhir
Vice President, Technical Services

Enclosures:

1. License Renewal Application, Amendment 1
2. For information only – Revised boundary drawings (3 copies)

Attachments:

1. Summary of Editorial changes
2. Summary of Operating experience update changes
3. Summary of Reference update review changes
4. Summary of Walkdown result changes

cc: NRC Region IV Administrator
EJ Leeds – NRC NRR
BE Holian - NRC NRR
EH Gettys - NRC NRR (5 copies)
NRC NRR Project Manager
NRC Senior Resident Inspector/988C
RN Sherman – BPA/1399
WA Horin – Winston & Strawn
EFSEC Manager
RR Cowley - WDOH

Summary of Editorial changes		
Change Number	**Summary**	**Changed or new pages**
1	Corrected plural "criteria" to "criterion"	2.5-3
2	Noted that ISG-02, "Staff Guidance on Scoping of Equipment Relied on to Meet the Requirements of the Station Blackout (SBO) Rule (10 CFR 50.63) for License Renewal," is historical because the document was incorporated into NUREG 1801, Revision 1.	2.5-8
3	Corrected "going" to "ongoing" in the commitment related to Masonry Wall Inspection.	A-56
4	Revised description of the Operating Experience section of the Flow-Accelerated Corrosion (FAC) Program to delete the subjective words "recently" and "current."	B-120
5	Revised description of the Operating Experience section of the Structures Monitoring Program to delete the subjective word "recent." Corrected "documents" to "documented."	B-196
49	Added the acronym (DOT) following the first use of Department of Transportation. Acronym was used in following sentences without prior definition	2.3-96

E1

2.5.3 Elimination of Component Commodity Groups with no License Renewal Intended Functions

No generic electrical and I&C component commodity groups were eliminated from AMR at Columbia, in accordance with the direction of 10 CFR 54.21(a)(1)(i) regarding license renewal intended functions. However, individual components within a component and commodity group may still be eliminated from AMR based on this ~~criteria~~. Replace: "criterion"

2.5.4 Application of Screening Criteria 10 CFR 54.21(a)(1)(ii) to Electrical and I&C Component Commodity Groups

The next step in the electrical screening process is to segregate the "long-lived" electrical components from those that are subject to replacement based on a qualified life or a specified time schedule. In general, components that are screened out of license renewal consideration based on the "long-lived" criterion are those included in the plant environmental qualification (EQ) program. Electrical components included in the plant EQ program have qualified lives and are replaced based on their qualified life determination. Therefore, environmentally qualified components do not meet the "long-lived" criterion of 10 CFR 54.21(a)(1)(ii) and are excluded from further evaluation. EQ evaluations that meet the criteria for a time-limited aging analysis are addressed in Section 4.4.

2.5.4.1 Electrical Portions of Electrical and I&C Penetration Assemblies

The electrical penetration assembly commodity group is excluded from AMR because all of the Columbia electrical penetrations are part of the EQ program. The electrical penetration assemblies are addressed by various EQ analyses. Therefore, the electrical penetration assemblies are not subject to AMR at Columbia, because they do not meet the long-lived criterion of 10 CFR 54.21(a)(1)(ii).

2.5.4.2 Insulated Cables and Connections in the EQ Program

The insulated cables and connections that are included in the plant EQ program have qualified lives and are replaced based on their qualified life determination. Therefore, insulated cables and connections that are included in the EQ program do not meet the "long-lived" criterion of 10 CFR 54.21(a)(1)(ii) and are not subject to AMR.

2.5.5 Electrical and I&C Component Commodity Groups Requiring an Aging Management Review

The electrical and I&C component commodity groups that require AMR are listed in Table 2.5-1, along with their intended functions. Intended functions are defined in Table 2.0-1.

Table 3.6.2-1, Aging Management Review Results - Electrical and I&C Components, provides the results of the AMR.

E2

The function of high-voltage insulators is to insulate and support an electrical conductor. High voltage insulators are passive, long-lived components. Therefore, high voltage insulators meet the criteria of 10 CFR 54.21(a)(1) and are subject to an AMR.

2.5.6 Evaluation Boundaries

2.5.6.1 System Evaluation Boundaries

The evaluation boundaries for the electrical and I&C systems within the scope of license renewal include the entire system. Electrical and I&C component types within the boundaries of in-scope mechanical systems are also included within the electrical and I&C evaluation boundaries.

2.5.6.2 Station Blackout Evaluation Boundaries

The License Renewal Rule, 10 CFR 54.4(a)(3), requires that plant SSCs relied on for compliance with the NRC regulation on station blackout (SBO), 10 CFR 50.63, be included in the scope of license renewal. In April 2002, the NRC issued additional guidance on the (license renewal) scoping of equipment relied on to meet the requirements of 10 CFR 50.63 in the form of an Interim Staff Guidance document (ISG-02). Subsequently, this guidance was incorporated into NUREG-1801, Revision 1.

Insert: ", which is now an historical reference"

Using the requirements of the License Renewal Rule, the guidance provided in NUREG-1800, the insights of ISG-02, and the current licensing basis documentation, the SBO license renewal scoping boundary was established and the in-scope SSCs for SBO were identified. The following paragraphs describe the SBO license renewal off-site power recovery paths for Columbia.

Two independent offsite power sources are supplied to Columbia via start-up transformer E-TR-S and back-up transformer E-TR-B.

The 230-kV grid is connected to the onsite power system by breaker E-CB-TRS (also known as A809) at the Ashe substation then via overhead line to transformer E-TR-S located in the Columbia transformer yard. The distribution from the start-up transformer (E-TR-S) to the Class 1E buses is through the non-segregated bus to switchgear SM-1 and SM-3. Each of these NSR switchgear feed to the Class 1E switchgear for Division 1 and Division 2 (SM-7 and SM-8, respectively).

The 115-kV grid is connected to the onsite power source by oil circuit breaker E-CB-TRB located in the Columbia transformer yard. The output of breaker E-CB-TRB is directly tied by switchyard bus to back-up transformer E-TR-B, which is then directly connected by cable (routed underground and then in tray) to the Class 1E switchgear for Division 1 and Division 2 (SM-7 and SM-8 respectively).

Amendment 1

E3

Table A-1
Columbia License Renewal Commitments

Item Number	Commitment	FSAR Supplement Location (LRA App. A)	Enhancement or Implementation Schedule
38) Masonry Wall Inspection	The Masonry Wall Inspection is an existing program that will be continued for the period of extended operation, with the following enhancements: • Specify that for each masonry wall, the extent of observed masonry cracking or degradation of steel edge supports and bracing are evaluated to ensure that the current evaluation basis is still valid. Corrective action is required if the extent of masonry cracking or steel degradation is sufficient to invalidate the evaluation basis. An option is to develop a new evaluation basis that accounts for the degraded condition of the wall (i.e., acceptance by further evaluation).	A.1.2.38	Enhancement prior to the period of extended operation. Then ~~going~~ ongoing.
39) Material Handling System Inspection Program	The Material Handling System Inspection Program is an existing program that will be continued for the period of extended operation~~,~~ ~~with the following enhancement:~~ ~~• Ensure jib cranes and electrically operated hoists are visually inspected for corrosion~~.	A.1.2.39	~~Enhancement prior to the period of extended operation~~. ~~Then~~ ongoing.

Amendment 1

E4

periodically reported, including material conditions. Industry operating experience has been, and continues to be, evaluated for impact to Columbia and for possible program enhancement. For example, based on review of INPO operating experience 14865, the program was enhanced to require evaluation of replacements for future inspection.

Periodic self assessments are also conducted. Gaps identified during the most recent self assessment have all been closed; and the FAC program plan was ~~recently~~ updated, with the ~~current~~ revision addressing all issues identified by the self assessment. In the last benchmark assessment, performed in March 2007, no issues or weaknesses were identified.

As a result, Columbia has programs and procedures in place, with operating experience demonstrating that the FAC Program is capable of detecting and managing loss of material due to FAC for susceptible components, and will continue to be an effective aging management program for the period of extended operation.

A review of program health reports, recent self-assessment reports, and related condition reports, demonstrates that the FAC Program is effective in detecting loss of material due to FAC for susceptible components, and defining the corrective actions (e.g., repair or replacement) necessary to assure their continued operation in accordance with design requirements.

Conclusion

The FAC Program will detect and manage loss of material due to FAC for susceptible components. The FAC Program, with the required enhancements, provides reasonable assurance that the aging effects will be managed such that components subject to aging management review will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

E5

of whether failures were maintenance preventable. A review of the Maintenance Rule program periodic assessments did not identify any age-related functional failures related to structures. Two non-age related functional failures identified were that the Reactor Building crane was parked without the tornado latches installed and a 10 CFR 21 notice from Whiting Crane Corporation regarding a weld defect on the Reactor Building crane main trolley.

Replace with "documented"

A ~~recent~~ condition report ~~documents~~ a surface flaw noted in the concrete of the west exterior wall of the Reactor Building. The surface flaw appears to have existed for a significant period of time with no apparent adverse effects on secondary containment or the Reactor Building structure. Add Insert A on page B-196a

NRC Unresolved Item (URI) 05000397/2007005-02 was issued in February of 2008. This URI identified that Columbia had not performed nor scheduled condition monitoring, inspection, or preventative maintenance (since receiving an operating license in 1983) of the submerged portion of the suppression chamber, the standby service water spray ponds, or the condensate storage tanks. The URI stated that although the licensee performed some monitoring of these structures, failure to perform monitoring of the submerged portion of these structures could result in undetected cracks or leakage that could prevent them from meeting their design basis functions. This URI was documented in a condition report ~~that is currently being~~ resolved under the corrective action process with closure information ~~expected near the time of the LRA submittal~~. Replace with "reviewed and accepted by the NRC" Replace with "and has been"

The Structures Monitoring Program provides reasonable assurance that aging effects are being managed. This has been demonstrated through inspection reports, program health reports, periodic assessments, and the corrective action program.

The site corrective action program and ongoing review of industry operating experience will be used to ensure that the program continues to be effective in managing the identified aging effects.

Conclusion

The Structures Monitoring Program, with enhancements, will be capable of detecting and managing aging effects for structures within the scope of license renewal. The continued implementation of the Structures Monitoring Program, with the required enhancements, provides reasonable assurance that the effects of aging will be managed so that components subject to aging management review will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

Summary of Operating Experience Update Changes		
Change Number	**Summary**	**Changed or new pages**
16	Based on a review of recent operating experiences, the environment of the air handling units WMA-AH-51 A/B was updated to include internal condensation. A plant specific note was added to clarify.	3.3-315 3.3-328 3.3-328a 3.3-4003.3-400a B-68 B-68a
17	Updated the Appendix J Program to include the system health report information for an additional (2009) year. The new information did not change the conclusions reached about the program.	B-35
18	Updated the Fuel Oil Chemistry Program to reflect the completion of the evaluation for possible adverse impacts due to use of ultra-low-sulfur diesel (ULSD). Energy Northwest has determined that there are no compatibility issues and that no corrective actions or modifications are required to complete the transition to ULSD.	B-123
19	Included information about the August 2009 failure of a 6.9 kV metal-enclosed bus (MEB) to the Operating Experience section of the Metal-Enclosed Bus Program. Although the MEB is not in scope, the failure was attributed to an aging effect and is applicable to the program discussion.	B-158
20	Updated the Operating Experience section of the Structures Monitoring Program. One item provided additional information regarding the flaw in exterior wall of the reactor building. The results of the visual examination were included. Corrective actions include re-inspection and trending by the Program. A second change was made to reflect the closure of the Unresolved Item (URI) regarding the failure to perform monitoring on submerged portions of some structures. The NRC has closed the URI in NRC Integrated Inspection Report 05000397/20090004.	B-196 B-196a B-207

Summary of Operating Experience Update Changes		
Change Number	**Summary**	**Changed or new pages**
47	Updated the Material Handling System Inspection Program to include the system health report information for an additional (2009) year. The new information did not change the conclusions reached about the program.	B-154

O 16-1

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of NUREG-1801

Item Number	Component/Commodity	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-94	Stainless steel and nickel alloy piping, piping components, and piping elements exposed to air – indoor uncontrolled (external)	None	None	NA - No AEM or AMP	Consistent with NUREG-1801. No aging effects requiring management are identified for stainless steel piping, piping components, and piping elements in the auxiliary systems that are exposed to air-indoor uncontrolled (external). This item is also applied to stainless steel accumulators, bolting, drain pans, duct, Insert: "heat exchanger components," screens, and tanks that are exposed to air-indoor uncontrolled (external). A Note C is applied.
3.3.1-95	Steel and aluminum piping, piping components, and piping elements exposed to air – indoor controlled (external)	None	None	NA - No AEM or AMP	Not applicable. There are no steel or aluminum piping, piping components, or piping elements in the auxiliary systems that are exposed to air-indoor controlled (external). All air-indoor environments were conservatively evaluated as uncontrolled environments.

O 16-2

Table 3.3.2-36 Aging Management Review Results – Radwaste Building HVAC Systems

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
92	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
93	Valve Body	Structural integrity	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.I-11	3.3.1-58	A

Insert new rows 94 through 99 for Table 3.3.2-36 as shown on page 3.3-328a

O 16-2

Table 3.3.2-36 Aging Management Review Results – Radwaste Building HVAC Systems

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
94	Air-Handling Unit Housing (WMA-AH-51A/B)	Pressure boundary	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	C0302
95	Air-Handling Unit Housing (WMA-AH-51A/B)	Pressure boundary	Steel	Condensation (Internal)	Loss of material	Cooling Units Inspection	VII.G-23	3.3.1-71	E0326
96	Air-Handling Unit Housing (WMA-AH-51A/B)	Pressure boundary	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
97	Bolting	Pressure boundary	Steel	Soil (External)	Cracking	Buried Piping and Tanks Inspection	N/A	N/A	G
98	Bolting	Pressure boundary	Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	N/A	N/A	G
99	Bolting	Pressure boundary	Steel	Soil (External)	Loss of pre-load	Buried Piping and Tanks Inspection	N/A	N/A	G

O 16-3

Plant-Specific Notes:	
0315	The BWR Water Chemistry Program and Chemistry Program Effectiveness Inspection will manage loss of material of components submerged in the suppression pool and subject to a treated water environment.
0316	The fire protection diesel engine coolant (antifreeze) is evaluated as Raw Water.
0317	The Fire Water Program also manages loss of material due to selective leaching of fire sprinker system spray nozzles that are normally exposed to a raw water (internal) environment. The copper alloy spray nozzles are inspected or replaced in accordance with the Fire Water Program; the inspection includes detection of selective leaching.
0318	For conservatism, it is assumed that ammonia or ammonium compounds are present in the raw water environment as a by-product of organic decay, as a by-product of MIC, or possibly from fertilizers.
0319	Subject component is exposed to reactor closed cooling (RCC) water.
0320	Subject component has an air-water interface that constitutes an agressive environment.
0321	Subject component is exposed to plant service water (TSW).
0322	Environment is predominantly outdoor air with infrequent, and for short duration, exposure to diesel exhaust.
0323	The internal environment between the outer and inner vessels of CN-TK-1 is conservatively evaluated as air instead of as a vacuum. Since the external surface is exposed to the more aggressive outdoor air environment, aging effects will occur on the external surface before they occur on the internal surface.
0324	The aging effect determination for the Air-outdoor (Internal) environment is the same as the NUREG-1801 determination for an Air-outdoor (External) environment because the material is the same and the internal environment is equivalent to the external environment evaluated in the NUREG-1801 item. Monitoring of the external surface condition will be used to characterize the aging effects on the internal surfaces.

Insert A shown on page 3.3-400a

Insert A to LRA Page 3.3-400

0325	The material is not aluminum alloy > 12% Zinc or 6% Magnesium, which is required for the mechanism of cracking due to stress corrosion cracking to be applicable.
0326	Based on a review of recent operating experience, the bottom portion of the air-handling unit housings for WMA-AH-51A/B are evaluated as exposed to an internal environment of condensation.
0327	No aging effects requiring management have been identified. However, for all brass (copper alloy > 15% Zn) spray nozzles that are in the scope of license renewal, the Fire Water Program is credited to provide confirmation of the absence of significant aging effects during the period of extended operation.

O 16-4

experience (e.g., time in-service, most susceptible locations, lowest design margins). Inspection findings that do not meet the acceptance criteria will be evaluated using the Columbia corrective action process to determine the need for subsequent aging management activities and for monitoring and trending of the results.

- Acceptance Criteria
  Indications or relevant conditions of degradation detected during the inspections will be compared to pre-determined acceptance criteria. If the acceptance criteria are not met, then the indications and conditions will be evaluated under the corrective action program to determine whether they could result in a loss of component intended function during the period of extended operation.

- Corrective Actions
  This element is common to Columbia programs and activities that are credited with aging management during the period of extended operation and is discussed in Section B.1.3.

- Confirmation Process
  This element is common to Columbia programs and activities that are credited with aging management during the period of extended operation and is discussed in Section B.1.3.

- Administrative Controls
  This element is common to Columbia programs and activities that are credited with aging management during the period of extended operation and is discussed in Section B.1.3.

- Operating Experience
  The Cooling Units Inspection is a new one-time inspection activity for which plant operating experience has not shown the occurrence of the aforementioned aging effects. The inspection provides for confirmation of material conditions near the period of extended operation. The elements comprising the inspection activity are to be consistent with industry practice.

  NUREG-1801 is based on industry operating experience through January 2005. Recent industry operating experience has been reviewed for applicability; none was identified. Future operating experience is captured through the normal operating experience review process, which will continue through the period of extended operation.

  A review of Columbia operating experience, documented in recent work orders, revealed that cooling unit coils have been found clean and no leakage was observed.

Add Insert A from Page B-68a

Amendment 1

O 16-4

Insert A to LRA Section B.2.14, page B-68

In addition, water was found to be dripping from duct downstream of Control Room Division 1 air handling unit WMA-AH-51A in June of 2009. This was determined to be from condensation that collected in a depression in the bottom of the air handling unit housing. Water was removed from the bottom of the housing and similar air handling units were inspected and confirmed to be self-draining properly. No corrosion of the air unit housing was identified during the removal and inspection.

Type B and C leakage rate test results from the 2007 Refueling Outage (R18) are summarized in the local leak rate test post outage report. The R18 local leak rate test involved ninety-one Type B and C air tests. Twenty-five Type B tests were conducted, including the personnel airlock barrel test. All Type B as found leak rates were below their administrative limits with the exception of the containment-side flange (CEP-V-2A), which had a leak rate exceeding its administrative limit. This flange was checked using a soap solution with test pressure applied and showed no external leakage. This visual inspection confirmed that the leakage recorded was into the system rather than a breach of the containment penetration. Sixty-six Type C tests were conducted. All but eight valves had as found leak rates below their administrative limits. The valves with leak rates in excess of their administrative limit required corrective actions to reduce their leak rates. Of the eight valves with as found leak rates in excess of their administrative limits, five required disassembly and rework, and one valve was replaced. The remaining two valves were successfully flushed and as-left tested without disassembly.

The total as found leakage at the beginning of Refueling Outage 19 (R19) was 19,712 standard cubic centimeters per minute (sccm). This equates to 16.2 percent of the total allowable containment leakage (La) of 121,536 sccm. The values from previous refueling outages (R18) and (R17) were 13,683 sccm and 20,879 sccm respectively.

The total as left leakage at the end of R19 was 13,098 sccm. This equates to 10.8 percent of the total allowable containment leakage (La) of 121,536 sccm and well below the maximum allowable startup containment leakage rate of 0.6La. The values from the previous refueling outages (R18) and (R17) were 14,051 sccm and 17,423 sccm, respectively.

The results of previous Type A tests are shown below. No Type A tests have failed to meet their acceptance criteria at Columbia.

Test Date	**Total Leakage (percent)**	**Acceptance Limit (percent)**
02/16/1984	0.2758	0.50
06/17/1987	0.3241	0.50
06/09/1991	0.319	0.50
07/20/1994	0.330	0.50
06/14/2009	0.3418	0.50

The health of the Appendix J Program is reported periodically in terms of performance indicators. The program health reports for 2007 ~~and 2008~~ to 2009 indicated no age-related concerns for systems and components within the scope of the Appendix J Program.

contain fuel oil. Quarterly sampling of the fuel oil tanks for the diesel-driven fire pumps has been effective at identifying unacceptable levels of water and sediment prior to a loss of function. Higher than expected amounts of water or sediment during periodic sampling has resulted in cleaning of the tanks and filtering of the fuel to restore acceptable conditions. The periodic cleaning and filtering has included the addition of a biocide due to evidence of biofouling.

To meet new Environmental Protection Agency requirements, Columbia will be transitioning to Ultra-Low-Sulfur Diesel (ULSD) fuel prior to the period of extended operation. ULSD fuel and its possible adverse impacts on diesel performance are addressed in NRC Information Notice 2006-022. The impact of using ULSD fuel on the Columbia design and licensing basis has been evaluated, including the consideration of related operating experience from the industry, and corrective actions assigned to account for the future transition. ~~Columbia will provide notification of any changes to the Fuel Oil Chemistry Program as a result of the transition to ULSD fuel.~~

Replace with Insert A below

Conclusion

The Fuel Oil Chemistry Program will manage loss of material and cracking for susceptible components through monitoring and control of contaminants in the fuel oil. The Fuel Oil Chemistry Program provides reasonable assurance that the aging effects will be managed such that components subject to aging management review will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

Insert A:
Energy Northwest determined that there are no compatibility issues and that no corrective actions or modifications are necessary as a result of the transition to ULSD fuel.

0 19

- Confirmation Process
  This element is common to Columbia programs and activities that are credited with aging management during the period of extended operation and is discussed in Section B.1.3.

- Administrative Controls
  This element is common to Columbia programs and activities that are credited with aging management during the period of extended operation and is discussed in Section B.1.3.

- Operating Experience
  The Metal-Enclosed Bus Program is a new program for which there is no direct site-specific operating experience. Based on review of plant-specific and industry operating experience, the identified aging effects require management for the period of extended operation.

  Plant operating experience has shown that the corrective action program has addressed issues related to bus and bus enclosure degradation in recent years. For example, corrosion was identified on insulators used to support bus associated with the unit normal auxiliary transformer (which is not in scope for license renewal). In addition, the corrective action program noted that the use of thermography would provide an improvement to the bus preventive maintenance program. Industry operating experience will be included in the development of this program.

Add Insert A shown below here

Required Enhancements

Not applicable, this is a new program.

Conclusion

The Metal-Enclosed Bus Program will manage aging degradation for metal-enclosed bus. The Metal-Enclosed Bus Program will provide reasonable assurance that the aging effects will be managed such that metal-enclosed bus subject to aging management review will continue to perform its intended functions consistent with the current licensing basis for the period of extended operation.

Insert A:
Also, in August 2009, there was a failure of a 6.9 kV non-segregated metal-enclosed bus (this bus not in the license renewal scope). The corrective action program is addressing the cause and actions needed to prevent reoccurrence on plant metal-enclosed busses.

Amendment 1

O 20-1

of whether failures were maintenance preventable. A review of the Maintenance Rule program periodic assessments did not identify any age-related functional failures related to structures. Two non-age related functional failures identified were that the Reactor Building crane was parked without the tornado latches installed and a 10 CFR 21 notice from Whiting Crane Corporation regarding a weld defect on the Reactor Building crane main trolley.

Replace with "documented"

A ~~recent~~ condition report ~~documents~~ a surface flaw noted in the concrete of the west exterior wall of the Reactor Building. The surface flaw appears to have existed for a significant period of time with no apparent adverse effects on secondary containment or the Reactor Building structure. Add Insert A on page B-196a

NRC Unresolved Item (URI) 05000397/2007005-02 was issued in February of 2008. This URI identified that Columbia had not performed nor scheduled condition monitoring, inspection, or preventative maintenance (since receiving an operating license in 1983) of the submerged portion of the suppression chamber, the standby service water spray ponds, or the condensate storage tanks. The URI stated that although the licensee performed some monitoring of these structures, failure to perform monitoring of the submerged portion of these structures could result in undetected cracks or leakage that could prevent them from meeting their design basis functions. This URI was documented in a condition report ~~that is currently being~~ resolved under the corrective action process with closure information ~~expected near the time of the LRA submittal~~.

Replace with "reviewed and accepted by the NRC"

Replace with "and has been"

The Structures Monitoring Program provides reasonable assurance that aging effects are being managed. This has been demonstrated through inspection reports, program health reports, periodic assessments, and the corrective action program.

The site corrective action program and ongoing review of industry operating experience will be used to ensure that the program continues to be effective in managing the identified aging effects.

Conclusion

The Structures Monitoring Program, with enhancements, will be capable of detecting and managing aging effects for structures within the scope of license renewal. The continued implementation of the Structures Monitoring Program, with the required enhancements, provides reasonable assurance that the effects of aging will be managed so that components subject to aging management review will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

O 20-1

Insert A for LRA Section B.2.50, Page B-196

Investigation concluded that the crack has existed since construction and was repaired by grout material. A visual inspection of the cracked area determined additional sealing was required in order to prevent potential corrosion of reinforcing steel. The surface flaw crack has been partially sealed at the north end to close up the wider portion of the gap. The location of the surface flaw has been noted for re-inspection and future trending by the Structural Monitoring Program.

O 20-2

Operating Experience

The Water Control Structures Inspection has been effective in managing the identified aging effects. Visual inspections conducted by the Water Control Structures Inspection, implemented as part of the Structures Monitoring Program, have found no age-related problems.

The general structural condition of Standby Service Water Pump Houses “A” and “B” and their associated spray ponds is good. No adverse conditions or deficiencies (cracking, spalling, or honeycombs) were noted during the inspection of concrete structural elements (walls, slabs, beams, etc.) that would affect the structural integrity of either pump house or spray pond. Equipment anchorages were secured. No degraded conditions (bent or twisted members, cracked welds, loose or missing fasteners, etc) were identified for steel members. The “saddle” supports for the ring header were noted to have the coating delaminating in places. However, there were only minor amounts of corrosion products at those locations (i.e., not a structural concern). Pipe supports on spray pond walls were in good shape with all fasteners installed and tight. Doors and frames did not show any evidence of a degraded condition. There were no signs of moisture intrusion from the roof above and no signs of gross deficiencies (spalling, cracking, honeycombs) found from below. There were no obvious deficiencies identified with the crane structural frames. The rails appeared in good physical condition with no obvious signs of degradation such as bent or deformed rails. The Standby Service Water Pump Houses and the Spray Ponds are capable of performing their intended design function as the ultimate heat sink in response to accident conditions.

Replace with "and has been"

NRC Unresolved Item (URI) 05000397/2007005-02 was issued in February of 2008. This URI identified that Columbia had not performed nor scheduled condition monitoring, inspection, or preventative maintenance (since receiving an operating license in 1983) of the submerged portion of the suppression chamber, the standby service water spray ponds, or the condensate storage tanks. The URI stated that although the licensee performed some monitoring of these structures, failure to perform monitoring of the submerged portion of these structures could result in undetected cracks or leakage that could prevent them from meeting their design basis functions. This URI was documented in a condition report ~~that is currently being~~ resolved under the corrective action process with closure information ~~expected near the time of the LRA submittal~~.

Replace with "reviewed and accepted by the NRC"

The general conditions noted for the Circulating Water Pump House (including circulating water basin) and the cooling tower basins, including the structural components within the structures, was acceptable. Minor leaching was observed in the Circulating Water Pump House on a concrete pad near the interface with the siding, in addition to cracks in the wall along joints due to stresses caused by a hanger attached to the wall above the door, corrosion on the lower section of various door frames, and

O 47

frequency in that degradation of cranes (including bridge, trolley, rails, and girders), monorails, and hoists was detected prior to loss of function. Related crane and hoist inspections have found no age-related degradation problems.

The health of the Material Handling System Inspection Program is reported periodically in terms of performance indicators. The program health reports for 2007 ~~and 2008~~ noted no age-related improvements for the program.

The Material Handling System Inspection Program has been effective in managing the identified aging effects. The site corrective action program and ongoing review of industry operating experience will be used to ensure that the program continues to be effective in managing the identified aging effects.

replace with "to 2009"

Conclusion

The Material Handling System Inspection Program will be capable of detecting and managing loss of material for cranes (including bridge, trolley, rails, and girders), monorails, and hoists within the scope of license renewal. The continued implementation of the Material Handling System Inspection Program~~, with the required enhancement~~, provides reasonable assurance that the aging effects will be managed such that components subject to aging management review will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

Amendment 1

Summary of Reference Update Review Changes

Change Number	Summary	Changed or new pages
6	Deleted cracking of stainless steel (SS) for the Radwaste Building HVAC System piping from the External Surfaces Monitoring Program. Cracking of SS occurs when temperatures are greater than 140°F. The Radwaste Building HVAC maximum temperature exposure is 120°F. Therefore, cracking is not an applicable aging effect. The Radwaste Building HVAC has the only SS piping subject to cracking that had been covered by the program.	3.3-325 A-49 B-101 B-102 B-103
7	Deleted cracking as an aging effect for the aluminum alloy in the following systems: Diesel Building HVAC Potable Cold Water (PWC) Pump House HVAC Systems Radwaste Building HVAC Systems Reactor Building HVAC Systems The aluminum alloys do not exceed the limits of > 12% zinc or > 6% magnesium for alloys exposed to a condensation environment. The plant specific note was added for further clarification.	3.3-34 3.3-180 3.3-181 3.3-287 3.3-288 3.3-307 3.3-308 3.3-309 3.3-320 3.3-321 3.3-333 3.3-334 3.3-400 3.3-400a
8	Removed some of the Reactor Recirculation Air (RRA) cooling coils from the list because the aluminum alloy fins have been replaced with cooper alloy.	3.3-334

Summary of Reference Update Review Changes

Change Number	Summary	Changed or new pages
9	Materials in the Process Sampling (PS) System have been updated to include copper alloys with > 15% zinc. As a result, a new aging effect of cracking was added. An additional program, Monitoring and Collection System Inspection, is required to manage the new aging effect in the PS. Removed cracking as an aging effect managed by the Open Cycle Cooling Water Program.	3.3-36 3.3-294 3.3-340 3.3-340a A-22 B-160 B-160a B-163
10	Removed the management of drain pans and drain piping for the diesel building HVAC from the Diesel System Inspection because the components are included in the Cooling Units Inspection. The management is addressed in the Cooling Units Inspection and does not need to be covered in both sections.	A-13 A-46 B-77 B-78
11	Deleted the commitment to enhance the existing Material Handling System Inspection Program by ensuring that jib cranes and electronically operated hoists are visually inspected for corrosion. The enhancement has been added to the program and the inspection will be tracked as a regulatory commitment.	A-21 A-56 B-23 B-153 B-154
12	The fire requirement for the masonry walls in the Diesel Fire Pump Fuel Storage Tank Room has been changed from 3-hour to 2-hour	2.4-21
13	Secondary Containment isolation was added to the function of the HPCS System.	2.3-24 2.3-24a
14	The Diesel Fuel Oil (DO) System description was changed to reflect the editorial changes made to FSAR sections 8.3.1.1.7.2.6 and 9.5.4.2 in Amendment 60, submitted to the NRC in December 2009.	2.3-80 2.3-80a

Summary of Reference Update Review Changes		
Change Number	**Summary**	**Changed or new pages**
15	Based on a review of Columbia operating cycle history, new estimates are shown for the expected reactor thermal cycles that Columbia could reasonably expect to occur over a 60 year operating life. The actual cycles in the same table were updated based on results of the surveillance performed in accordance with Technical Specification 5.5.5, "Component Cyclic or Transient Limit."	4.3-4 4.3-4a
45	Revised the description of the Fire Protection (FP) System to clarify that the diesel engines referred to are the fire pump diesel engines. The discussion that excluded the jockey pumps from the scope of license renewal was deleted from the section describing components <u>that are in scope</u>. This is a presentation issue and does not impact the scoping status of the jockey pumps. Further clarification was provided by dividing the strainer into 2 components; the strainer body and the strainer screen. This was done to clarify that the 2 parts of the strainer provide different intended functions.	2.3-95 2.3-96 2.3-97 2.3-97a
46	The FP System has spray nozzles made from copper alloy with > 15% zinc. Although Energy Northwest has not identified an aging mechanism for this material when exposed to fire water, the existing FP program inspects the spray nozzles to confirm the absence of aging effects. Therefore, the aging management review results were revised to include this aspect of the FP program. A plant specific note (0327) was added to Table 3.3.2-xx was added. Appendix B (B.2.26) includes this discussion and no change is required for that section.	3.3-248 3.3-249 3.3-400 3.3-400a

R 6-1

Table 3.3.2-36 Aging Management Review Results – Radwaste Building HVAC Systems

Delete row 66

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
65	Piping	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
~~66~~	~~Piping~~	~~Structural integrity~~	~~Stainless Steel~~	~~Condensation (External)~~	~~Cracking~~	~~External Surfaces Monitoring~~	~~N/A~~	~~N/A~~	~~H~~
67	Piping	Structural integrity	Stainless Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.F2-1	3.3.1-27	E
68	Sound Absorber Casing	Pressure boundary	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	C 0302
69	Sound Absorber Casing	Pressure boundary	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
70	Strainer (body)	Structural integrity	Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-19	3.3.1-76	B
71	Strainer (body)	Structural integrity	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.I-11	3.3.1-58	A
72	Tubing	Pressure boundary	Copper Alloy	Air-indoor uncontrolled (Internal)	None	None	N/A	N/A	G
73	Tubing	Pressure boundary	Copper Alloy	Air-indoor uncontrolled (External)	None	None	N/A	N/A	G

Amendment 1

R 6-2

Table A-1
Columbia License Renewal Commitments

Item Number	Commitment	FSAR Supplement Location (LRA App. A)	Enhancement or Implementation Schedule
23) External Surfaces Monitoring Program	The External Surfaces Monitoring Program is an existing program that will be continued for the period of extended operation, with the following enhancements: • Add aluminum, copper alloy, copper alloy >15 % Zn, gray cast iron, stainless steel (including CASS), and elastomers to the scope of the program. • Add cracking as an aging effect for aluminum ~~and stainless steel~~ components. • Add visual (VT-1 or equivalent) or volumetric examination techniques to detect cracking. • Add hardening and loss of strength as aging effects for elastomer-based mechanical sealants and flexible connections in HVAC systems. • Add physical examination techniques in addition to visual inspection to detect hardening and loss of strength for elastomer-based mechanical sealants and flexible connections in HVAC systems.	A.1.2.23	Enhancement prior to the period of extended operation. Then ongoing.
24) Fatigue Monitoring Program	The Fatigue Monitoring Program is an existing program that will be continued for the period of extended operation, with the following enhancements:	A.1.2.24 A.1.3.2 A.1.3.4	Enhancement prior to the period of extended operation. Then ongoing.

Amendment 1

R 6-3

B.2.23 External Surfaces Monitoring Program

Program Description

The External Surfaces Monitoring Program will manage the following aging effects for the external surfaces, and in some cases the internal surfaces, of mechanical components within the scope of license renewal:

- Loss of material for metals (aluminum, copper alloy, copper alloy > 15% Zn, gray cast iron, stainless steel (including CASS), and steel) that are exposed to condensation, air-indoor uncontrolled, and air-outdoor environments
- Cracking of aluminum ~~and stainless steel~~ exposed to condensation environments
- Hardening and loss of strength for elastomer-based mechanical sealants and flexible connections in HVAC systems

The External Surfaces Monitoring Program is a condition monitoring program that consists of visual inspections and surveillance activities of accessible external surfaces on a frequency that generally exceeds once per fuel cycle. Surfaces that are inaccessible during normal plant operation are inspected during refueling outages. Surfaces that are inaccessible or not readily visible during both plant operations and refueling outages, such as surfaces that are insulated, are inspected opportunistically, for example during maintenance activities during which insulation is removed.

The External Surfaces Monitoring Program is supplemented by the Aboveground Steel Tanks Inspection to manage loss of material for the inaccessible external surfaces of the carbon steel condensate storage tanks (i.e., the tank bottom).

NUREG-1801 Consistency

The External Surfaces Monitoring Program is an existing Columbia program that, with enhancement, will be consistent with the 10 elements of an effective aging management program as described in NUREG-1801, Section XI.M36, "External Surfaces Monitoring."

Exceptions to NUREG-1801

None.

Required Enhancements

Prior to the period of extended operation the enhancements listed below will be implemented in the identified program element:

R 6-4

- **Scope of Program –**
  - Add aluminum, copper alloy, copper alloy >15% Zn, gray cast iron, stainless steel (including CASS), and elastomers to the scope of the program.
  - Add cracking as an aging effect for aluminum ~~and stainless steel~~ components.
  - Add hardening and loss of strength as aging effects for elastomer-based mechanical sealants and flexible connections in HVAC systems.
- **Monitoring and Trending –**
  - Add physical examination techniques in addition to visual inspection to detect hardening and loss of strength for elastomer-based mechanical sealants and flexible connections in HVAC systems.
  - Add visual (VT-1 or equivalent) or volumetric examination techniques to detect cracking.

Operating Experience

The elements that comprise the External Surfaces Monitoring Program are consistent with industry practice and have proven effective in maintaining the material condition of Columbia plant systems and components.

A review of the most recent plant-specific operating experience, through a search of condition reports, revealed that minor component leakage (typically at bolted joints and closures), damage (event-driven, not age-related), and degradation are routinely identified by the External Surfaces Monitoring Program, with subsequent corrective actions taken in a timely manner; and that no loss of pressure boundary integrity has occurred that was, or could have been, attributed to the aging effects that are in the scope of the program.

Operating experience associated with the External Surfaces Monitoring Program is routinely documented and communicated to site personnel in System Health Reports. System Health Reports are updated after significant changes, or at least quarterly.

R 6-5

Conclusion

The External Surfaces Monitoring Program will detect and manage loss of material for aluminum, copper alloy, copper alloy >15% Zn, gray cast iron, stainless steel (including CASS), and steel components. The continued implementation of the External Surfaces Monitoring Program, with the required enhancements, provides reasonable assurance that the effects of aging, including cracking for aluminum ~~and stainless steel~~ components and hardening and loss of strength for elastomer-based mechanical sealants and flexible connections in HVAC systems, will be managed such that components subject to aging management will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

Environments

Subject mechanical components of the Potable Cold Water System are exposed to the following normal operating environments:

- Condensation
- Raw water

Aging Effects Requiring Management

The following aging effects require management for the subject mechanical components of the Potable Cold Water System:

- ~~Cracking~~
- Loss of material

Aging Management Programs

The following aging management programs manage the aging effects for subject mechanical components of the Potable Cold Water System:

- External Surfaces Monitoring Program
- Potable Water Monitoring Program
- Selective Leaching Inspection

3.3.2.1.30 Potable Hot Water System

Materials

The materials of construction for subject mechanical components of the Potable Hot Water System are:

- Copper alloy
- Copper alloy > 15% Zn

Environments

Subject mechanical components of the Potable Hot Water System are exposed to the following normal operating environments:

- Air-indoor uncontrolled
- Raw water

R 7-2

Table 3.3.2-14 Aging Management Review Results – Diesel Building HVAC Systems

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
18	Fan Housing (DEA-FN-11, 12, 21, 22, 31, 32 & 52)	Pressure boundary	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	C 0302
19	Fan Housing (DEA-FN-11, 12, 21, 22, 31, 32 & 52)	Pressure boundary	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
20	Flexible Connection	Pressure boundary	Elastomer	Air-indoor uncontrolled (Internal)	Hardening and loss of strength	External Surfaces Monitoring	VII.F4-6	3.3.1-11	E
21	Flexible Connection	Pressure boundary	Elastomer	Air-indoor uncontrolled (External)	Hardening and loss of strength	External Surfaces Monitoring	VII.F4-6	3.3.1-11	E
22	Heat Exchanger (header) (DMA-CC-11, 12, 21, 22, 31 & 32)	Pressure boundary	Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-5	3.3.1-77	B
23	Heat Exchanger (header) (DMA-CC-11, 12, 21, 22, 31 & 32)	Pressure boundary	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.I-11	3.3.1-58	A
~~24~~	~~Heat Exchanger (fins) (DMA-CC-11, 12, 21, 22, 31 & 32)~~	~~Heat transfer~~	~~Aluminum~~	~~Condensation (External)~~	~~Cracking~~	~~Open-Cycle Cooling Water~~	~~N/A~~	~~N/A~~	~~H~~

Delete row 24

Amendment 1

R 7-3

Table 3.3.2-14 Aging Management Review Results – Diesel Building HVAC Systems

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
25	Heat Exchanger (fins) (DMA-CC-11, 12, 21, 22, 31 & 32)	Heat transfer	Aluminum	Condensation (External)	Loss of material	Open-Cycle Cooling Water	VII.F2-12	3.3.1-27	E Add: 0325
26	Heat Exchanger (fins) (DMA-CC-11, 12, 21, 22, 31 & 32)	Heat transfer	Aluminum	Condensation (External)	Reduction in heat transfer	Open-Cycle Cooling Water	N/A	N/A	H
27	Heat Exchanger (tubes) (DMA-CC-11, 12, 21, 22, 31 & 32)	Heat transfer	Copper Alloy	Raw water (Internal)	Reduction in heat transfer	Open-Cycle Cooling Water	VII.C1-6	3.3.1-83	B
28	Heat Exchanger (tubes) (DMA-CC-11, 12, 21, 22, 31 & 32)	Heat transfer	Copper Alloy	Condensation (External)	Reduction in heat transfer	Open-Cycle Cooling Water	N/A	N/A	H
29	Heat Exchanger (tubes) (DMA-CC-11, 12, 21, 22, 31 & 32)	Pressure boundary	Copper Alloy	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-3	3.3.1-82	B
30	Heat Exchanger (tubes) (DMA-CC-11, 12, 21, 22, 31 & 32)	Pressure boundary	Copper Alloy	Condensation (External)	Loss of material	Open-Cycle Cooling Water	VII.F2-14	3.3.1-25	E

R 7-4

Table 3.3.2-29 Aging Management Review Results – Potable Cold Water System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
10	Pump Casing (PWC-P-4A/B)	Structural integrity	Copper Alloy > 15% Zn	Condensation (External)	Loss of material	Selective Leaching Inspection	N/A	N/A	G
11	Shock Suppressor	Structural integrity	Copper Alloy	Raw water (Internal)	Loss of material	Potable Water Monitoring	VII.C1-9	3.3.1-81	E
12	Shock Suppressor	Structural integrity	Copper Alloy	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.F1-16	3.3.1-25	E
13	Strainer (body)	Structural integrity	Copper Alloy > 15% Zn	Raw water (Internal)	Loss of material	Potable Water Monitoring	VII.C1-9	3.3.1-81	E
14	Strainer (body)	Structural integrity	Copper Alloy > 15% Zn	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.F1-16	3.3.1-25	E
15	Strainer (body)	Structural integrity	Copper Alloy > 15% Zn	Condensation (External)	Loss of material	Selective Leaching Inspection	N/A	N/A	G
16	Strainer (body)	Structural integrity	Copper Alloy > 15% Zn	Raw water (Internal)	Loss of material	Selective Leaching Inspection	VII.C1-10	3.3.1-84	A
17	Tank (shell and end cap)	Structural integrity	Aluminum	Raw water (Internal)	Loss of material	Potable Water Monitoring	VII.G-8	3.3.1-62	E
18	Tank (shell and end cap)	Structural integrity	Aluminum	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.F1-14	3.3.1-27	E

Insert: 0325

Amendment 1

R 7-5

Delete row 19

Table 3.3.2-29 Aging Management Review Results – Potable Cold Water System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
~~19~~	Tank (shell and end cap)	Structural integrity	~~Aluminum~~	Condensation (External)	~~Cracking~~	External ~~Surfaces~~ Monitoring	~~N/A~~	~~N/A~~	~~H~~
20	Tank (bushing)	Structural integrity	Gray Cast Iron	Raw water (Internal)	Loss of material	Potable Water Monitoring	VII.G-24	3.3.1-68	E
21	Tank (bushing)	Structural integrity	Gray Cast Iron	Raw water (Internal)	Loss of material	Selective Leaching Inspection	VII.C1-11	3.3.1-85	C
22	Tank (bushing)	Structural integrity	Gray Cast Iron	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.I-11	3.3.1-58	A
23	Tank (bushing)	Structural integrity	Gray Cast Iron	Condensation (External)	Loss of material	Selective Leaching Inspection	N/A	N/A	G
24	Tubing	Structural integrity	Copper Alloy	Raw water (Internal)	Loss of material	Potable Water Monitoring	VII.C1-9	3.3.1-81	E
25	Tubing	Structural integrity	Copper Alloy	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.F1-16	3.3.1-25	E
26	Tubing	Structural integrity	Copper Alloy > 15% Zn	Raw water (Internal)	Loss of material	Potable Water Monitoring	VII.C1-9	3.3.1-81	E
27	Tubing	Structural integrity	Copper Alloy > 15% Zn	Raw water (Internal)	Loss of material	Selective Leaching Inspection	VII.C1-10	3.3.1-84	A

Amendment 1

R 7-6

Table 3.3.2-34 Aging Management Review Results – Pump House HVAC Systems

Delete Row 36

Add: 0325

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
34	Heat Exchanger (header) (PRA-CC-1A/B, 91A/B)	Pressure boundary	Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-5	3.3.1-77	B
35	Heat Exchanger (header) (PRA-CC-1A/B, 91A/B)	Pressure boundary	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.I-11	3.3.1-58	A
~~36~~	Heat Exchanger ~~(fins) (PRA-~~ CC-1A/B, 91A/B)	~~Heat transfer~~	~~Aluminum~~	~~Condensation~~ (External)	~~Cracking~~	~~Open-Cycle~~ Cooling Water	~~N/A~~	~~N/A~~	~~H~~
37	Heat Exchanger (fins) (PRA-CC-1A/B, 91A/B)	Heat transfer	Aluminum	Condensation (External)	Loss of material	Open-Cycle Cooling Water	VII.F2-12	3.3.1-27	E
38	Heat Exchanger (fins) (PRA-CC-1A/B, 91A/B)	Heat transfer	Aluminum	Condensation (External)	Reduction in heat transfer	Open-Cycle Cooling Water	N/A	N/A	H
39	Heat Exchanger (tubes) (PRA-CC-1A/B, 91A/B)	Heat transfer	Copper Alloy	Raw water (Internal)	Reduction in heat transfer	Open-Cycle Cooling Water	VII.C1-6	3.3.1-83	B

Amendment 1

R 7-7

Table 3.3.2-34 Aging Management Review Results – Pump House HVAC Systems									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
40	Heat Exchanger (tubes) (PRA-CC-1A/B, 91A/B)	Heat transfer	Copper Alloy	Condensation (External)	Reduction in heat transfer	Open-Cycle Cooling Water	N/A	N/A	H
41	Heat Exchanger (tubes) (PRA-CC-1A/B, 91A/B)	Pressure boundary	Copper Alloy	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-3	3.3.1-82	B
42	Heat Exchanger (tubes) (PRA-CC-1A/B, 91A/B)	Pressure boundary	Copper Alloy	Condensation (External)	Loss of material	Open-Cycle Cooling Water	VII.F2-14	3.3.1-25	E
43	Heat Exchanger (header) (PMA-CC-81A/B)	Pressure boundary	Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-5	3.3.1-77	B
44	Heat Exchanger (header) (PMA-CC-81A/B)	Pressure boundary	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.I-11	3.3.1-58	A
~~45~~	~~Heat Exchanger (fins) (PMA-CC-81A/B)~~	~~Heat transfer~~	~~Aluminum~~	~~Condensation (External)~~	~~Cracking~~	~~Open-Cycle Cooling Water~~	~~N/A~~	~~N/A~~	~~H~~

Delete Row 45

Amendment 1

R-7-8

Table 3.3.2-34 Aging Management Review Results – Pump House HVAC Systems

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
46	Heat Exchanger (fins) (PMA-CC-81A/B)	Heat transfer	Aluminum	Condensation (External)	Loss of material	Open-Cycle Cooling Water	VII.F2-12	3.3.1-27	E
47	Heat Exchanger (fins) (PMA-CC-81A/B)	Heat transfer	Aluminum	Condensation (External)	Reduction in heat transfer	Open-Cycle Cooling Water	N/A	N/A	H
48	Heat Exchanger (tubes) (PMA-CC-81A/B)	Heat transfer	Copper Alloy	Raw water (Internal)	Reduction in heat transfer	Open-Cycle Cooling Water	VII.C1-6	3.3.1-83	B
49	Heat Exchanger (tubes) (PMA-CC-81A/B)	Heat transfer	Copper Alloy	Condensation (External)	Reduction in heat transfer	Open-Cycle Cooling Water	N/A	N/A	H
50	Heat Exchanger (tubes) (PMA-CC-81A/B)	Pressure boundary	Copper Alloy	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-3	3.3.1-82	B
51	Heat Exchanger (tubes) (PMA-CC-81A/B)	Pressure boundary	Copper Alloy	Condensation (External)	Loss of material	Open-Cycle Cooling Water	VII.F2-14	3.3.1-25	E
52	Mechanical Sealants	Pressure boundary	Elastomer	Air-indoor uncontrolled (Internal)	Hardening and loss of strength	External Surfaces Monitoring	VII.F1-7	3.3.1-11	E
53	Mechanical Sealants	Pressure boundary	Elastomer	Air-indoor uncontrolled (External)	Hardening and loss of strength	External Surfaces Monitoring	VII.F1-7	3.3.1-11	E

Add: 0325

Amendment 1

R 7-9

Table 3.3.2-36 Aging Management Review Results – Radwaste Building HVAC Systems

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
37	Heat Exchanger (header) (WMA-CC-51A2, 51B2, 52A2 & 52B2)	Pressure boundary	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.I-11	3.3.1-58	A
38	Heat Exchanger (fins) (WMA-CC-51A2, 51B2, 52A2 & 52B2)	Heat transfer	Aluminum	Condensation (External)	Cracking	Cooling Units Inspection	N/A	N/A	H
39	Heat Exchanger (fins) (WMA-CC-51A2, 51B2, 52A2 & 52B2)	Heat transfer	Aluminum	Condensation (External)	Loss of material	Cooling Units Inspection	VII.F2-12	3.3.1-27	E
40	Heat Exchanger (fins) (WMA-CC-51A2, 51B2, 52A2 & 52B2)	Heat transfer	Aluminum	Condensation (External)	Reduction in heat transfer	Cooling Units Inspection	N/A	N/A	H
~~41~~	~~Heat Exchanger (fins) (WMA-CC-53A2 & 53B2)~~	~~Heat transfer~~	~~Aluminum~~	~~Condensation (External)~~	~~Cracking~~	~~Open-Cycle Cooling Water~~	~~N/A~~	~~N/A~~	~~H~~

Delete Row 41

Amendment 1

R 7·10

Table 3.3.2-36 Aging Management Review Results – Radwaste Building HVAC Systems

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
42	Heat Exchanger (fins) (WMA-CC-53A2 & 53B2)	Heat transfer	Aluminum	Condensation (External)	Loss of material	Open-Cycle Cooling Water	VII.F2-12	3.3.1-27	E Add: 0325
43	Heat Exchanger (fins) (WMA-CC-53A2 & 53B2)	Heat transfer	Aluminum	Condensation (External)	Reduction in heat transfer	Open-Cycle Cooling Water	N/A	N/A	H
44	Heat Exchanger (tubes) (WMA-CC-51A1, 51B1, 52A1, 52B1, 53A1, 53A2, 53B1 & 53B2	Heat transfer	Copper Alloy	Condensation (External)	Reduction in heat transfer	Open-Cycle Cooling Water	N/A	N/A	H
45	Heat Exchanger (tubes) (WMA-CC-51A1, 51B1, 52A1, 52B1, 53A1, 53A2, 53B1 & 53B2)	Heat transfer	Copper Alloy	Raw water (Internal)	Reduction in heat transfer	Open-Cycle Cooling Water	VII.C1-6	3.3.1-83	B

Amendment 1

R 7.11

Table 3.3.2-37 Aging Management Review Results – Reactor Building HVAC Systems									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
33	Heat Exchanger (housing) (ROA-HC-1 & 2)	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
34	Heat Exchanger (header) (RRA-CC-1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 14, 15, 17, 19 & 20)	Pressure boundary	Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-5	3.3.1-77	B
35	Heat Exchanger (header) (RRA-CC-1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 14, 15, 17, 19 & 20)	Pressure boundary	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.I-11	3.3.1-58	A
~~36~~	~~Heat Exchanger (fins) (RRA-CC-1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 14, 15, 17, 19 & 20)~~	~~Heat transfer~~	~~Aluminum~~	~~Condensation (External)~~	~~Cracking~~	~~Open-Cycle Cooling Water~~	~~N/A~~	~~N/A~~	~~H~~

Delete row 36

Amendment 1

R 7-12

Table 3.3.2-37 Aging Management Review Results – Reactor Building HVAC Systems

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
37	Heat Exchanger (fins) (RRA-CC-1, 2, 3, 4, 5, 6, 10, 11, ~~12, 13, 14, 15~~, ~~17, 19 & 20~~)	Heat transfer	Aluminum	Condensation (External)	Loss of material	Open-Cycle Cooling Water	VII.F2-12	3.3.1-27	E Add: 0325
38	Heat Exchanger (fins) (RRA-CC-1, 2, 3, 4, 5, 6, 10, 11, ~~12, 13, 14, 15~~, ~~17, 19 & 20~~)	Heat transfer	Aluminum	Condensation (External)	Reduction in heat transfer	Open-Cycle Cooling Water	N/A	N/A	H
39	Heat Exchanger (header) (ROA-HC-1 & 2)	Structural integrity	Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
40	Heat Exchanger (header) (ROA-HC-1 & 2)	Structural integrity	Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
41	Heat Exchanger (header) (ROA-HC-1 & 2)	Structural integrity	Steel	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G

R 7-13

Plant-Specific Notes:	
0315	The BWR Water Chemistry Program and Chemistry Program Effectiveness Inspection will manage loss of material of components submerged in the suppression pool and subject to a treated water environment.
0316	The fire protection diesel engine coolant (antifreeze) is evaluated as Raw Water.
0317	The Fire Water Program also manages loss of material due to selective leaching of fire sprinkler system spray nozzles that are normally exposed to a raw water (internal) environment. The copper alloy spray nozzles are inspected or replaced in accordance with the Fire Water Program; the inspection includes detection of selective leaching.
0318	For conservatism, it is assumed that ammonia or ammonium compounds are present in the raw water environment as a by-product of organic decay, as a by-product of MIC, or possibly from fertilizers.
0319	Subject component is exposed to reactor closed cooling (RCC) water.
0320	Subject component has an air-water interface that constitutes an agressive environment.
0321	Subject component is exposed to plant service water (TSW).
0322	Environment is predominantly outdoor air with infrequent, and for short duration, exposure to diesel exhaust.
0323	The internal environment between the outer and inner vessels of CN-TK-1 is conservatively evaluated as air instead of as a vacuum. Since the external surface is exposed to the more aggressive outdoor air environment, aging effects will occur on the external surface before they occur on the internal surface.
0324	The aging effect determination for the Air-outdoor (Internal) environment is the same as the NUREG-1801 determination for an Air-outdoor (External) environment because the material is the same and the internal environment is equivalent to the external environment evaluated in the NUREG-1801 item. Monitoring of the external surface condition will be used to characterize the aging effects on the internal surfaces.

Insert A shown on page 3.3-400a

R 7-13

Insert A to LRA Page 3.3-400

0325	The material is not aluminum alloy > 12% Zinc or 6% Magnesium, which is required for the mechanism of cracking due to stress corrosion cracking to be applicable.
0326	Based on a review of recent operating experience, the bottom portion of the air-handling unit housings for WMA-AH-51A/B are evaluated as exposed to an internal environment of condensation.
0327	No aging effects requiring management have been identified. However, for all brass (copper alloy > 15% Zn) spray nozzles that are in the scope of license renewal, the Fire Water Program is credited to provide confirmation of the absence of significant aging effects during the period of extended operation.

R 8

Table 3.3.2-37 Aging Management Review Results – Reactor Building HVAC Systems

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
37	Heat Exchanger (fins) (RRA-CC-1, 2, 3, 4, 5, 6, 10, 11, ~~12, 13, 14, 15, 17, 19 & 20~~)	Heat transfer	Aluminum	Condensation (External)	Loss of material	Open-Cycle Cooling Water	VII.F2-12	3.3.1-27	E Add: 0325
38	Heat Exchanger (fins) (RRA-CC-1, 2, 3, 4, 5, 6, 10, 11, ~~12, 13, 14, 15, 17, 19 & 20~~)	Heat transfer	Aluminum	Condensation (External)	Reduction in heat transfer	Open-Cycle Cooling Water	N/A	N/A	H
39	Heat Exchanger (header) (ROA-HC-1 & 2)	Structural integrity	Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
40	Heat Exchanger (header) (ROA-HC-1 & 2)	Structural integrity	Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
41	Heat Exchanger (header) (ROA-HC-1 & 2)	Structural integrity	Steel	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G

R 9-1

3.3.2.1.32 Process Sampling System

Materials

The materials of construction for subject mechanical components of the Process Sampling System are:

- Copper alloy
- Copper alloy > 15% Zn
- Polymer
- Stainless steel
- Steel

Environments

Subject mechanical components of the Process Sampling System are exposed to the following normal operating environments:

- Condensation
- Raw water

Aging Effects Requiring Management

The following aging effects require management for the subject mechanical components of the Process Sampling System:

- Cracking
- Loss of material
- Loss of pre-load

Aging Management Programs

The following aging management programs manage the aging effects for subject mechanical components of the Process Sampling System:

- Bolting Integrity Program
- External Surfaces Monitoring Program
- Open-Cycle Cooling Water Program
- Selective Leaching Inspection

Add:
"Monitoring and Collection Systems Inspection"

Amendment 1

R 9-2

Table 3.3.2-32 Aging Management Review Results – Process Sampling System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
10	Strainer (body)	Structural integrity	Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-19	3.3.1-76	B
11	Strainer (body)	Structural integrity	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.I-11	3.3.1-58	A
12	Tubing	Structural integrity	Copper Alloy	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-9	3.3.1-81	B
13	Tubing	Structural integrity	Copper Alloy	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.F1-16	3.3.1-25	E
14	Tubing	Structural integrity	Stainless Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-15	3.3.1-79	B
15	Tubing	Structural integrity	Stainless Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.F1-1	3.3.1-27	E
16	Valve Body	Structural integrity	Copper Alloy > 15% Zn	Raw water (Internal)	Cracking	~~Open-Cycle Cooling Water~~ Monitoring and Collection Systems Inspection	N/A	N/A	H
17	Valve Body	Structural integrity	Copper Alloy > 15% Zn	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-9	3.3.1-81	B
18	Valve Body	Structural integrity	Copper Alloy > 15% Zn	Raw water (Internal)	Loss of material	Selective Leaching Inspection	VII.C1-10	3.3.1-84	A

Amendment 1

R 9-3

Table 3.3.2-37 Aging Management Review Results – Reactor Building HVAC Systems									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
80	Valve Body	Structural integrity	Steel	Raw water (Internal)	Loss of material	Potable Water Monitoring	VII.C1-19	3.3.1-76	E
81	Valve Body	Structural integrity	Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
82	Valve Body	Structural integrity	Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
83	Valve Body	Structural integrity	Steel	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
84	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
85	Valve Body	Structural integrity	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.I-11	3.3.1-58	A

Insert new rows 86 through 87 from Page 3.3-340a

Amendment 1

R 9-3

Table 3.3.2-37 Aging Management Review Results – Reactor Building HVAC Systems

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
86	Heat Exchanger (fins) (RRA-CC-12, 13, 14, 15, 17, 19, & 20)	Heat transfer	Copper Alloy	Condensation (External)	Loss of material	Open-Cycle Cooling Water	VII.F2-14	3.3.1-25	E
87	Heat Exchanger (fins) (RRA-CC-12, 13, 14, 15, 17, 19, & 20)	Heat transfer	Copper Alloy	Condensation (External)	Reduction in heat transfer	Open-Cycle Cooling Water	N/A	N/A	H

R 9-4

The Metal-Enclosed Bus Program is a new aging management program that will be implemented prior to the period of extended operation. The thermography portion of the program will be performed once every 10 years, with the initial inspections to be performed prior to the period of extended operation. The visual inspection portion of the program will also be performed once every 10 years, with the first inspections to be performed prior to the period of extended operation.

A.1.2.41 Monitoring and Collection Systems Inspection

The Monitoring and Collection Systems Inspection detects and characterizes the condition of materials at the internal surfaces of subject mechanical components that are exposed to equipment or area drainage water and other potential contaminants and fluids. The inspection provides direct evidence as to whether, and to what extent, a loss of material due to corrosion or erosion has occurred. The inspection also determines whether cracking due to SCC of susceptible materials has occurred.

The Monitoring and Collection Systems Inspection is a new one-time inspection that will be implemented prior to the period of extended operation. The inspection activities will be conducted within the 10-year period prior to the period of extended operation.

A.1.2.42 Open-Cycle Cooling Water Program

The Open-Cycle Cooling Water Program manages ~~cracking due to SCC of susceptible materials and~~ loss of material due to corrosion and erosion for components located in the Standby Service Water and Plant Service Water systems, and for components connected to or serviced by those systems. The program manages fouling due to particulates (e.g., corrosion products) and biological material (micro- or macro-organisms) resulting in reduction in heat transfer for heat exchangers (including condensers, coolers, cooling coils, and evaporators) within the scope of the program. The Open-Cycle Cooling Water Program also manages loss of material for components associated with the feed-and-bleed mode for emergency makeup water to the spray pond.

The Open-Cycle Cooling Water Program consists of inspections, surveillances, and testing to detect the presence, and assess the extent of ~~cracking, fouling,~~ and loss of material. The inspection activities are combined with chemical treatments and cleaning activities to minimize the effects of aging. The program is a combination condition monitoring and mitigation program that implements the recommendations of NRC Generic Letter 89-13 for safety-related equipment in the scope of the program. The scope of the program also includes non-safety related components containing either service water or spray pond makeup water.

Insert: "fouling"

The Open-Cycle Cooling Water Program is an existing program that requires enhancement prior to the period of extended operation.

R 9-5

- Floor Drains Radioactive (FDR) System
- Fuel Pool Cooling (FPC) System
- Miscellaneous Waste Radioactive (MWR) System
- Plant Sanitary Drains (PSD) System
- Process Sampling Radioactive (PSR) System
- Reactor Closed Cooling (RCC) Water System

Add:
Process Sampling
(PS) System

A representative sample of components in these systems, to be defined in the implementing documents, and to include containment isolation piping and valve bodies, will be examined for evidence of a loss of material (due to crevice, galvanic, general, or pitting corrosion, erosion, or MIC), or to confirm a lack thereof, and the results applied to all of the systems and components within the scope of the inspection, based on engineering evaluation. ~~In addition, the representative sample will include stainless steel components exposed to temperatures greater than 140 °F that will be examined for evidence of cracking due to SCC.~~

Replace with Insert A
on page B-160a

- Preventive Actions
  No actions are taken as part of the Monitoring and Collection Systems Inspection to prevent aging effects or to mitigate aging degradation.

- Parameters Monitored or Inspected
  The parameters to be inspected by the Monitoring and Collection Systems Inspection include wall thickness or visual evidence of internal surface degradation, as measures of a loss of material or cracking in susceptible materials. Inspections will be performed by qualified personnel using established NDE techniques.

- Detection of Aging Effects
  The Monitoring and Collection Systems Inspection will use a combination of established volumetric and visual examination techniques (such as equivalent to VT-1 or VT-3) performed by qualified personnel on a sample population of subject components to identify evidence of loss of material or cracking in susceptible materials or to confirm a lack thereof on the susceptible internal surfaces of the components.

  The sample population will be determined by engineering evaluation based on sound statistical sampling methodology, and, where practical, will be focused on the components most susceptible to aging, such as due to their time in service, the severity of conditions during normal plant operations, and the lowest design margins. The sample population will include at least one location for containment isolation components.

R 9-5

Insert A to Page B-160

In addition, the representative sample will include stainless steel components exposed to temperatures greater than 140 °F and copper alloy> 15% Zn components exposed to raw water that will be examined for evidence of cracking due to SCC.

R 9-6

B.2.42 Open-Cycle Cooling Water Program

Program Description

The Open-Cycle Cooling Water Program manages loss of material due to crevice, galvanic, general, pitting, and MIC, and erosion for components located in the Standby Service Water and Plant Service Water systems, and components connected to or serviced by those systems, and in the Tower Makeup Water and Circulating Water systems. The program also manages fouling due to particulates (e.g., corrosion products) and biological material (micro- and macro-organisms) resulting in reduction in heat transfer for heat exchangers within the scope of the program. ~~In addition, the program manages cracking for copper alloy > 15% Zn components in the Process Sampling System and for aluminum components in the HVAC systems that are subject to condensation.~~

Add: "and"

The Open-Cycle Cooling Water Program consists of inspections, surveillances, and testing to detect the presence, and assess the extent, of ~~fouling, loss of material, and cracking~~, combined with chemical treatments and cleaning activities to minimize fouling, loss of material~~, and cracking~~. The existing program is a combination condition monitoring and mitigation program that implements the recommendations of NRC GL 89-13, "Service Water System Problems Affecting Safety-Related Equipment."

Replace: "fouling and loss of material"

NUREG-1801 Consistency

The Open-Cycle Cooling Water Program is an existing Columbia program that, with enhancement, will be consistent with the 10 elements of an effective aging management program as described in NUREG-1801 Section XI.M20, "Open-Cycle Cooling Water System," with exceptions.

Exceptions to NUREG-1801

Program Elements Affected:

- **Preventive Actions –**

  NUREG-1801 states that system components are lined or coated to protect underlying metal surfaces from being exposed to aggressive cooling water environments. Protective coatings on the inner walls are not used in the service water systems that are within the scope of license renewal at Columbia.

- **Monitoring and Trending –**

  NUREG-1801 states that testing and inspections are performed annually and during refueling outages. Inspection frequencies for the Open-Cycle Cooling Water Program are based on operating conditions and past history; flow rates, water quality, lay-up, and heat exchanger design.

R 10-1

A.1.2.15 CRDRL Nozzle Program

The CRDRL Nozzle Program is an existing mitigation and condition monitoring program that manages cracking due to flaw growth of the control rod drive return line (CRDRL) nozzle, safe end, cap, and connecting welds. The CRDRL Nozzle Program consists of a) mitigation activities, and b) inspection, flaw evaluation, and repair in accordance with the ASME Boiler and Pressure Vessel Code, Section XI, Subsection IWB, Table IWB 2500-1 (2001 Edition through 2003 Addenda) and the recommendations of NUREG-0619. System modifications were implemented by the original equipment manufacturer prior to initial startup to mitigate cracking. The BWR Water Chemistry Program monitors and controls reactor coolant water chemistry in accordance with BWRVIP guidelines to ensure the long-term integrity and safe operation of the critical regions of the CRDRL nozzle.

The CRDRL Nozzle Program credits portions of the Inservice Inspection (ISI) Program.

A.1.2.16 Diesel Starting Air Inspection

The Diesel Starting Air Inspection detects and characterizes the condition of materials for the DSA System air dryers and downstream piping and components (excluding the DSA System air receivers). The inspection provides direct evidence as to whether, and to what extent, a loss of material due to corrosion has occurred.

The Diesel Starting Air Inspection is a new one-time inspection that will be implemented prior to the period of extended operation. The inspection activities will be conducted within the 10-year period prior to the period of extended operation.

A.1.2.17 Diesel Systems Inspection

The Diesel Systems Inspection detects and characterizes the condition of materials for the interior of the exhaust piping for the Division 1, 2, and 3 diesels in the Diesel Engine Exhaust System, including the loop seal drains from the exhaust piping~~, and the drain pans and drain piping associated with air-handling units of the Diesel Building HVAC systems~~. The inspection provides direct evidence as to whether, and to what extent, a loss of material due to corrosion has occurred.

The Diesel Systems Inspection is a new one-time inspection that will be implemented prior to the period of extended operation. The inspection activities will be conducted within the 10-year period prior to the period of extended operation.

A.1.2.18 Diesel-Driven Fire Pumps Inspection

The Diesel-Driven Fire Pumps Inspection detects and characterizes the material condition of the interior of the Fire Protection System diesel engine exhaust piping, and of Fire Protection System diesel heat exchangers exposed to a raw water environment.

R 10-2

Table A-1
Columbia License Renewal Commitments

Item Number	Commitment	FSAR Supplement Location (LRA App. A)	Enhancement or Implementation Schedule
16) Diesel Starting Air Inspection	The Diesel Starting Air Inspection is a new activity. The Diesel Starting Air Inspection detects and characterizes the condition of materials for the DSA System air dryers and downstream piping and components (excluding the DSA System air receivers). The inspection provides direct evidence as to whether, and to what extent, the relevant effects of aging have occurred.	A.1.2.16	Within the 10-year period prior to the period of extended operation.
17) Diesel Systems Inspection	The Diesel Systems Inspection is a new activity. The Diesel Systems Inspection detects and characterizes the condition of materials for the interior of the exhaust piping for the Division 1, 2, and 3 diesels in the Diesel Engine Exhaust System, including the loop seal drains from the exhaust piping~~, and the drain pans and drain piping associated with air handling units of the Diesel Building HVAC systems~~. The inspection provides direct evidence as to whether, and to what extent, the relevant effects of aging have occurred.	A.1.2.17	Within the 10-year period prior to the period of extended operation.
18) Diesel-Driven Fire Pumps Inspection	The Diesel-Driven Fire Pumps Inspection is a new activity. The Diesel-Driven Fire Pumps Inspection detects and characterizes the material condition of the interior of the Fire Protection System diesel engine exhaust piping, and of Fire Protection System diesel heat exchangers exposed to a raw water environment. The inspection provides direct evidence as to whether, and to what extent, the relevant effects of aging have occurred.	A.1.2.18	Within the 10-year period prior to the period of extended operation.

Amendment 1

R 10-3

B.2.17 Diesel Systems Inspection

Program Description

The Diesel Systems Inspection is a new one-time inspection that will detect and characterize the material condition of the interior of the exhaust piping for the Division 1, 2, and 3 diesels in the Diesel Engine Exhaust System, including the loop seal drains from the exhaust piping~~, and the drain pans and drain piping associated with air-handling units of the Diesel Building HVAC systems~~. The inspection provides direct evidence as to whether, and to what extent, a loss of material due to corrosion has occurred or is likely to occur.

Implementation of the Diesel Systems Inspection will provide confirmation that the integrity of the subject components will be maintained consistent with the current licensing basis during the period of extended operation.

NUREG-1801 Consistency

The Diesel Systems Inspection is a new one-time inspection for Columbia that will be consistent with the 10 elements of an effective aging management program as described in NUREG-1801, Section XI.M32, "One-Time Inspection."

Exceptions to NUREG-1801

None.

Aging Management Program Elements

The results of an evaluation of each program element are provided below.

- Scope of Program
  The scope of the Diesel Systems Inspection includes the steel exhaust piping exposed to an air-outdoor environment, and the loop seal drains from the exhaust piping that are exposed to a raw water environment, for the following diesel engines:

  - DG-ENG-1A1/1A2
  - DG-ENG-1B1/1B2
  - DG-ENG-1C
  - DSA-ENG-C/2C

  ~~Additionally the stainless steel drain pans and steel drain piping exposed to a raw water environment and associated with the following equipment are in the scope of the Diesel Systems Inspection:~~

R 10-4

- ~~DMA-AH-11, 12, 21, 22, 31, 32, and 51 (air-handling unit housings)~~

- Preventive Actions
  No actions are taken as part of the Diesel Systems Inspection to prevent aging effects or to mitigate aging degradation.

- Parameters Monitored or Inspected
  The parameters to be inspected by the Diesel Systems Inspection include wall thickness or visual evidence of internal surface degradation~~,~~ of the diesel exhaust piping ~~and the drain pans and drain piping~~ as measures of loss of material. Inspections will be performed by qualified personnel using established NDE techniques (i.e., ultrasonic examination). Visual inspection of the internals for evidence of corrosion and corrosion products may be performed as opportunities for access arise.

- Detection of Aging Effects
  The Diesel Systems Inspection will use a combination of established volumetric and visual examination techniques (such as equivalent to VT-1 or VT-3) performed by qualified personnel on a representative sample of the subject components to identify evidence of loss of material.

  The sample population will be determined by engineering evaluation based on sound statistical sampling methodology, and, where practical, will be focused on the components most susceptible to aging, such as due to their time in service, the severity of conditions during normal plant operations, and design margins.

  The Diesel Systems Inspection will be conducted after the issuance of the renewed license and prior to the end of the current operating license, with sufficient time to implement programmatic oversight for the period of extended operation. The activities will be conducted no earlier than 10 years prior to the end of the current operating license, so that conditions are more representative of the conditions expected during the period of extended operation.

- Monitoring and Trending
  This one-time inspection activity is used to characterize conditions and to determine if, and to what extent, further actions may be required. The activity includes provisions for increasing the inspection sample size and locations if degradation is detected.

  The sample size will be determined by engineering evaluation of the materials of construction, the environment (i.e., service conditions), aging effects, and operating experience (e.g., time in-service, susceptible locations, lowest design margins). Inspection findings that do not meet the acceptance criteria will be evaluated using

R 11-1

A.1.2.37 Lubricating Oil Inspection

The Lubricating Oil Inspection detects and characterizes the condition of materials in systems and components for which the Lubricating Oil Analysis Program is credited with aging management. The inspection provides direct evidence as to whether, and to what extent, a loss of material due to corrosion or selective leaching has occurred. The inspection also determines whether a reduction in heat transfer due to fouling has occurred.

The Lubricating Oil Inspection is a new one-time inspection that will be implemented prior to the period of extended operation. The inspection activities will be conducted within the 10-year period prior to the period of extended operation.

A.1.2.38 Masonry Wall Inspection

The Masonry Wall Inspection consists of inspection activities to detect cracking of masonry walls within the scope of license renewal. Masonry walls that perform a fire barrier intended function are also managed by the Fire Protection Program. The Masonry Wall Inspection is implemented as part of the Structures Monitoring Program. The Masonry Wall Inspection performs visual inspection of external surfaces of masonry walls.

The Masonry Wall Inspection is an existing program that requires enhancement prior to the period of extended operation.

A.1.2.39 Material Handling System Inspection Program

The Material Handling System Inspection Program manages loss of material for cranes (including bridge, trolley, rails, and girders), monorails, and hoists within the scope of license renewal. The Material Handling System Inspection Program is based on guidance contained in ANSI B30.2 for overhead and gantry cranes, ANSI B30.11 for monorail systems and underhung cranes, and ANSI B30.16 for overhead hoists.

~~The Material Handling System Inspection Program is an existing program that requires enhancement prior to the period of extended operation.~~

A.1.2.40 Metal-Enclosed Bus Program

The Metal-Enclosed Bus Program is an inspection program that detects degradation of metal-enclosed bus within the scope of license renewal. The program provides for the visual inspection of interior sections of bus, and an inspection of the elastomeric seals at the joints of the duct sections. The program also makes provision for thermographic inspection of bus bolted connections.

Amendment 1

R 11-2

Table A-1
Columbia License Renewal Commitments

Item Number	Commitment	FSAR Supplement Location (LRA App. A)	Enhancement or Implementation Schedule
38) Masonry Wall Inspection	The Masonry Wall Inspection is an existing program that will be continued for the period of extended operation, with the following enhancements: • Specify that for each masonry wall, the extent of observed masonry cracking or degradation of steel edge supports and bracing are evaluated to ensure that the current evaluation basis is still valid. Corrective action is required if the extent of masonry cracking or steel degradation is sufficient to invalidate the evaluation basis. An option is to develop a new evaluation basis that accounts for the degraded condition of the wall (i.e., acceptance by further evaluation).	A.1.2.38	Enhancement prior to the period of extended operation. Then ~~going~~. ongoing
39) Material Handling System Inspection Program	The Material Handling System Inspection Program is an existing program that will be continued for the period of extended operation. ~~with the following enhancement:~~ ~~• Ensure jib cranes and electrically operated hoists are visually inspected for corrosion.~~	A.1.2.39	~~Enhancement prior to the period of extended operation.~~ ~~Then~~ ongoing.

Amendment 1

Table B-2
Consistency of Columbia Aging Management Programs with NUREG-1801 (continued)

Program Name	New / Existing	Consistent with NUREG-1801	Consistent with NUREG-1801 with Exceptions	Plant-Specific	Enhancement Required
Inservice Inspection (ISI) Program – IWF Section B.2.35	Existing	Yes	--	--	--
Lubricating Oil Analysis Program Section B.2.36	Existing	Yes	--	--	Yes
Lubricating Oil Inspection Section B.2.37	New	Yes	--	--	--
Masonry Wall Inspection Section B.2.38	Existing	Yes	--	--	Yes
Material Handling System Inspection Program Section B.2.39	Existing	Yes	--	--	~~Yes~~
Metal-Enclosed Bus Program Section B.2.40	New	--	Yes	--	--
Monitoring and Collection Systems Inspection Section B.2.41	New	Yes	--	--	--
Open-Cycle Cooling Water Program Section B.2.42	Existing	--	Yes	--	Yes
Potable Water Monitoring Program Section B.2.43	Existing	--	--	Yes	Yes

Amendment 1

R 11-4

B.2.39 Material Handling System Inspection Program

Program Description

The Material Handling System Inspection Program is credited with managing loss of material for cranes (including bridge, trolley, rails, and girders), monorails, and hoists within the scope of license renewal. The Material Handling System Inspection Program is based on guidance contained in ANSI B30.2 for overhead and gantry cranes, ANSI B30.11 for monorail systems and underhung cranes, and ANSI B30.16 for overhead hoists. The inspections monitor structural members for signs of corrosion and wear. The inspections are performed periodically for installed cranes and hoists (e.g., annually for the reactor building crane, other NUREG-0612 heavy load handling systems and the refueling platform).

The Material Handling System Inspection Program provides reasonable assurance that the effects of aging are adequately managed for Columbia cranes (including bridge, trolley, rails, and girders), monorails, and hoists and that their intended function will continue to be performed consistent with the current licensing basis for the period of extended operation.

NUREG-1801 Consistency

Replace stricken text with "is"

The Material Handling System Inspection Program is an existing Columbia program that~~, with enhancement, will be~~ consistent with the 10 elements of an effective aging management program as described in NUREG-1801, Section XI.M23, "Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems."

Exceptions to NUREG-1801

None.

Required Enhancements

Replace stricken text with "None."

~~Prior to the period of extended operation the enhancement listed below will be implemented in the identified program element:~~

- ~~**Detection of Aging Effects** –~~

  ~~Ensure jib cranes and electrically operated hoists are visually inspected for corrosion.~~

Operating Experience

A review of crane and hoist inspections previously conducted at Columbia and of industry operating experience confirms the acceptability of the inspections and their

Amendment 1

R 11-5

frequency in that degradation of cranes (including bridge, trolley, rails, and girders), monorails, and hoists was detected prior to loss of function. Related crane and hoist inspections have found no age-related degradation problems.

The health of the Material Handling System Inspection Program is reported periodically in terms of performance indicators. The program health reports for 2007 ~~and 2008~~ noted no age-related improvements for the program.

The Material Handling System Inspection Program has been effective in managing the identified aging effects. The site corrective action program and ongoing review of industry operating experience will be used to ensure that the program continues to be effective in managing the identified aging effects.

replace with
"to 2009"

Conclusion

The Material Handling System Inspection Program will be capable of detecting and managing loss of material for cranes (including bridge, trolley, rails, and girders), monorails, and hoists within the scope of license renewal. The continued implementation of the Material Handling System Inspection Program~~, with the required enhancement,~~ provides reasonable assurance that the aging effects will be managed such that components subject to aging management review will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

Amendment 1

R 12

2.4.4 Circulating Water Pump House – Seismic Category II

Structure Description

The Circulating Water Pump House (aka Circulation Water Pump House) houses the electric and diesel driven fire water pumps, and three circulating water pumps. The Circulating Water Pump House has a reinforced concrete floor, insulated metal wall panels, and a metal roof deck over structural steel framing. The Circulating Water Pump House and the chlorination sections of the building are separated by a masonry wall. The diesel fire pump fuel storage tank room is isolated by ~~3-hour~~ fire rated masonry walls. Replace: "2-hour"

The portion of the structure containing chlorination systems does not contain any equipment within the scope of license renewal.

Remote buildings credited in the fire protection program (Service Water Pump House 1 and 2, Circulating Water Pump House, Water Filtration Building) with non-rated barriers are sufficiently separated from each other and from the plant that a single exposure fire would not spread to more than one building.

The circulating water basin is addressed with Yard Structures (Section 2.4.12).

Reason for Scope Determination

The Circulating Water Pump House is relied upon to demonstrate compliance with the Fire Protection (10 CFR 50.48) regulated event and meets the 10 CFR 54.4(a)(3) scoping criteria. The Circulating Water Pump House provides physical support and protection to the fire water pumps, which are relied upon to demonstrate compliance with Fire Protection regulated event.

In addition, the Circulating Water Pump House is in the scope of license renewal because it contains:

- Structural components that are relied on during postulated fire event.

FSAR References

Section 10.4.5.2 and Appendix F of the FSAR describe the Circulating Water Pump House.

Components Subject to AMR

Table 2.4-4 lists the component types that require AMR and their intended functions.

The structural commodities for the Circulating Water Pump House are addressed in the bulk commodities evaluation in Section 2.4.13.

Amendment 1

R 13

2.3.2.3 High-Pressure Core Spray (HPCS) System

System Description

The HPCS System consists of a motor-driven centrifugal pump, a spray sparger in the reactor vessel located above the core (separate from the LPCS sparger), and associated system piping, valves, controls, and instrumentation. The HPCS System is designed to pump water into the reactor vessel over a wide range of vessel pressures. For small breaks that do not result in rapid depressurization, the system maintains reactor water level. For large breaks, the HPCS System cools the reactor core by spray. The HPCS System also provides for core cooling in the event of a station blackout. Suction piping is provided from the condensate storage tank and also from the suppression pool. The elevation of the HPCS pump is sufficiently below the water level of both the condensate storage tanks and the suppression pool to provide a flooded pump suction and to meet pump net positive suction head (NPSH) requirements with the containment at atmospheric pressure and post-accident debris entrained on the beds of the suction strainers.

The HPCS discharge line fill system is designed to maintain the pump discharge line in a filled condition to ensure the time between the signal to start the pump and the initiation of flow into the reactor vessel is minimized. To ensure that any leakage from the discharge line is replaced and the line is always kept full, a water leg pump system is provided.

Replace paragraph with Insert A shown on page 2.3-24a

Reason for Scope Determination

~~The HPCS System provides RPV spray cooling during a large-break LOCA that uncovers the core, maintains RPV water level during a small-break LOCA that does not depressurize the reactor vessel, provides Primary Containment isolation and integrity (including valve position indication), and maintains the reactor coolant pressure boundary integrity. All of these system-intended functions are safety-related. Therefore, the HPCS System meets the scoping criteria of 10 CFR 54.4(a)(1).~~

The HPCS System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The HPCS System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the HPCS System meets the scoping criteria of 10 CFR 54.4(a)(2).

The HPCS System is also relied upon to demonstrate compliance with, and meets the 10 CFR 54.4(a)(3) scoping criteria for, the Environmental Qualification (10 CFR 50.49), Anticipated Transients Without Scram (10 CFR 50.62), and Station Blackout (10 CFR 50.63) regulated events.

Amendment 1

Insert A for LRA Page 2.3-24

The HPCS System provides RPV spray cooling during a large-break LOCA that uncovers the core, maintains RPV water level during a small-break LOCA that does not depressurize the reactor vessel, provides Primary Containment isolation and integrity (including valve position indication), provides Secondary Containment isolation and integrity (including valve position indication), and maintains the reactor coolant pressure boundary integrity. All of these system-intended functions are safety-related. Therefore, the HPCS System meets the scoping criteria of 10 CFR 54.4(a)(1).

R 14

2.3.3.18 Diesel Fuel Oil (DO) System

System Description

The DO System consists of separate, independent diesel oil supply systems serving each of the diesel generators. Each of these systems consists of a fuel oil storage tank, a transfer pump, a day tank, interconnecting piping and valves, and associated instruments and controls.

The auxiliary boiler fuel oil storage tank (FO-TK-1) is used as an additional storage tank for the emergency diesel generator fuel oil storage and transfer system. This tank is maintained to the same cleanliness requirements as the other Class I fuel oil tanks. The diesel fuel oil stored in this tank is surveyed to the same requirements as the fuel oil in the other diesel storage tanks.

Replace paragraph with Insert A shown on page 2.3-80a

~~The fuel oil supply from the day tanks to each diesel engine consists of two mutually redundant systems. Either system is capable of supplying fuel oil to the engine. Each system contains a fuel oil supply line strainer, fuel oil pump, duplex filter, pressure gauge, and relief and check valves.~~

One of the fuel oil supply pumps is mechanically driven by the engine and is normally used during engine operation. The other supply pump is driven by a 120-V DC motor and is used to fill the fuel oil system and fuel header prior to initial operation and after maintenance has been performed on system piping and components. The DC-motor-driven pump runs during engine operation in the event fuel supply through the engine-driven pump system fails.

Add new paragraph from Insert B shown on page 2.3-80a

Reason for Scope Determination

The DO System provides fuel oil to enable the emergency diesel generators to start, run, and load. This system-intended function is safety-related. Therefore, the DO System meets the scoping criteria of 10 CFR 54.4(a)(1).

The DO System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The DO System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the DO System meets the scoping criteria of 10 CFR 54.4(a)(2).

The DO System is relied upon to demonstrate compliance with, and meets the 10 CFR 54.4(a)(3) scoping criteria for, the Fire Protection (10 CFR 50.48), Anticipated Transients Without Scram (10 CFR 50.62), and Station Blackout (10 CFR 50.63) regulated events.

R 14

Insert A for LRA Page 2.3-80

The fuel oil supply from the day tanks to each diesel engine consists of two systems. Either system is capable of supplying fuel oil to the engine. For diesel generator sets 1 and 2, each system contains a fuel supply line strainer, fuel oil pump, duplex filter, pressure gauge, relief and check valves, and separate fuel return lines to the day tanks.

Insert B for LRA Page 2.3-80

For the HPCS diesel generator, there are two fuel oil systems external to the engine fuel manifolds, either of which is capable of supplying fuel oil to the engine. One of the fuel oil pumps is mechanically driven by the engine and the other by a 120-V DC motor. The systems contain the following components from the day tank: fuel supply lines, strainers, fuel oil pumps, duplex filters, and relief and check valves. The two systems join together at the manifold for the duplex filter of the engine-driven fuel oil pump and share that duplex filter, a pressure gage, fuel lines and manifolds to the injectors, injectors, and a return line to the day tank.

R- 15

Replace this page in its entirety with page 4.3-4a

[f] Columbia is analyzed for 120 startups and shutdowns. The 120 startups consist of 117 normal startups and 3 natural circulation startups. The 120 shutdowns consist of 111 normal shutdowns, 8 single safety or relief valve blowdowns, and 1 rapid depressurization with delayed trip.

Table 4.3-2
Actual Cycles and Projected Cycles

Conditions	Analyzed cycles	Actual cycles 12/13/1984 through 7/31/2007	60 year (12/13/2044) projection[(3)]	Cycles for future analyses[(4)]
Boltup/Unbolt	123	21	55	60
Reactor Startup (100 degF/hr)	120	88	233	250
Reactor Shutdown (100 degF/hr)	111	87	230	242
Vessel Pressure Tests	130	2[(1, 2)]	2[(1)]	60
Loss of Feedwater Heaters	80	0	0	80
Scram - Loss of feedwater pumps, isolation valves closed	10	7	18	20
Scram - Single safety relief valve blowdown	8	0	0	8
Scram - TG trip, FW on, isolation valves open	40	22	58	60
Scram - Other	140	34	90	90
LPCS operation	10	0	0	10
HPCS operation	10	4	10	10[4]
LPCI operation	10	0	0	10
SLC operation	10	0	0	10

(1) Vessel hydrostatic pressure tests are no longer performed. Vessel operational leak tests have replaced the hydrostatic pressure tests.
(2) These two pressure tests were hydrostatic pressure tests.
(3) Projections were not changed for those events that have not occurred.
(4) The 20 Scrams with Loss of Feedwater assume 3 HPCS injections per scram. The HPCS initiation assumes 10 additional injections without a scram. The HPCS nozzle is analyzed for 70 cycles combined from the two events.

Amendment 1

R-15

f Columbia is analyzed for 120 startups and shutdowns. The 120 startups consist of 117 normal startups and 3 natural circulation startups. The 120 shutdowns consist of 111 normal shutdowns, 8 single safety or relief valve blowdowns, and 1 rapid depressurization with delayed trip.

Table 4.3-2
Actual Cycles and Projected Cycles

Conditions	Analyzed cycles	Actual cycles 12/13/1984 through 2/16/2010	60 year (12/13/2044) projection(1)	Cycles for future analyses
Boltup/Unbolt	123	23	54	60
Reactor Startup (100 degF/hr)	120	94	224	250
Reactor Shutdown (100 degF/hr)	111	93	221	250
Vessel Pressure Tests	130	23	54	65
Loss of Feedwater Heaters	80	0	0	80
Scram – Loss of feedwater pumps, isolation valves closed	10	7	16	20
Scram – Single safety relief valve blowdown	8	1	2	8
Scram – TG trip, FW on, isolation valves open	40	23	54	60
Scram – HPCS Injection	30	12	28	60(2)
Scram – Other	140	39	92	90
LPCS operation	10	0	0	10
HPCS operation	10	3	7	10(2)
LPCI operation	10	0	0	10
SLC operation	10	0	0	10

(1) Projections were not changed for those events that have not occurred.
(2) Total HPCS injection cycles from scrams (60) and non-scrams (10) should not exceed 70.

R 45-1

The Carbon Dioxide and Dry Chemical Fire Suppression systems do not contain components that perform a license renewal intended function, and therefore are not within the scope of license renewal.

The diesel fuel oil lines that supply fuel oil to the fire protection pump diesels, designated as DO on the drawings, and the fire protection pump diesel engine exhaust piping, designated as DE on the drawings, are within the evaluation boundaries of the Fire Protection System.

Components Subject to AMR

Table 2.3.3-22 lists the component types that require AMR and their intended functions.

Table 3.3.2-22, Aging Management Review Results – Fire Protection System, provides the results of the AMR.

Portable fire extinguishers are within the scope of license renewal. However, they are periodically inspected and hydrostatically tested, and are replaced if they do not pass an inspection or test. Portable fire extinguishers are short-lived components, subject to replacement based on a qualified life or specified time period, and not subject to AMR.

Fire and smoke detectors, and alarm devices, do not perform a passive mechanical function for the purpose of license renewal. Electrical components that are subject to AMR (the cables for the detectors and alarms) are addressed in Section 2.5.

Fire barriers, fire dampers, fire doors, and fire penetration seals determined to be within the scope of license renewal and subject to AMR are addressed as structural commodities in Section 2.4.13.

Fire hoses are within the scope of license renewal. However, they are periodically inspected to ensure that they are in an acceptable operating condition. These ongoing hose station inspections (together with the associated action to repair or replace any fire hose noted to be in a deteriorated condition) establish a qualified life for the hoses. Therefore, the fire hoses are not subject to AMR.

The pre-action sprinkler systems are connected to the Control Air System. A failure of the air system will place the sprinkler system in a safe position. That is, the fusible link closed sprinkler heads will maintain water inventory in the piping and the sprinkler system will still be able to perform its system-intended function. Therefore, since this portion of the Control Air System, and associated components, does not have any other component intended function, the portion of the air system included within the Fire Protection System boundary is not subject to AMR.

Insert: "fire pump"

The diesel engines, except for the attached heat exchanger, are evaluated as active components and not subject to AMR.

R 45-2

~~The jockey pumps are not essential fire protection equipment per Columbia Licensee Controlled Specifications (LCS) 1.10.1. Therefore, since the jockey pumps do not have a component intended function, they are not subject to AMR.~~

Halon cylinders are within the scope of license renewal. The principal design criterion for these bottles is Department of Transportation Standards. The halon cylinders comply with the requirements of the DOT standards. The halon cylinders are consumables, replaced periodically in accordance with DOT standards, and are not subject to AMR.

The Fire Protection bladder tank (FP-TK-110) is within the scope of license renewal. However, it has a service life of approximately 20 years and was replaced accordingly in 2008. The replacement tank is of a similar design, with the same limited service life, and is subject to inspections to ensure its timely replacement. The bladder tank is short-lived, subject to replacement based on a qualified life or specified time period, and is not subject to AMR.

R 45-3

Table 2.3.3-22
Fire Protection System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Bolting	Pressure Boundary Structural Integrity
Exhaust silencer	Pressure Boundary
Flexible connection	Pressure Boundary
Heat exchanger (shell)	Pressure Boundary
Heat exchanger (tubes)	Heat Transfer Pressure Boundary
Hydrant	Pressure Boundary
Orifice	Pressure Boundary Throttling
Piping	Pressure Boundary Structural Integrity
Pump casing	Pressure Boundary
Spray nozzle	Pressure Boundary Spray
Sight glass	Pressure Boundary
~~Strainer (body and screen)~~	~~Filtration~~ ~~Pressure Boundary~~
Tank	Pressure Boundary
Tubing	Pressure Boundary Structural Integrity
Valve body	Pressure Boundary Structural Integrity

Replace this table row with "Insert A" from page 2.3-97a

R 45-3

Insert A for LRA Page 2.3-97

Strainer (body)	Pressure boundary
Strainer (screen)	Filtration

R 46-1

Table 3.3.2-22 Aging Management Review Results –Fire Protection System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
113	Pump Casing (Lube Oil)	Pressure boundary	Gray Cast Iron	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
114	Sight Glass	Pressure boundary	Glass	Air-indoor uncontrolled (Internal)	None	None	VII.J-8	3.3.1-93	A 0306
115	Sight Glass	Pressure boundary	Glass	Raw water (Internal)	None	None	VII.J-11	3.3.1-93	A
116	Sight Glass	Pressure boundary	Glass	Air-indoor uncontrolled (External)	None	None	VII.J-8	3.3.1-93	A
117	Sight Glass	Pressure boundary	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	C 0302
118	Sight Glass	Pressure boundary	Steel	Raw water (Internal)	Loss of material	Fire Water	VII.G-24	3.3.1-68	A
119	Sight Glass	Pressure boundary	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
120	Spray Nozzle	Pressure boundary	Copper Alloy > 15% Zn	Air-indoor uncontrolled (Internal)	None	~~None~~ Insert: "Fire Water"	N/A	N/A	G Insert: "0327"

Table 3.3.2-22 Aging Management Review Results –Fire Protection System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
121	Spray Nozzle	Pressure boundary	Copper Alloy > 15% Zn	Raw water (Internal)	Cracking	Fire Water	N/A	N/A	H 0318
122	Spray Nozzle	Pressure boundary	Copper Alloy > 15% Zn	Raw water (Internal)	Loss of material	Fire Water	VII.G-12	3.3.1-70	A 0317
123	Spray Nozzle	Pressure boundary	Copper Alloy > 15% Zn	Air-indoor uncontrolled (External)	None	~~None~~	N/A	N/A	G
124	Spray Nozzle	Spray	Copper Alloy > 15% Zn	Air-indoor uncontrolled (Internal)	None	~~None~~	N/A	N/A	G
125	Spray Nozzle	Spray	Copper Alloy > 15% Zn	Raw water (Internal)	Cracking	Fire Water	N/A	N/A	H 0318
126	Spray Nozzle	Spray	Copper Alloy > 15% Zn	Raw water (Internal)	Loss of material	Fire Water	VII.G-12	3.3.1-70	A 0317
127	Spray Nozzle	Spray	Copper Alloy > 15% Zn	Air-indoor uncontrolled (External)	None	~~None~~	N/A	N/A	G
128	Strainer (body)	Pressure boundary	Copper Alloy	Air-indoor uncontrolled (Internal)	None	None	N/A	N/A	G

Insert: "0327"

Insert: "Fire Water"

R 46-3

Plant-Specific Notes:	
0315	The BWR Water Chemistry Program and Chemistry Program Effectiveness Inspection will manage loss of material of components submerged in the suppression pool and subject to a treated water environment.
0316	The fire protection diesel engine coolant (antifreeze) is evaluated as Raw Water.
0317	The Fire Water Program also manages loss of material due to selective leaching of fire sprinkler system spray nozzles that are normally exposed to a raw water (internal) environment. The copper alloy spray nozzles are inspected or replaced in accordance with the Fire Water Program; the inspection includes detection of selective leaching.
0318	For conservatism, it is assumed that ammonia or ammonium compounds are present in the raw water environment as a by-product of organic decay, as a by-product of MIC, or possibly from fertilizers.
0319	Subject component is exposed to reactor closed cooling (RCC) water.
0320	Subject component has an air-water interface that constitutes an agressive environment.
0321	Subject component is exposed to plant service water (TSW).
0322	Environment is predominantly outdoor air with infrequent, and for short duration, exposure to diesel exhaust.
0323	The internal environment between the outer and inner vessels of CN-TK-1 is conservatively evaluated as air instead of as a vacuum. Since the external surface is exposed to the more aggressive outdoor air environment, aging effects will occur on the external surface before they occur on the internal surface.
0324	The aging effect determination for the Air-outdoor (Internal) environment is the same as the NUREG-1801 determination for an Air-outdoor (External) environment because the material is the same and the internal environment is equivalent to the external environment evaluated in the NUREG-1801 item. Monitoring of the external surface condition will be used to characterize the aging effects on the internal surfaces.

Insert A shown on page 3.3-400a

Insert A to LRA Page 3.3-400

0325	The material is not aluminum alloy > 12% Zinc or 6% Magnesium, which is required for the mechanism of cracking due to stress corrosion cracking to be applicable.
0326	Based on a review of recent operating experience, the bottom portion of the air-handling unit housings for WMA-AH-51A/B are evaluated as exposed to an internal environment of condensation.
0327	No aging effects requiring management have been identified. However, for all brass (copper alloy > 15% Zn) spray nozzles that are in the scope of license renewal, the Fire Water Program is credited to provide confirmation of the absence of significant aging effects during the period of extended operation.

Summary of Walkdown Results Changes

Change Number	Summary	Changed or New Page Numbers
21	Reference to new boundary drawing LR-M532 has been added to reflect the additional portions of the Control Air System (CAS) added to the scope of license renewal. Portions of the CAS are located in plant areas containing safety-related systems, structures, and components (SSCs) and are included in accordance with the non-safety affecting safety (NSAS) scoping criteria (10 CFR 54.4(a)(2)). No new material and environment combinations have been introduced, no new aging effects have been identified, and no new aging management programs are required.	2.3-57
22	New components (tanks), material (stainless steel), environment (moist air), aging effect requiring management (cracking), and an additional aging management program (Supplement Piping / Tank Inspection) have been added to the LRA for the Condensate (Auxiliary) (CO). Portions of the CO System are located in plant areas containing safety-related SSCs and are included in accordance with the NSAS scoping criteria (10 CFR 54.4(a)(2)). Reference to new boundary drawings LR-M513 and LR-M514 has been added to reflect the additional portions of the CO added to the scope of license renewal	2.3-166 2.3-167 2.3-167a 3.4-3 3.4-14 3.4-14a 3.4-43 3.4-43a B-197
23	Increased the scope of the Condensate (Nuclear) (COND) System as shown on new or revised boundary drawings LR-M527-2, LR-M532, and LR-M534. A new component type (flexible connections) has been added to the scope of the COND System. Portions of the COND System are located in plant areas containing safety-related SSCs and are included in accordance with the NSAS scoping criteria (10 CFR 54.4(a)(2)). No new aging management programs are required to manage the aging effects of the additional component type.	2.3-169 2.3-170 2.3-170a 3.4-53 3.4-53a

Summary of Walkdown Results Changes		
Change Number	**Summary**	**Changed or New Page Numbers**
24	Reference to new boundary drawing LR-M536 has been added to reflect the additional portions of the Condensate Processing Radioactive (CPR) added to the scope of license renewal. Portions of the CPR are located in plant areas containing safety-related SSCs and are included in accordance with the NSAS scoping criteria (10 CFR 54.4(a)(2)). No new material and environment combinations have been introduced, no new aging effects have been identified, and no new aging management programs are required.	2.3-38
25	Reference to new boundary drawing LR-M531 has been added to reflect the additional portions of the Floor Drain (FD) System added to the scope of license renewal. Portions of the FD are located in plant areas containing safety-related SSCs and are included in accordance with the NSAS scoping criteria (10 CFR 54.4(a)(2)). No new material and environment combinations have been introduced, no new aging effects have been identified, and no new aging management programs are required.	2.3-98
26	Added new components (tanks and pump casing) to the scope of the Equipment Drains Radioactive (EDR) System as shown on new LR-M532. A new environment (moist air) was also identified. Portions of the EDR are located in plant areas containing safety-related SSCs and are included in accordance with the NSAS scoping criteria (10 CFR 54.4(a)(2)). No new material and environment combinations have been introduced, no new aging effects have been identified, and no new aging management programs are required.	2.3-90 2.3-91 2.3-91a 3.3-25 3.3-104 3.3-232 3.3-232a
27	Added new components (tank and pump casing) to the scope of the Floor Drains Radioactive (FDR) System as shown on new LR-M531. A new environment (moist air) was also identified. Portions of the FDR are located in plant areas containing safety-related SSCs and are included in accordance with the NSAS scoping criteria (10 CFR 54.4(a)(2)). No new material and environment combinations have been introduced, no new aging effects have been identified, and no new aging management programs are required	2.3-101 2.3-102 2.3-102a 3.3-29 3.3-2633.3- 263a

Summary of Walkdown Results Changes

Change Number	Summary	Changed or New Page Numbers
28	Added the Heating Steam (HS) System to the scope of license renewal. Portions of the HS System are located in plant areas containing safety-related SSCs and are included in accordance with the NSAS scoping criteria (10 CFR 54.4(a)(2)). No new material and environment combinations have been introduced, no new aging effects have been identified, and no new aging management programs are required.	2.2-4 2.3-35 2.3-162 2.3-162a 2.3-162b 3.3-2 3.3-2a 3.3-5 3.3-5a 3.3-50 3.3-50a 3.3-50b 3.3-55 3.3-55a 3.3-115 3.3-397 3.3-397a 3.3-397b 3.3-397c 3.3-397d 3.3-397e 3.3-397f 3.3-397g B-179

Summary of Walkdown Results Changes

Change Number	Summary	Changed or New Page Numbers
29	Added the Heating Steam Condensate (HCO) System to the scope of license renewal. Portions of the HCO System are located in plant areas containing safety-related SSCs and are included in accordance with the NSAS scoping criteria (10 CFR 54.4(a)(2)). No new material and environment combinations have been introduced, no new aging effects have been identified, and no new aging management programs are required.	2.2-4 2.3-35 2.3-162 2.3-162c 2.3-162d 3.3-2 3.3-2a 3.3-5 3.3-5a 3.3-50 3.3-50b 3.3-50c 3.3-55 3.3-55a 3.3-77 3.3-77a 3.3-101 3.3-101a 3.3-113 3.3-397 3.3-397h 3.3-397i 3.3-397j 3.3-397k 3.3-397l 3.3-397m B-179 B-198

Summary of Walkdown Results Changes

Change Number	Summary	Changed or New Page Numbers
30	Added the Heating Steam Vent (HSV) System to the scope of license renewal. Portions of the HSV System are located in plant areas containing safety-related SSCs and are included in accordance with the NSAS scoping criteria (10 CFR 54.4(a)(2)). No new material and environment combinations have been introduced, no new aging effects have been identified, and no new aging management programs are required.	2.2-4 2.3-35 2.3-162 2.3-162e 2.3-162f 3.3-2 3.3-2a 3.3-5 3.3-5a 3.3-50 3.3-50c 3.3-50d 3.3-55 3.3-55a 3.3-397 3.3-397n
31	Reference to new boundary drawings LR-M531, LR-M533-1, and LR-M533-2 has been added to reflect the additional portions of the Miscellaneous Waste Radioactive (MWR) System added to the scope of license renewal. Portions of the MWR System are located in plant areas containing safety-related SSCs and are included in accordance with the NSAS scoping criteria (10 CFR 54.4(a)(2)). No new material and environment combinations have been introduced, no new aging effects have been identified, and no new aging management programs are required.	2.3-108
32	Added new component (tubing) and location (radwaste building and corridors) for portions of the Potable Hot Water (PWH) System added to the scope of license renewal. Portions of the PWH System are located plant areas containing safety-related SSCs and are included in accordance with the NSAS scoping criteria (10 CFR 54.4(a)(2)). No new material and environment combinations have been introduced, no new aging effects have been identified, and no new aging management programs are required.	2.3-117 2.3-117a 3.3-291 3.3-291a B-167

Summary of Walkdown Results Changes

Change Number	Summary	Changed or New Page Numbers
33	Revised drawing LR-M525-2 to reflect the additional portions of the Reactor Building Closed Cooling Water (RCC) System added to the scope of license renewal. Portions of the RCC System are located in plant areas containing safety-related SSCs and are included in accordance with the NSAS scoping criteria (10 CFR 54.4(a)(2)). No new material and environment combinations have been introduced, no new aging effects have been identified, and no new aging management programs are required.	2.3-141 No page change, drawing revised
34	Reference to new boundary drawing LR-M536 has been added to reflect the additional portions of the Reactor Water Cleanup (RWCU) System added to the scope of license renewal. Portions of the RWCU System are located plant areas containing safety-related SSCs and are included in accordance with the NSAS scoping criteria (10 CFR 54.4(a)(2)). No new material and environment combinations have been introduced, no new aging effects have been identified, and no new aging management programs are required.	2.3-146
35	Added the Sealing Steam (SS) System to the scope of license renewal. Portions of the SS System are located in plant areas containing safety-related SSCs and are included in accordance with the NSAS scoping criteria (10 CFR 54.4(a)(2)). No new material and environment combinations have been introduced, no new aging effects have been identified, and no new aging management programs are required.	2.2-6 2.3-163 2.3-180 2.3-180a 2.3-180b 3.4-1 3.4-1a 3.4-9 3.4-9a 3.4-76 3.4-76a 3.4-78

Summary of Walkdown Results Changes		
Change Number	**Summary**	**Changed or New Page Numbers**
36	Reference to new boundary drawing LR-M508-2 has been added and LR-M508-1 has been revised to reflect the additional portions of the Plant Service Water (TSW) System added to the scope of license renewal. Portions of the TSW System are located in plant areas containing safety-related SSCs and are included in accordance with the NSAS scoping criteria (10 CFR 54.4(a)(2)). No new material and environment combinations have been introduced, no new aging effects have been identified, and no new aging management programs are required.	2.3-113
37	Removed the rupture discs in the Circulating Water (CW) System from the components subject to aging management review because they do not perform a component level intended function. Buried bolting and valves subject to cracking were identified in the CW System. As a result, the aging management review was updated to address the components and the aging effects.	2.3-37 2.3-37a 3.3-6 3.3-118 3.3-119 3.3-119a
38	Revised the discussion of the Buried Piping and Tanks Inspection Program to address cracking, loss of material, loss of pre-load on bolting, and loss of material on stainless steel piping and piping components as aging effects managed by the program. The Buried Piping and Tanks Inspection Program also manages loss of material due to pitting and crevice corrosion and microbiologically influenced corrosion.	3.3-55 3.3-55a 3.3-75 3.3-75a A-9 A-9a A-43 A-43a B-39 B-39a B-40 B-40a
39	Added bolting exposed to soil as a material and environment combination to be managed for buried bolts in the Diesel Fuel Oil System.	3.3-215 3.3-215a

Summary of Walkdown Results Changes		
Change Number	**Summary**	**Changed or New Page Numbers**
40	Added bolting exposed to soil as a material and environment combination to be managed for buried bolts in the Fire Protection System.	3.3-256 3.3-256a
41	Added bolting exposed to soil as a material and environment combination to be managed for buried bolts in the Radwaste Building HVAC System.	3.3-328 3.3-328a
42	Added components exposed to soil as a material and environment combination to be managed for buried bolts, orifices, piping, and valve bodies in the Service Water System.	3.3-390 3.3-390a
43	Added components exposed to soil as a material and environment combination to be managed for buried bolts and valve bodies in the Tower Makeup Water System.	3.3-395 3.3-395a
44	Added component type of south exterior slab for the Diesel Generator Building. The slab provides structural or functional support required to meet the requirement of 10 CFR 54.4(a)(3). The concrete slab is exposed to air-outdoor and soil environments.	2.4-24 2.4-24a 3.5-98 3.5-98a
48	Removed the Reactor Building Potable Hot Water System from Table 2.2-1 because the single component scoped into the system has been removed from the reactor building. As such, the system no longer exists.	2.2-6

W 21

2.3.3.10 Control Air System (CAS)

System Description

The CAS provides oil-free, filtered, and dried instrument-quality air throughout the plant for pneumatic instrumentation, controls, and actuators. The CAS also provides air to the outboard MSIV accumulators, and to the wetwell vacuum breaker solenoid pilot valves. The system is designed to provide uninterrupted service during normal plant operation.

The air receivers store compressed air to serve associated pneumatic loads. The Cooling Jacket Water (CJW) System is a closed water system provided to cool the three CAS compressors and the two CAS refrigerated dryers. Operation of CAS is not required for the initiation of any engineered safeguard system or for safe shutdown of the reactor, but is required for continuous plant operation. Based on this, operation of the CAS is not required for mitigation of a design basis accident or abnormal operational transient.

Reason for Scope Determination

The CAS provides Primary Containment isolation and integrity. This system-intended function is safety-related. Therefore, the CAS meets the scoping criteria of 10 CFR 54.4(a)(1).

The CAS does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The CAS does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the CAS meets the scoping criteria of 10 CFR 54.4(a)(2).

The CAS is not relied upon to demonstrate compliance with the 10 CFR 54.4(a)(3) scoping criteria for any regulated events.

FSAR References

Sections 9.3.1.1.1 and 9.3.1.3.1 of the FSAR describe the Control Air System.

License Renewal Drawings

The following license renewal drawings depict the evaluation boundaries for the system components within the scope of license renewal:

LR-M510-2, LR-M510-2A

Insert: ", LR-M532"

Components Subject to AMR

Table 2.3.3-10 lists the component types that require AMR and their intended functions.

W 22-1

2.3.4.2 Condensate (Auxiliary) (CO) System

System Description

The CO System returns condensate from the Auxiliary Steam System, which operates only when the heating steam evaporators are inoperative during plant shutdown, to the Condensate Return Tank, by means of either the Radwaste Building Heating Condensate Pump Set (WHCO-CU-1) or the Condensate Pump Set (SHCO-CU-1).

Reason for Scope Determination

The CO System does not perform any safety-related system intended functions that meet the scoping criteria in 10 CFR 54.4(a)(1).

The CO System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The CO System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the CO System meets the scoping criteria of 10 CFR 54.4(a)(2).

The CO System is not relied upon to demonstrate compliance with the 10 CFR 54.4(a)(3) scoping criteria for any regulated events.

FSAR References

Section 1.2.2.12.16 of the FSAR describes the CO System.

License Renewal Drawings

The following license renewal drawings depict the evaluation boundaries for the system components within the scope of license renewal:

LR-M513, LR-M783

Insert: ", LR-M514-1"

Components Subject to AMR

Table 2.3.4-2 lists the component types that require AMR and their intended functions.

Table 3.4.2-2, Aging Management Review Results – Condensate (Auxiliary) System, provides the results of the AMR.

Amendment 1

W 22-2

Table 2.3.4-2
Condensate (Auxiliary) System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Bolting	Structural integrity
Condenser	Structural integrity
Piping	Structural integrity
Pump casing	Structural integrity
Valve body	Structural integrity

Insert A from page 2.3-167a

Amendment 1

W 22-2

Insert A to Table 2.3.4-2:

Tank	Structural integrity

W 22-3

- Chemistry Program Effectiveness Inspection
- External Surfaces Monitoring Program
- Flow-Accelerated Corrosion (FAC) Program
- Selective Leaching Inspection

3.4.2.1.2 Condensate (Auxiliary) System

Materials

The materials of construction for subject mechanical components of the Condensate (Auxiliary) System are:

- Gray cast iron
- Steel

Environments

Subject mechanical components of the Condensate (Auxiliary) System are exposed to the following normal operating environments:

- Air-indoor uncontrolled
- Air-outdoor
- Treated water > 60 °C (140 °F)

Add: "Moist air"

Aging Effects Requiring Management

The following aging effects require management for the subject mechanical components of the Condensate (Auxiliary) System:

- Loss of material
- Loss of pre-load

Aging Management Programs

The following aging management programs manage the aging effects for subject mechanical components of the Condensate (Auxiliary) System:

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- External Surfaces Monitoring Program

Add: "Supplemental Piping/Tank Inspection"

Amendment 1

W 22-4

Table 3.4.1 Summary of Aging Management Programs for Steam and Power Conversion Systems Evaluated in Chapter VIII of NUREG-1801

Item Number	Component/Commodity	Aging Effect/ Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.4.1-04	Steel piping, piping components, and piping elements exposed to treated water	Loss of material due to general, pitting and crevice corrosion	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801. ~~The BWR Water Chemistry Program, in conjunction with the Chemistry Program Effectiveness Inspection, is credited to manage loss of material for steel piping, piping components, and piping elements in the steam and power conversion systems exposed to treated water, including treated water >60 C (140 °F).~~ Refer to Section 3.4.2.2.2.1 for further information.

Insert A from page 3.4-14a

Insert A to Page 3.4.-14

The BWR Water Chemistry Program, in conjunction with the Chemistry Program Effectiveness Inspection, is credited to manage loss of material for steel piping, piping components, piping elements and tanks in the steam and power conversion systems exposed to treated water, including treated water >60 °C (140 °F).

W 22-5

Table 3.4.2-2 Aging Management Review Results – Condensate (Auxiliary) System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
18	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (External)	None	None	VIII.H-7	3.4.1-28	I 0406
19	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VIII.H-7	3.4.1-28	C 0404
20	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VIII.H-7	3.4.1-28	A

Add new rows 21 through 25 to Table 3.4.2-2 as shown on pages 3.4-43a

W 22-5

Table 3.4.2-2 Aging Management Review Results – Condensate (Auxiliary) System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
21	Tank (CO-TK-4)	Structural integrity	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VIII.H-7	3.4.1-28	C 0404
22	Tank (CO-TK-4)	Structural integrity	Steel	Moist air (Internal)	Loss of material	Supplemental Piping/Tank Inspection	N/A	N/A	G
23	Tank (CO-TK-4)	Structural integrity	Steel	Treated water > 60 °C (140 °F) (Internal)	Loss of material	BWR Water Chemistry	VIII.E-33	3.4.1-04	C
24	Tank (CO-TK-4)	Structural integrity	Steel	Treated water > 60 °C (140 °F) (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VIII.E-33	3.4.1-04	C
25	Tank (CO-TK-4)	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VIII.H-7	3.4.1-28	A

W 22-6

B.2.51 Supplemental Piping/Tank Inspection

Program Description

The Supplemental Piping/Tank Inspection is a new one-time inspection that will detect and characterize the material condition of steel, gray cast iron, and stainless steel components that are exposed to moist air environments, particularly the aggressive alternate wet and dry environment that exists at air-water interfaces or air spaces of susceptible piping and tanks. The inspection provides direct evidence as to whether, and to what extent, loss of material due to crevice, galvanic, general, and pitting corrosion, or MIC has occurred or is likely to occur that could result in a loss of intended function of the subject components.

Implementation of the Supplemental Piping/Tank Inspection will ensure that the pressure boundary integrity of susceptible safety-related components is maintained consistent with the current licensing bases during the period of extended operation. Implementation of the inspection will also ensure that the structural integrity of susceptible NSR components will be maintained such that spatial interactions (e.g., leakage) will not result in the loss of any safety-related component intended functions during the period of extended operation.

NUREG-1801 Consistency

The Supplemental Piping/Tank Inspection is a new one-time inspection for Columbia that will be consistent with the 10 elements of an effective aging management program as described in NUREG-1801, Section XI.M32, "One-Time Inspection."

Exceptions to NUREG-1801

None.

Aging Management Program Elements

The results of an evaluation of each program element are provided below.

- Scope of Program
  The scope of the Supplemental Piping/Tank Inspection includes the internal and external surfaces of steel, gray cast iron, and stainless steel components at air-water interfaces and other susceptible locations in the following systems:
  - Condensate (Nuclear) (COND) System
  - Containment Vacuum Breakers (CVB)
  - Diesel Cooling Water (DCW) System
  - Equipment Drains Radioactive (EDR) System

Add: "Condensate (Auxiliary) (CO) System"

Amendment 1

W 23-1

License Renewal Drawings

The following license renewal drawings depict the evaluation boundaries for the system components within the scope of license renewal:

LR-M504-2, LR-M526-1, LR-M527-1

Insert: ", LR-M527-2, LR-M532, LR-M534"

Components Subject to AMR

Table 2.3.4-3 lists the component types that require AMR and their intended functions.

Table 3.4.2-3, Aging Management Review Results – Condensate (Nuclear) System, provides the results of the AMR.

The condenser tubes are not subject to AMR because they do not perform a license renewal intended function of the COND System.

W 23-2

Table 2.3.4-3
Condensate (Nuclear) System
Components Subject to Aging Management Review

Component Type	**Intended Function (as defined in Table 2.0-1)**
Bolting	Pressure boundary Structural integrity
Heat exchanger (shell)	Pressure boundary
Orifice	Pressure boundary Structural integrity Throttling
Piping	Pressure boundary Structural integrity
Pump casing	Structural integrity
Tank (COND-TK-1A, COND-TK-1B)	Pressure boundary
Tubing	Pressure boundary Structural integrity
Valve body	Pressure boundary Structural integrity

Insert A from page 2.3-170a

Amendment 1

W 23-2

Insert A to Table 2.3.4-3:

Flexible connection	Structural integrity

W 23-3

Table 3.4.2-3 Aging Management Review Results – Condensate (Nuclear) System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
78	Valve Body	Structural integrity	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VIII.I-10	3.4.1-41	A
79	Valve Body	Structural integrity	Stainless Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	N/A	N/A	G
80	Valve Body	Structural integrity	Steel	Treated water (Internal)	Loss of material	BWR Water Chemistry	VIII.E-33	3.4.1-04	A
81	Valve Body	Structural integrity	Steel	Treated water (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VIII.E-33	3.4.1-04	A
82	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VIII.H-7	3.4.1-28	A
83	Valve Body	Structural integrity	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VIII.H-10	3.4.1-28	A

Insert new rows 84 through 87 to Table 3.4.2-3 as shown on page 3.4-53a

Amendment 1

W 23-3

Table 3.4.2-3 Aging Management Review Results – Condensate (Nuclear) System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
84	Flexible Connection	Structural integrity	Steel	Treated water (Internal)	Loss of material	BWR Water Chemistry	VIII.E-33	3.4.1-04	A
85	Flexible Connection	Structural integrity	Steel	Treated water (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VIII.E-33	3.4.1-04	A
86	Flexible Connection	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VIII.H-7	3.4.1-28	A
87	Flexible Connection	Structural integrity	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VIII.H-10	3.4.1-28	A

W 24

2.3.3.2 Condensate Processing Radioactive (Demineralizer) (CPR) System

System Description

The CPR System, also referred to as the Condensate Filter Demineralizer System, is designed to maintain feedwater quality such that the reactor water limits are not exceeded. The system removes corrosion products, condenser inleakage impurities, and impurities present in the condensed steam. The system controls the condensate impurity concentration during plant operation. The system functions as a chemical mixing and supply system to clean the filter demineralizer units and direct the waste to the chemical waste system, as a backwash system to remove the spent resin from the filter demineralizers and direct the waste to the backwash receiving tank, and as a precoat system to circulate fresh precoat material through the filter demineralizers.

Reason for Scope Determination

The CPR System does not perform any safety-related system-intended functions that meet the scoping criteria of 10 CFR 54.4(a)(1).

The CPR System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The CPR System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the CPR System meets the scoping criterion of 10 CFR 54.4(a)(2).

The CPR System is not relied upon to demonstrate compliance with the 10 CFR 54.4(a)(3) scoping criteria for any regulated events.

FSAR References

Section 10.4.6 of the FSAR describes the Condensate Filter Demineralizer System, evaluated for license renewal as the Condensate Processing Radioactive (Demineralizer) System.

License Renewal Drawings

The following license renewal drawings depict the evaluation boundaries for the system components within the scope of license renewal:

LR-M523-1, LR-M526-1 Insert: ", LR-M536"

Components Subject to AMR

Table 2.3.3-2 lists the component types that require AMR and their intended functions.

Table 3.3.2-2, Aging Management Review Results – Condensate Processing Radioactive (Demineralizer) System, provides the results of the AMR.

W 25

2.3.3.23 Floor Drain (FD) System

System Description

The FD System consists of non-radioactive floor drain subsystems in the Service Building and Turbine Building.

Floor drains from normally uncontaminated areas of the Turbine Building are collected in three sumps. All three sumps are routed to the Radwaste System for processing.

Floor drains in the Service Building are collected in a single sump containing two sump pumps. Water collected in the Service Building floor drain sump is pumped to the storm water drainage system. Water collected by the storm water drainage system is conveyed by a concrete pipe to a point approximately 1,500 feet northeast of the plant. The pipe discharges to an earthen channel that carries the water to a small unlined evaporation and percolation pond. Roof drains, which are evaluated as part of the FD System, are drained by gravity or pumped to the storm drain system.

Reason for Scope Determination

The FD System contains components designated as safety-related by Columbia choice. Therefore, the FD System meets the scoping criteria of 10 CFR 54.4(a)(1).

The FD System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The FD System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the FD System meets the scoping criteria of 10 CFR 54.4(a)(2).

The FD System is not relied upon to demonstrate compliance with any regulated event and does not meet the 10 CFR 54.4(a)(3) scoping criteria.

FSAR References

Section 9.3.3.2.3 of the FSAR describes the Nonradioactive Water Drainage System, and the Roof Drain System, evaluated collectively for license renewal as the Floor Drain System.

License Renewal Drawings

The following license renewal drawings depict the evaluation boundaries for the system components within the scope of license renewal:

Insert: ", LR-M531"

LR-M539, LR-M540, LR-M788-1, LR-M852, LR-216-01,3682

Amendment 1

W 26-1

Reason for Scope Determination

The EDR System provides Primary Containment isolation and integrity (including valve position indication), and secondary containment isolation and integrity (including valve position indication). These system-intended functions are safety-related. Therefore, the EDR System meet the scoping criteria of 10 CFR 54.4(a)(1).

The EDR System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The EDR System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the EDR System meets the scoping criteria of 10 CFR 54.4(a)(2).

The EDR System is relied upon to demonstrate compliance with, and meets the 10 CFR 54.4(a)(3) scoping criteria for, the Environmental Qualification (10 CFR 50.49) regulated event.

FSAR References

Section 9.3.3.2.1 of the FSAR describes the Radioactive Equipment Drainage System, evaluated for license renewal as the Equipment Drains Radioactive System.

License Renewal Drawings

The following license renewal drawings depict the evaluation boundaries for the system components within the scope of license renewal:

Insert: ", LR-M532"

LR-M521-2, LR-M523-2, LR-M537, LR-M539

Components Subject to AMR

Table 2.3.3-21 lists the component types that require AMR and their intended functions.

Table 3.3.2-21, Aging Management Review Results – Equipment Drains Radioactive System, provides the results of the AMR.

Solenoid pilot valves and the associated air lines provide a control air supply to actuators for the primary and secondary containment isolation valves (EDR-V-19, EDR-V-20, EDR-V-394, and EDR-V-395). Failure of the air supply places the valve in a safe position that supports the system function. Therefore, pressure boundary integrity is not a required component intended function of these solenoid valves, air supply lines, or actuators for the system to perform its intended function. Since these components have no other component intended function, they are not subject to AMR.

The external subcomponents (shell and channel covers) of the in-scope heat exchangers will contain fluid leakage in the event of a failure of an internal

W 26-2

subcomponent (tubes and tubesheet). Failure of an internal subcomponent will therefore not create the potential for spatial interaction that could prevent a safety-related SSC from performing its intended function. As a result, the internal subcomponents (tubes and tubesheet) of the in-scope heat exchangers are not subject to AMR.

Table 2.3.3-21
Equipment Drains Radioactive System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Bolting	Pressure Boundary Structural Integrity
Heat exchanger (channel and shell)	Structural Integrity
Orifice	Structural Integrity
Piping	Pressure Boundary Structural Integrity
Sight glass	Structural Integrity
Tubing	Structural Integrity
Valve body	Pressure Boundary Structural Integrity

Insert A from page 2.3-91a

W 26-2

Insert A to Table 2.3.3-21:

Pump casing	Structural Integrity
Tank	Structural Integrity

W 26-3

- Loss of pre-load
- Reduction of heat transfer

Aging Management Programs

The following aging management programs manage the aging effects for subject mechanical components of the Diesel Lubricating Oil System:

- Bolting Integrity Program
- Chemistry Program Effectiveness Inspection
- Closed Cooling Water Chemistry Program
- External Surfaces Monitoring Program
- Heat Exchangers Inspection
- Lubricating Oil Analysis Program
- Lubricating Oil Inspection

3.3.2.1.21 Equipment Drains Radioactive System

Materials

The materials of construction for subject mechanical components of the Equipment Drains Radioactive System are:

- Glass
- Stainless steel
- Steel

Environments

Subject mechanical components of the Equipment Drains Radioactive System are exposed to the following normal operating environments:

- Air-indoor uncontrolled
- Closed cycle cooling water
- Concrete
- Raw water
- Treated water

Add "Moist Air" as a new bullet in the list of environment

Amendment 1

W 26-4

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of NUREG-1801

Item Number	Component/Commodity	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-76	Steel piping, piping components, and piping elements (without lining/coating or with degraded lining/coating) exposed to raw water	Loss of material due to general, pitting, crevice, and microbiologically influenced corrosion, fouling, and lining/coating degradation	Open-Cycle Cooling Water System Replace deleted text with: "drain piping and tanks"	No	Consistent with NUREG-1801, with exceptions. Except as noted below, the Open-Cycle Cooling Water Program is credited to manage loss of material for steel piping, piping components, and piping elements that are exposed to raw water. For steel piping and piping components in the other auxiliary systems that are exposed to raw water, the following programs are credited to manage loss of material: • Diesel Starting Air Inspection for drain piping in Diesel Starting Air System • Diesel Systems Inspection for drain piping in the Diesel (Engine) Exhaust System • Monitoring and Collection Systems Inspection for ~~drain piping~~ in Equipment Drains Radioactive, Floor Drain, and Floor Drain Radioactive systems

W 26-5

Table 3.3.2-21 Aging Management Review Results – Equipment Drains Radioactive System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
52	Valve Body	Structural integrity	Steel	Treated water (Internal)	Loss of material	Monitoring and Collection Systems Inspection	VII.E3-18	3.3.1-17	E
53	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A

Insert new rows 54 through 60 for Table 3.3.2-21 after this page

Amendment 1

Table 3.3.2-21 Aging Management Review Results – Equipment Drains Radioactive System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
54	Pump Casing (EDR-P14A, 14B, 15)	Structural integrity	Stainless Steel	Air-indoor uncontrolled (Internal)	None	None	VII.J-15	3.3.1-94	A 0306
55	Pump Casing (EDR-P14A, 14B, 15)	Structural integrity	Stainless Steel	Raw water (Internal)	Loss of material	Monitoring and Collection Systems Inspection	VII.C1-15	3.3.1-79	E
56	Pump Casing (EDR-P14A, 14B, 15)	Structural integrity	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A
57	Tank (EDR-TK-4A, 4B, 5)	Structural integrity	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	C 0302
58	Tank (EDR-TK-4A, 4B, 5)	Structural integrity	Steel	Moist air (Internal)	Loss of material	Supplemental Piping/Tank Inspection	VII.H2-21	3.3.1-71	E 0303
59	Tank (EDR-TK-4A, 4B, 5)	Structural integrity	Steel	Raw water (Internal)	Loss of material	Monitoring and Collection Systems Inspection	VII.C1-19	3.3.1-76	E
60	Tank (EDR-TK-4A, 4B, 5)	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A

W 27-1

FDR-V-3 and FDR-V-4). These system-intended functions are safety-related. Therefore, the FDR System meets the scoping criteria of 10 CFR 54.4(a)(1).

The FDR System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The FDR System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the FDR System meets the scoping criteria of 10 CFR 54.4(a)(2).

The FDR System is relied upon to demonstrate compliance with, and meets the 10 CFR 54.4(a)(3) scoping criteria for, the Environmental Qualification (10 CFR 50.49) regulated event.

FSAR References

Section 9.3.3.2.2 of the FSAR describes the Radioactive Floor Drainage Subsystem, evaluated for license renewal as the Floor Drain Radioactive System.

License Renewal Drawings

The following license renewal drawing depicts the evaluation boundaries for the system components within the scope of license renewal:

LR-M539 Insert: ", LR-M531"

Components Subject to AMR

Table 2.3.3-24 lists the component types that require AMR and their intended functions.

Table 3.3.2-24, Aging Management Review Results – Floor Drain Radioactive System, provides the results of the AMR.

Solenoid pilot valves and associated air lines provide a control air supply to actuators for the primary and secondary containment isolation valves (FDR-V-3, 4, and 219 through 222). Failure of the air supply places the valve in a safe position that supports the system function. Therefore, pressure boundary integrity is not a required component intended function of these solenoid valves, air supply lines, or actuators for the system to perform its intended function. Since these components have no other component intended function, they are not subject to AMR.

Spectacle flanges (FDR-SF-1 and 2) are normally open. As such the spectacle does not perform any license renewal function and is not subject to AMR. The flange portion of the component is evaluated as piping.

W 27-2

**Table 2.3.3-24
Floor Drain Radioactive System
Components Subject to Aging Management Review**

Component Type	Intended Function (as defined in Table 2.0-1)
Bolting	Pressure Boundary Structural Integrity
Orifice	Structural Integrity
Piping	Pressure Boundary Structural Integrity
Tubing	Structural Integrity
Valve body	Pressure Boundary Structural Integrity

Insert A from page 2.3-102a

W 27-2

Insert A to Table 2.3.3-24:

Pump casing	Structural Integrity
Tank	Structural Integrity

W 27-3

3.3.2.1.24 Floor Drain Radioactive System

Materials

The materials of construction for subject mechanical components of the Floor Drain Radioactive System are:

- Stainless steel
- Steel

Environments

Subject mechanical components of the Floor Drain Radioactive System are exposed to the following normal operating environments:

- Air-indoor uncontrolled
- Concrete
- Raw water
- Treated water

Add "Moist air" as new bullet in the list of environments

Aging Effects Requiring Management

The following aging effects require management for the subject mechanical components of the Floor Drain Radioactive System:

- Loss of material
- Loss of pre-load

Aging Management Programs

The following aging management programs manage the aging effects for subject mechanical components of the Floor Drain Radioactive System:

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- External Surfaces Monitoring Program
- Monitoring and Collection Systems Inspection
- Supplemental Piping/Tank Inspection

Amendment 1

W 27-4

Table 3.3.2-24 Aging Management Review Results – Floor Drain Radioactive System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
37	Valve Body	Structural integrity	Stainless Steel	Raw water (Internal)	Loss of material	Monitoring and Collection Systems Inspection	VII.C1-15	3.3.1-79	E
38	Valve Body	Structural integrity	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A
39	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	C 0302
40	Valve Body	Structural integrity	Steel	Raw water (Internal)	Loss of material	Monitoring and Collection Systems Inspection	VII.C1-19	3.3.1-76	E
41	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A

Insert new rows 42 through 47 for Table 3.3.2-24 after this page

Amendment 1

W 27-4

Table 3.3.2-24 Aging Management Review Results – Floor Drain Radioactive System									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
42	Pump Casing (FDR-P-21)	Structural integrity	Stainless Steel	Raw water (Internal)	Loss of material	Monitoring and Collection Systems Inspection	VII.C1-15	3.3.1-79	E
43	Pump Casing (FDR-P-21)	Structural integrity	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A
44	Tank (FDR-TK-9)	Structural integrity	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	C 0302
45	Tank (FDR-TK-9)	Structural integrity	Steel	Moist air (Internal)	Loss of material	Supplemental Piping/Tank Inspection	VII.H2-21	3.3.1-71	E 0303
46	Tank (FDR-TK-9)	Structural integrity	Steel	Raw water (Internal)	Loss of material	Monitoring and Collection Systems Inspection	VII.C1-19	3.3.1-76	E
47	Tank (FDR-TK-9)	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A

W 28-1

Table 2.2-1
License Renewal Scoping Results for Mechanical Systems (continued)

System Name	In Scope?	Screening Results Section
Floor Drain Radioactive	Yes	2.3.3.24
Fuel Oil	Yes	2.3.3.18
Fuel Pool Cooling	Yes	2.3.3.25
Glycol	No	
Guard House Exhaust Air	No	
Guard House Fire Protection	No	
Guard House Mixed Air	No	
Guard House Outside Air	No	
Guard House Potable Hot Water	No	
Guard House Return Air	No	
Heater Drain	No	
Heater Vents	No	
Heating Hot Water	No	
Heating Steam	Yes ~~No~~	2.3.3.48
Heating Steam Condensate	Yes ~~No~~	2.3.3.49
Heating Steam Vent	Yes ~~No~~	2.3.3.50
High-Pressure Core Spray	Yes	2.3.2.3
Hydrogen	No	
Hydrogen Water Chemistry	No	
Independent Spent Fuel Storage Installation	No	
Instrument Rack	Yes	2.3.3.40
Isophase Bus Duct Cooling	No	
Laboratory Equipment (Permanent Plant)	No	
Leak Detection	Yes	2.3.3.26
Local Power Range Monitor	Yes	2.3.1.2
Low-Pressure Core Spray	Yes	2.3.2.4
Machine Shop Equipment	No	
Main Steam	Yes	2.3.4.4

W28-2

Leak Detection (LD) System (Section 2.3.3.26)

Miscellaneous Waste Radioactive (MWR) System (Section 2.3.3.27)

Plant Sanitary Drains (PSD) System (Section 2.3.3.28)

Plant Service Water (TSW) System (Section 2.3.3.29)

Potable Cold Water (PWC) System (Section 2.3.3.30)

Potable Hot Water (PWH) System (Section 2.3.3.31)

Primary Containment (C) System (Section 2.3.3.32)

Process Sampling (PS) System (Section 2.3.3.33)

Process Sampling Radioactive (PSR) System (Section 2.3.3.34)

Pump House HVAC Systems (Section 2.3.3.35)

Radwaste Building Chilled Water (WCH) System (Section 2.3.3.36)

Radwaste Building HVAC Systems (Section 2.3.3.37)

Reactor Building HVAC Systems (Section 2.3.3.38)

Reactor Closed Cooling Water (RCC) System (Section 2.3.3.39)

Reactor Protection System (RPS) (Section 2.3.3.40)

Reactor Water Cleanup (RWCU) System (Section 2.3.3.41)

Service Air (SA) System (Section 2.3.3.42)

Standby Liquid Control (SLC) System (Section 2.3.3.43)

Standby Service Water (SW) System (Section 2.3.3.44)

Suppression Pool Temperature Monitoring (SPTM) System (Section 2.3.3.45)

Tower Makeup Water (TMU) System (Section 2.3.3.46)

Traversing Incore Probe (TIP) System (Section 2.3.3.47)

A brief system description, reason for scope determination, associated FSAR references, associated license renewal drawings, and components subject to AMR information are provided for each system.

Insert:
"Heating Steam (Section 2.3.3.48)
Heating Steam Condensate (Section 2.3.3.49)
Heating Steam Vent System (Section 2.3.3.50)"

Amendment 1

W 28-3

Table 2.3.3-44
Traversing Incore Probe System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Bolting	Pressure Boundary Structural Integrity
Chamber shield	Structural Integrity
Piping	Pressure Boundary Structural Integrity
Valve body	Pressure Boundary Structural Integrity

Insert pages 2.3-162a through 2.3-162f following this page

W 28-3

2.3.3.48 Heating Steam System

System Description

The Heating Steam (HS) System originates from four pressure reducing stations (two in the Turbine Generator Building and one each in the Reactor and Radwaste buildings). Steam at 200 psig pressure is supplied to these pressure reducing stations from either the auxiliary boiler or the gland steam evaporator. At the pressure reducing stations, the steam pressure is reduced to 50 psig and this steam is fed to the heating coils, humidifiers, steam unit heaters, and hot water heat exchanger.

Reason for Scope Determination

The HS System does not perform any safety-related system intended functions that meet the scoping criteria of 10 CFR 54.4(a)(1).

The HS System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The HS System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the HS System meets the scoping criteria of 10 CFR 54.4(a)(2).

The HS System is not relied upon to demonstrate compliance with the 10 CFR 54.4(a)(3) scoping criteria for any regulated events.

FSAR References

Section 9.4.16.2 of the FSAR describes the Heating Steam System.

License Renewal Drawings

The following license renewal drawing depicts the evaluation boundaries for the system components within the scope of license renewal:

LR-M514-1

Components assigned by equipment piece number (EPN) to the Radwaste Building Mixed Air (WMA), Radwaste Building Outside Air (WOA), and Radwaste Building Return Air (WRA) systems are included within the evaluation boundaries of the HS System for completeness (see LR-M514-1).

W 28-3

Components Subject to AMR

Table 2.3.3-45 lists the component types that require AMR and their intended functions.

Table 3.3.2-45, Aging Management Review Results – Heating Steam System, provides the results of the AMR.

Table 2.3.3-45
Heating Steam System
Components Subject to Aging Management Review

Component Type	**Intended Function (as defined in Table 2.0-1)**
Bolting	Structural integrity
Heat exchanger (heating coil headers)	Structural integrity
Heat exchanger (heating coil tubes)	Structural integrity
Humidifier	Structural integrity
Piping	Structural integrity
Strainer (body)	Structural integrity
Trap body	Structural integrity
Tubing	Structural integrity
Valve body	Structural integrity

W 28-4

- Fire Protection System (Section 2.3.3.22)
- Floor Drain System (Section 2.3.3.23)
- Floor Drain Radioactive System (Section 2.3.3.24)
- Fuel Pool Cooling System (Section 2.3.3.25)
- Miscellaneous Waste Radioactive System (Section 2.3.3.27)
- Plant Sanitary Drains System (Section 2.3.3.28)
- Plant Service Water System (Section 2.3.3.29)
- Potable Cold Water System (Section 2.3.3.30)
- Potable Hot Water System (Section 2.3.3.31)
- Primary Containment System (Section 2.3.3.32)
- Process Sampling System (Section 2.3.3.33)
- Process Sampling Radioactive System (Section 2.3.3.34)
- Pump House HVAC Systems (Section 2.3.3.35)
- Radwaste Building Chilled Water System (Section 2.3.3.36)
- Radwaste Building HVAC Systems (Section 2.3.3.37)
- Reactor Building HVAC Systems (Section 2.3.3.38)
- Reactor Closed Cooling Water System (Section 2.3.3.39)
- Reactor Water Cleanup System (Section 2.3.3.41)
- Service Air System (Section 2.3.3.42)
- Standby Liquid Control System (Section 2.3.3.43)
- Standby Service Water System (Section 2.3.3.44)
- Tower Makeup Water System (Section 2.3.3.46)
- Traversing Incore Probe System (Section 2.3.3.47)

Add Insert A from page 3.3-2a

Table 3.3.1, Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of NUREG-1801, provides the summary of the programs evaluated in NUREG-1801 that are applicable to component and commodity groups in this section. Text addressing summary items requiring further evaluation is provided in Section 3.3.2.2.

W28-4

Insert A to LRA Section 3.3.1

- Heating Steam System (Section 2.3.3.48)
- Heating Steam Condensate System (Section 2.3.3.49)
- Heating Steam Vent System (Section 2.3.3.50)

W 28-5

Table 3.3.2-39 Aging Management Review Results – Reactor Water Cleanup System

Table 3.3.2-40 Aging Management Review Results – Service Air System

Table 3.3.2-41 Aging Management Review Results – Standby Liquid Control System

Table 3.3.2-42 Aging Management Review Results – Standby Service Water System

Table 3.3.2-43 Aging Management Review Results – Tower Makeup Water System

Table 3.3.2-44 Aging Management Review Results – Traversing Incore Probe System

Add Insert A from page 3.3-5a

3.3.2.1 Materials, Environments, Aging Effects Requiring Management, and Aging Management Programs

The materials from which specific components and commodities are fabricated, the environments to which they are exposed, the aging effects requiring management, and the aging management programs used to manage these aging effects are provided for each of the above systems in the following sections.

3.3.2.1.1 Circulating Water System

Materials

The materials of construction for subject mechanical components of the Circulating Water System are:

- Concrete
- Gray cast iron
- Stainless steel
- Steel

Environments

Subject mechanical components of the Circulating Water System are exposed to the following normal operating environments:

- Air-outdoor
- Raw water
- Soil

W 28-5

Insert A to LRA Section 3.3.2

Table 3.3.2-45 Aging Management Review Results – Heating Steam System

Table 3.3.2-46 Aging Management Review Results – Heating Steam Condensate System

Table 3.3.2-47 Aging Management Review Results – Heating Steam Vent System

W 28-6

- External Surfaces Monitoring Program

Add new sections 3.3.2.1.45 through 47 as shown on pages 3.3-50a through d

3.3.2.2 Further Evaluation of Aging Management as Recommended by NUREG-1801

For the Auxiliary Systems, those items requiring further evaluation are addressed in the following sections.

3.3.2.2.1 Cumulative Fatigue Damage

Fatigue is a time-limited aging analysis, as defined in 10 CFR 54.3. Time-limited aging analyses are required to be evaluated in accordance with 10 CFR 54.21(c). Time-limited aging analyses identified for fatigue in the Auxiliary Systems are evaluated in Section 4.3.4.

3.3.2.2.2 Reduction of Heat Transfer due to Fouling

As described in Table 3.3.1, the Fuel Pool Cooling System has stainless steel heat exchanger tubes in treated water which are evaluated under item number 3.3.1-03. Fouling of stainless steel heat exchanger tubes in treated water is managed by the BWR Water Chemistry Program, in conjunction with the Heat Exchangers Inspection.

3.3.2.2.3 Cracking due to Stress Corrosion Cracking (SCC)

3.3.2.2.3.1 BWR Standby Liquid Control System

The treated water environment for the Standby Liquid Control System uses an aqueous solution of sodium pentaborate decahydrate. The system is normally in standby with the fluid temperature maintained above the 60°F saturation temperature in an area where the ambient temperature is less than 100°F during normal plant operation. Since the temperature is below 140°F during normal plant operation, cracking due to SCC is not an aging effect requiring management for the stainless steel components of the Standby Liquid Control System.

3.3.2.2.3.2 Heat Exchanger Components

As described in Table 3.3.1, there are no components compared to item number 3.3.1-05. The Reactor Water Cleanup regenerative and non-regenerative heat exchangers at Columbia have no stainless steel components subject to AMR. Therefore, cracking of these components due to stress corrosion cracking is not an aging effect requiring management. Refer to item 3.3.1-48 (no further evaluation required) for the aging effects that do require management for these components.

3.3.2.2.3.3 Diesel Engine Exhaust Piping, Piping Components, and Piping Elements

During normal plant operations, diesel exhaust piping, piping components, and piping elements are exposed to diesel exhaust infrequently and for short durations. For the remaining time, these components are exposed internally to outdoor air. As such, temperatures above 140°F occur only infrequently and for short durations. Therefore, cracking due to SCC is not identified as an aging effect requiring management for

W 28-6

3.3.2.1.45 Heating Steam System

Materials

The materials of construction for subject mechanical components of the Heating Steam System are:

- Copper alloy
- Gray cast iron
- Stainless steel
- Steel

Environments

Subject mechanical components of the Heating Steam System are exposed to the following normal operating environments:

- Air-indoor uncontrolled
- Steam

Aging Effects Requiring Management

The following aging effects require management for the subject mechanical components of the Heating Steam System:

- Cracking
- Loss of material
- Loss of pre-load

Aging Management Programs

The following aging management programs manage the aging effects for subject mechanical components of the Heating Steam System:

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- External Surfaces Monitoring Program

W 28-6

- Flow-Accelerated Corrosion (FAC) Program
- Selective Leaching Inspection

3.3.2.1.46 Heating Steam Condensate System

Materials

The materials of construction for subject mechanical components of the Heating Steam Condensate System are:

- Copper alloy
- Gray cast iron
- Steel

Environments

Subject mechanical components of the Heating Steam Condensate System are exposed to the following normal operating environments:

- Air-indoor uncontrolled
- Moist Air
- Steam
- Treated water > 60 °C (140 °F)

Aging Effects Requiring Management

The following aging effects require management for the subject mechanical components of the Heating Steam Condensate System:

- Loss of material
- Loss of pre-load

Aging Management Programs

The following aging management programs manage the aging effects for subject mechanical components of the Heating Steam Condensate System:

- Bolting Integrity Program

W 28-7

an aggressive environment. Therefore, loss of material due to pitting and crevice corrosion is not an aging effect requiring management for these components.

3.3.2.2.10.7 Stainless Steel Piping, Piping Components, and Piping Elements - Soil

~~As described in Table 3.3.1, there are no components compared to item number 3.3.1-29. There is no stainless steel piping subject to AMR for Columbia that is exposed to soil in the Auxiliary systems.~~ Replace with Insert A on page 3.3-55a

3.3.2.2.10.8 BWR Standby Liquid Control System

Loss of material due to pitting and crevice corrosion for stainless steel piping components and tanks exposed to sodium pentaborate solution is managed by the BWR Water Chemistry Program. The BWR Water Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a verification of the effectiveness of the BWR Water Chemistry Program to manage loss of material due to pitting and crevice corrosion through examination of stainless steel piping components and tanks exposed to sodium pentaborate solution.

3.3.2.2.11 Loss of Material due to Pitting, Crevice, and Galvanic Corrosion

Replace with Insert B from page 3.3-55a

~~As described in Table 3.3.1, there were no components compared to item number 3.3.1-31. There are no copper alloy piping, piping components, or piping elements in the Auxiliary systems that are exposed to treated water.~~

3.3.2.2.12 Loss of Material due to Pitting, Crevice, and Microbiologically Influenced Corrosion

3.3.2.2.12.1 Piping, Piping Components, and Piping Elements – Fuel Oil

There are no aluminum piping components exposed to fuel oil that are subject to AMR.

Loss of material due to pitting and crevice corrosion and MIC for stainless steel and copper alloy piping components exposed to fuel oil is managed by the Fuel Oil Chemistry Program. The Fuel Oil Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a verification of the effectiveness of the Fuel Oil Chemistry Program to manage loss of material through examination of piping and components exposed to fuel oil.

3.3.2.2.12.2 Piping, Piping Components, and Piping Elements – Lubricating Oil

Loss of material due to pitting and crevice corrosion and MIC for stainless steel piping components and heat exchanger components exposed to lubricating oil is managed by the Lubricating Oil Analysis Program. The Lubricating Oil Analysis Program manages aging effects through periodic monitoring and control of contaminants, including water. The Lubricating Oil Inspection will provide a verification of the effectiveness of the

W 28-7

Insert A to LRA Section 3.3.2.2.10.7

The Buried Piping Thanks Inspection Program, with enhancement, manages loss of material due to pitting and crevice corrosion and microbiologically influenced corrosion (MIC) for stainless steel piping and piping components buried in soil.

Insert B to LRA Section 3.3.2.2.11

Loss of material due to pitting, crevice, and galvanic corrosion for copper alloy piping, piping components, or piping elements exposed to treated water is managed by the BWR Water Chemistry Program. The BWR Water Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a verification of the effectiveness of the BWR Water Chemistry Program to manage loss of material due to pitting, crevice, and galvanic corrosion through examination of copper alloy piping and piping components exposed to treated water.

W 28-8

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of NUREG-1801

Item Number	Component/Commodity	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-94	Stainless steel and nickel alloy piping, piping components, and piping elements exposed to air – indoor uncontrolled (external)	None	None	NA - No AEM or AMP	Consistent with NUREG-1801. No aging effects requiring management are identified for stainless steel piping, piping components, and piping elements in the auxiliary systems that are exposed to air-indoor uncontrolled (external). Insert: "heat exchanger components," This item is also applied to stainless steel accumulators, bolting, drain pans, duct, screens, and tanks that are exposed to air-indoor uncontrolled (external). A Note C is applied.
3.3.1-95	Steel and aluminum piping, piping components, and piping elements exposed to air – indoor controlled (external)	None	None	NA - No AEM or AMP	Not applicable. There are no steel or aluminum piping, piping components, or piping elements in the auxiliary systems that are exposed to air-indoor controlled (external). All air-indoor environments were conservatively evaluated as uncontrolled environments.

W 28-9

Table 3.3.2-44 Aging Management Review Results – Traversing Incore Probe System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
10	Piping	Structural integrity	Stainless Steel	Air-indoor uncontrolled (Internal)	None	None	VII.J-15	3.3.1-94	A 0306
11	Piping	Structural integrity	Stainless Steel	Gas (Internal)	None	None	VII.J-19	3.3.1-97	A
12	Piping	Structural integrity	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A
13	Valve Body	Pressure boundary	Stainless Steel	Air-indoor uncontrolled (Internal)	None	None	VII.J-15	3.3.1-94	A 0306
14	Valve Body	Pressure boundary	Stainless Steel	Gas (Internal)	None	None	VII.J-19	3.3.1-97	A
15	Valve Body	Pressure boundary	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A
16	Valve Body	Structural integrity	Stainless Steel	Air-indoor uncontrolled (Internal)	None	None	VII.J-15	3.3.1-94	A 0306
17	Valve Body	Structural integrity	Stainless Steel	Gas (Internal)	None	None	VII.J-19	3.3.1-97	A
18	Valve Body	Structural integrity	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A

Insert new LRA Tables 3.3.2-45, 3.3.2-46, and 3.3.2-47 after this page

Amendment 1

W 28-9

Table 3.3.2-45 Aging Management Review Results – Heating Steam System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
1	Bolting	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	Bolting Integrity	VII.I-4	3.3.1-43	B
2	Bolting	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of pre-load	Bolting Integrity	VII.I-5	3.3.1-45	B
3	Heat Exchanger (header) (WOA-HC-1)	Structural integrity	Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
4	Heat Exchanger (header) (WOA-HC-1)	Structural integrity	Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
5	Heat Exchanger (header) (WOA-HC-1)	Structural integrity	Steel	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
6	Heat Exchanger (header) (WOA-HC-1)	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
7	Heat Exchanger (header) (WRA-SUH-4, 5, 6)	Structural integrity	Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
8	Heat Exchanger (header) (WRA-SUH-4, 5, 6)	Structural integrity	Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G

Table 3.3.2-45 Aging Management Review Results – Heating Steam System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
9	Heat Exchanger (header) (WRA-SUH-4, 5, 6)	Structural integrity	Steel	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
10	Heat Exchanger (header) (WRA-SUH-4, 5, 6)	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
11	Heat Exchanger (tubes) (WOA-HC-1)	Structural integrity	Copper Alloy	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
12	Heat Exchanger (tubes) (WOA-HC-1)	Structural integrity	Copper Alloy	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
13	Heat Exchanger (tubes) (WOA-HC-1)	Structural integrity	Copper Alloy	Air-indoor uncontrolled (External)	None	None	N/A	N/A	G
14	Heat Exchanger (tubes) (WRA-SUH-1, 3, 4, 5)	Structural integrity	Stainless Steel	Steam (Internal)	Cracking	BWR Water Chemistry	N/A	N/A	G
15	Heat Exchanger (tubes) (WRA-SUH-1, 3, 4, 5)	Structural integrity	Stainless Steel	Steam (Internal)	Cracking	Chemistry Program Effectiveness Inspection	N/A	N/A	G

W 28-9

Table 3.3.2-45 Aging Management Review Results – Heating Steam System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
16	Heat Exchanger (tubes) (WRA-SUH-1, 3, 4, 5)	Structural integrity	Stainless Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
17	Heat Exchanger (tubes) (WRA-SUH-1, 3, 4, 5)	Structural integrity	Stainless Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
18	Heat Exchanger (tubes) (WRA-SUH-1, 3, 4, 5)	Structural integrity	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	C
19	Humidifier (WMA-HU-6, WOA-HU-4, 5, 9)	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
20	Humidifier (WMA-HU-6, WOA-HU-4, 5, 9)	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Chemistry Program Effectiveness	N/A	N/A	G
21	Humidifier (WMA-HU-6, WOA-HU-4, 5, 9)	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
22	Humidifier (WMA-HU-6, WOA-HU-4, 5, 9)	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Selective Leaching Inspection	N/A	N/A	G

W 28-9

Table 3.3.2-45 Aging Management Review Results – Heating Steam System									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
23	Humidifier (WMA-HU-6, WOA-HU-4, 5, 9)	Structural integrity	Gray Cast Iron	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
24	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
25	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
26	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
27	Piping	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
28	Strainer (body)	Structural integrity	Copper Alloy	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
29	Strainer (body)	Structural integrity	Copper Alloy	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
30	Strainer (body)	Structural integrity	Copper Alloy	Air-indoor uncontrolled (External)	None	None	N/A	N/A	G
31	Trap Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G

W28-9

Table 3.3.2-45 Aging Management Review Results – Heating Steam System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
32	Trap Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
33	Trap Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
34	Trap Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Selective Leaching Inspection	N/A	N/A	G
35	Trap Body	Structural integrity	Gray Cast Iron	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
36	Tubing	Structural integrity	Stainless Steel	Steam (Internal)	Cracking	BWR Water Chemistry	N/A	N/A	G
37	Tubing	Structural integrity	Stainless Steel	Steam (Internal)	Cracking	Chemistry Program Effectiveness Inspection	N/A	N/A	G
38	Tubing	Structural integrity	Stainless Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
39	Tubing	Structural integrity	Stainless Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
40	Tubing	Structural integrity	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A

W 28-9

Table 3.3.2-45 Aging Management Review Results – Heating Steam System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
41	Valve Body	Structural integrity	Copper Alloy	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
42	Valve Body	Structural integrity	Copper Alloy	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
43	Valve Body	Structural integrity	Copper Alloy	Air-indoor uncontrolled (External)	None	None	N/A	N/A	G
44	Valve Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
45	Valve Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
46	Valve Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
47	Valve Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Selective Leaching Inspection	N/A	N/A	G
48	Valve Body	Structural integrity	Gray Cast Iron	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
49	Valve Body	Structural integrity	Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G

W 28-9

Table 3.3.2-45 Aging Management Review Results – Heating Steam System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
50	Valve Body	Structural integrity	Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
51	Valve Body	Structural integrity	Steel	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
52	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A

inspection includes a visual examination and hardness measurement, or NRC approved alternative, of a sample set of components to determine whether selective leaching is occurring or is likely to occur in the period of extended operation.

The aging management activity is credited for the following systems:

- Auxiliary Steam (AS) System
- Circulating Water (CW) System
- Containment Nitrogen (CN) System
- Control Rod Drive (CRD) System
- Diesel Building HVAC Systems (DMA)
- Diesel Fuel Oil (DO) System
- Fire Protection (FP) System
- High Pressure Core Spray (HPCS) System
- Low Pressure Core Spray (LPCS) System
- Main Steam (MS) System
- Plant Service Water (TSW) System
- Potable Cold Water (PWC) System
- Potable Hot Water (PWH) System
- Process Sampling (PS) System
- Radwaste Building Chilled Water (WCH) System
- Radwaste Building HVAC Systems (WEA, WMA, WOA, WRA)
- Reactor Building HVAC Systems (REA, ROA, RRA)
- Residual Heat Removal (RHR) System
- Standby Service Water (SW) System
- Tower Makeup Water (TMU) System

Insert:
"Heating Steam (HS) System
Heating Steam Condensate (HCO) System"

- Preventive Actions
  No actions are taken as part of the Selective Leaching Inspection to prevent aging effects or to mitigate aging degradation. Although the control of water chemistry may reduce selective leaching in treated water environments, no specific credit is taken for water chemistry control as part of this program.

W 29-1

Table 2.2-1 License Renewal Scoping Results for Mechanical Systems (continued)		
System Name	**In Scope?**	**Screening Results Section**
Floor Drain Radioactive	Yes	2.3.3.24
Fuel Oil	Yes	2.3.3.18
Fuel Pool Cooling	Yes	2.3.3.25
Glycol	No	
Guard House Exhaust Air	No	
Guard House Fire Protection	No	
Guard House Mixed Air	No	
Guard House Outside Air	No	
Guard House Potable Hot Water	No	
Guard House Return Air	No	
Heater Drain	No	
Heater Vents	No	
Heating Hot Water	No	
Heating Steam	Yes ~~No~~	2.3.3.48
Heating Steam Condensate	Yes ~~No~~	2.3.3.49
Heating Steam Vent	Yes ~~No~~	2.3.3.50
High-Pressure Core Spray	Yes	2.3.2.3
Hydrogen	No	
Hydrogen Water Chemistry	No	
Independent Spent Fuel Storage Installation	No	
Instrument Rack	Yes	2.3.3.40
Isophase Bus Duct Cooling	No	
Laboratory Equipment (Permanent Plant)	No	
Leak Detection	Yes	2.3.3.26
Local Power Range Monitor	Yes	2.3.1.2
Low-Pressure Core Spray	Yes	2.3.2.4
Machine Shop Equipment	No	
Main Steam	Yes	2.3.4.4

W 29-2

Leak Detection (LD) System (Section 2.3.3.26)

Miscellaneous Waste Radioactive (MWR) System (Section 2.3.3.27)

Plant Sanitary Drains (PSD) System (Section 2.3.3.28)

Plant Service Water (TSW) System (Section 2.3.3.29)

Potable Cold Water (PWC) System (Section 2.3.3.30)

Potable Hot Water (PWH) System (Section 2.3.3.31)

Primary Containment (C) System (Section 2.3.3.32)

Process Sampling (PS) System (Section 2.3.3.33)

Process Sampling Radioactive (PSR) System (Section 2.3.3.34)

Pump House HVAC Systems (Section 2.3.3.35)

Radwaste Building Chilled Water (WCH) System (Section 2.3.3.36)

Radwaste Building HVAC Systems (Section 2.3.3.37)

Reactor Building HVAC Systems (Section 2.3.3.38)

Reactor Closed Cooling Water (RCC) System (Section 2.3.3.39)

Reactor Protection System (RPS) (Section 2.3.3.40)

Reactor Water Cleanup (RWCU) System (Section 2.3.3.41)

Service Air (SA) System (Section 2.3.3.42)

Standby Liquid Control (SLC) System (Section 2.3.3.43)

Standby Service Water (SW) System (Section 2.3.3.44)

Suppression Pool Temperature Monitoring (SPTM) System (Section 2.3.3.45)

Tower Makeup Water (TMU) System (Section 2.3.3.46)

Traversing Incore Probe (TIP) System (Section 2.3.3.47)

A brief system description, reason for scope determination, associated FSAR references, associated license renewal drawings, and components subject to AMR information are provided for each system.

Insert:
"Heating Steam (HS) System (Section 2.3.3.48)
Heating Steam Condensate (HCO) System (Section 2.3.3.49)
Heating Steam Vent (HSV) System (Section 2.3.3.50)"

W 29-3

Table 2.3.3-44
Traversing Incore Probe System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Bolting	Pressure Boundary Structural Integrity
Chamber shield	Structural Integrity
Piping	Pressure Boundary Structural Integrity
Valve body	Pressure Boundary Structural Integrity

Insert pages 2.3-162a through 2.3-162f following this page.

W 29-3

2.3.3.49 Heating Steam Condensate System

System Description

The condensate of the Heating Steam Condensate (HCO) System originates from the HS System and is returned to the auxiliary boiler condensate return tank located in the auxiliary boiler room of the Turbine Generator Building. Condensate from the Reactor Building, Turbine Generator Building, and upper level of the Service Building is returned to the auxiliary condensate return tank by gravity.

In the Radwaste Building and lower level of the Service Building, the condensate returns are below the level of the auxiliary condensate return tank. A condensate pump-set is, therefore, provided in each of these areas to pump the condensate to the return tank.

Reason for Scope Determination

The HCO System does not perform any safety-related system intended functions that meet the scoping criteria of 10 CFR 54.4(a)(1).

The HCO System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The HCO System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the HCO System meets the scoping criteria of 10 CFR 54.4(a)(2).

The HCO System is not relied upon to demonstrate compliance with the 10 CFR 54.4(a)(3) scoping criteria for any regulated events.

FSAR References

Section 9.4.16.2 of the FSAR describes the Heating Steam Condensate System.

License Renewal Drawings

The following license renewal drawing depicts the evaluation boundaries for the system components within the scope of license renewal:

LR-M514-1

Components Subject to AMR

Table 2.3.3-46 lists the component types that require AMR and their intended functions.

Table 3.3.2-46, Aging Management Review Results – Heating Steam Condensate System, provides the results of the AMR.

W 29-3

Table 2.3.3-46
Heating Steam Condensate System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Bolting	Structural integrity
Piping	Structural integrity
Pump casing	Structural integrity
Strainer (body)	Structural integrity
Tank	Structural integrity
Trap body	Structural integrity
Tubing	Structural integrity
Valve body	Structural integrity

W 29-4

- Fire Protection System (Section 2.3.3.22)
- Floor Drain System (Section 2.3.3.23)
- Floor Drain Radioactive System (Section 2.3.3.24)
- Fuel Pool Cooling System (Section 2.3.3.25)
- Miscellaneous Waste Radioactive System (Section 2.3.3.27)
- Plant Sanitary Drains System (Section 2.3.3.28)
- Plant Service Water System (Section 2.3.3.29)
- Potable Cold Water System (Section 2.3.3.30)
- Potable Hot Water System (Section 2.3.3.31)
- Primary Containment System (Section 2.3.3.32)
- Process Sampling System (Section 2.3.3.33)
- Process Sampling Radioactive System (Section 2.3.3.34)
- Pump House HVAC Systems (Section 2.3.3.35)
- Radwaste Building Chilled Water System (Section 2.3.3.36)
- Radwaste Building HVAC Systems (Section 2.3.3.37)
- Reactor Building HVAC Systems (Section 2.3.3.38)
- Reactor Closed Cooling Water System (Section 2.3.3.39)
- Reactor Water Cleanup System (Section 2.3.3.41)
- Service Air System (Section 2.3.3.42)
- Standby Liquid Control System (Section 2.3.3.43)
- Standby Service Water System (Section 2.3.3.44)
- Tower Makeup Water System (Section 2.3.3.46)
- Traversing Incore Probe System (Section 2.3.3.47)

Add Insert A from page 3.3-2a

Table 3.3.1, Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of NUREG-1801, provides the summary of the programs evaluated in NUREG-1801 that are applicable to component and commodity groups in this section. Text addressing summary items requiring further evaluation is provided in Section 3.3.2.2.

W 29-4

Insert A to LRA Section 3.3.1

- Heating Steam System (Section 2.3.3.48)
- Heating Steam Condensate System (Section 2.3.3.49)
- Heating Steam Vent System (Section 2.3.3.50)

Table 3.3.2-39 Aging Management Review Results – Reactor Water Cleanup System

Table 3.3.2-40 Aging Management Review Results – Service Air System

Table 3.3.2-41 Aging Management Review Results – Standby Liquid Control System

Table 3.3.2-42 Aging Management Review Results – Standby Service Water System

Table 3.3.2-43 Aging Management Review Results – Tower Makeup Water System

Table 3.3.2-44 Aging Management Review Results – Traversing Incore Probe System

Add Insert A from page 3.3-5a

3.3.2.1 Materials, Environments, Aging Effects Requiring Management, and Aging Management Programs

The materials from which specific components and commodities are fabricated, the environments to which they are exposed, the aging effects requiring management, and the aging management programs used to manage these aging effects are provided for each of the above systems in the following sections.

3.3.2.1.1 Circulating Water System

Materials

The materials of construction for subject mechanical components of the Circulating Water System are:

- Concrete
- Gray cast iron
- Stainless steel
- Steel

Environments

Subject mechanical components of the Circulating Water System are exposed to the following normal operating environments:

- Air-outdoor
- Raw water
- Soil

W 29-5

Insert A to LRA Section 3.3.2

Table 3.3.2-45 Aging Management Review Results – Heating Steam System

Table 3.3.2-46 Aging Management Review Results – Heating Steam Condensate System

Table 3.3.2-47 Aging Management Review Results – Heating Steam Vent System

W 29-6

- External Surfaces Monitoring Program

Add new sections 3.3.2.1.45 through 47 as shown on pages 3.3-50a through d

3.3.2.2 Further Evaluation of Aging Management as Recommended by NUREG-1801

For the Auxiliary Systems, those items requiring further evaluation are addressed in the following sections.

3.3.2.2.1 Cumulative Fatigue Damage

Fatigue is a time-limited aging analysis, as defined in 10 CFR 54.3. Time-limited aging analyses are required to be evaluated in accordance with 10 CFR 54.21(c). Time-limited aging analyses identified for fatigue in the Auxiliary Systems are evaluated in Section 4.3.4.

3.3.2.2.2 Reduction of Heat Transfer due to Fouling

As described in Table 3.3.1, the Fuel Pool Cooling System has stainless steel heat exchanger tubes in treated water which are evaluated under item number 3.3.1-03. Fouling of stainless steel heat exchanger tubes in treated water is managed by the BWR Water Chemistry Program, in conjunction with the Heat Exchangers Inspection.

3.3.2.2.3 Cracking due to Stress Corrosion Cracking (SCC)

3.3.2.2.3.1 BWR Standby Liquid Control System

The treated water environment for the Standby Liquid Control System uses an aqueous solution of sodium pentaborate decahydrate. The system is normally in standby with the fluid temperature maintained above the 60°F saturation temperature in an area where the ambient temperature is less than 100°F during normal plant operation. Since the temperature is below 140°F during normal plant operation, cracking due to SCC is not an aging effect requiring management for the stainless steel components of the Standby Liquid Control System.

3.3.2.2.3.2 Heat Exchanger Components

As described in Table 3.3.1, there are no components compared to item number 3.3.1-05. The Reactor Water Cleanup regenerative and non-regenerative heat exchangers at Columbia have no stainless steel components subject to AMR. Therefore, cracking of these components due to stress corrosion cracking is not an aging effect requiring management. Refer to item 3.3.1-48 (no further evaluation required) for the aging effects that do require management for these components.

3.3.2.2.3.3 Diesel Engine Exhaust Piping, Piping Components, and Piping Elements

During normal plant operations, diesel exhaust piping, piping components, and piping elements are exposed to diesel exhaust infrequently and for short durations. For the remaining time, these components are exposed internally to outdoor air. As such, temperatures above 140°F occur only infrequently and for short durations. Therefore, cracking due to SCC is not identified as an aging effect requiring management for

3.3.2.1.45 Heating Steam System

Materials

The materials of construction for subject mechanical components of the Heating Steam System are:

- Copper alloy
- Gray cast iron
- Stainless steel
- Steel

Environments

Subject mechanical components of the Heating Steam System are exposed to the following normal operating environments:

- Air-indoor uncontrolled
- Steam

Aging Effects Requiring Management

The following aging effects require management for the subject mechanical components of the Heating Steam System:

- Cracking
- Loss of material
- Loss of pre-load

Aging Management Programs

The following aging management programs manage the aging effects for subject mechanical components of the Heating Steam System:

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- External Surfaces Monitoring Program

W 29-6

- Flow-Accelerated Corrosion (FAC) Program
- Selective Leaching Inspection

3.3.2.1.46 Heating Steam Condensate System

Materials

The materials of construction for subject mechanical components of the Heating Steam Condensate System are:

- Copper alloy
- Gray cast iron
- Steel

Environments

Subject mechanical components of the Heating Steam Condensate System are exposed to the following normal operating environments:

- Air-indoor uncontrolled
- Moist Air
- Steam
- Treated water > 60 °C (140 °F)

Aging Effects Requiring Management

The following aging effects require management for the subject mechanical components of the Heating Steam Condensate System:

- Loss of material
- Loss of pre-load

Aging Management Programs

The following aging management programs manage the aging effects for subject mechanical components of the Heating Steam Condensate System:

- Bolting Integrity Program

W 29-7

an aggressive environment. Therefore, loss of material due to pitting and crevice corrosion is not an aging effect requiring management for these components.

3.3.2.2.10.7 Stainless Steel Piping, Piping Components, and Piping Elements - Soil

~~As described in Table 3.3.1, there are no components compared to item number 3.3.1-29. There is no stainless steel piping subject to AMR for Columbia that is exposed to soil in the Auxiliary systems.~~ Replace with Insert A on page 3.3-55a

3.3.2.2.10.8 BWR Standby Liquid Control System

Loss of material due to pitting and crevice corrosion for stainless steel piping components and tanks exposed to sodium pentaborate solution is managed by the BWR Water Chemistry Program. The BWR Water Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a verification of the effectiveness of the BWR Water Chemistry Program to manage loss of material due to pitting and crevice corrosion through examination of stainless steel piping components and tanks exposed to sodium pentaborate solution.

Replace with Insert B from page 3.3-55a

3.3.2.2.11 Loss of Material due to Pitting, Crevice, and Galvanic Corrosion

~~As described in Table 3.3.1, there were no components compared to item number 3.3.1-31. There are no copper alloy piping, piping components, or piping elements in the Auxiliary systems that are exposed to treated water.~~

3.3.2.2.12 Loss of Material due to Pitting, Crevice, and Microbiologically Influenced Corrosion

3.3.2.2.12.1 Piping, Piping Components, and Piping Elements – Fuel Oil

There are no aluminum piping components exposed to fuel oil that are subject to AMR.

Loss of material due to pitting and crevice corrosion and MIC for stainless steel and copper alloy piping components exposed to fuel oil is managed by the Fuel Oil Chemistry Program. The Fuel Oil Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a verification of the effectiveness of the Fuel Oil Chemistry Program to manage loss of material through examination of piping and components exposed to fuel oil.

3.3.2.2.12.2 Piping, Piping Components, and Piping Elements – Lubricating Oil

Loss of material due to pitting and crevice corrosion and MIC for stainless steel piping components and heat exchanger components exposed to lubricating oil is managed by the Lubricating Oil Analysis Program. The Lubricating Oil Analysis Program manages aging effects through periodic monitoring and control of contaminants, including water. The Lubricating Oil Inspection will provide a verification of the effectiveness of the

W 29-7

Insert A to LRA Section 3.3.2.2.10.7

The Buried Piping Thanks Inspection Program, with enhancement, manages loss of material due to pitting and crevice corrosion and microbiologically influenced corrosion (MIC) for stainless steel piping and piping components buried in soil.

Insert B to LRA Section 3.3.2.2.11

Loss of material due to pitting, crevice, and galvanic corrosion for copper alloy piping, piping components, or piping elements exposed to treated water is managed by the BWR Water Chemistry Program. The BWR Water Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a verification of the effectiveness of the BWR Water Chemistry Program to manage loss of material due to pitting, crevice, and galvanic corrosion through examination of copper alloy piping and piping components exposed to treated water.

W 29-8

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of NUREG-1801

Item Number	Component/Commodity	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-31	Copper alloy piping, piping components, and piping elements exposed to treated water	Loss of material due to pitting, crevice, and galvanic corrosion	Water Chemistry and One-Time Inspection Replace discussion with Insert A from page 3.3-77a	Yes, detection of aging effects is to be evaluated	~~Not applicable~~. ~~There are no copper alloy piping, piping components, or piping elements in the auxiliary systems that are exposed to treated water.~~ ~~Refer to Section 3.3.2.2.11 for further information~~.
3.3.1-32	Stainless steel, aluminum and copper alloy piping, piping components, and piping elements exposed to fuel oil	Loss of material due to pitting, crevice, and microbiologically influenced corrosion	Fuel Oil Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801, with exceptions. The Fuel Oil Chemistry Program, in conjunction with the Chemistry Program Effectiveness Inspection, is credited to manage loss of material for stainless steel and copper alloy piping and piping components in the auxiliary systems that are exposed to fuel oil. There are no aluminum piping, piping components, or piping elements in the auxiliary systems that are exposed to fuel oil. Refer to Section 3.3.2.2.12.1 for further information.

Amendment 1

W 29-8

Insert A to LRA Table 3.3.1 Item 3.3.1-31

Consistent with NUREG-1801.

The BWR Water Chemistry Program, in conjunction with the Chemistry Program Effectiveness Inspection, is credited to manage loss of material for copper alloy piping and piping components in the auxiliary systems that are exposed to treated water.

Refer to Section 3.3.2.2.11 for further information.

W 29-9

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of NUREG-1801

Item Number	Component/Commodity	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-71	Steel piping, piping components, and piping elements exposed to moist air or condensation (Internal)	Loss of material due to general, pitting, and crevice corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Replace deleted text with Insert A from page 33-101a	No	The following programs are credited to manage loss of material for steel piping, piping components, and tanks in the auxiliary systems that are exposed to moist air or condensation (internal): • Cooling Units Inspection for drain piping in HVAC systems exposed to condensation (internal) • Monitoring and Collection Systems Inspection for air-water interfaces in Plant Sanitary Drain System piping evaluated as exposed to moist air (internal) • ~~Supplemental Piping/Tank Inspection for air-water interfaces in piping and tanks evaluated as exposed to moist air (internal)~~ A Note E is applied in each case.

Amendment 1

W29-9

Insert A to LRA Table 3.3.1 Item 3.3.1-71

- Supplemental Piping/Tank Inspection for air-water interfaces in piping, piping components, and tanks evaluated as exposed to moist air (internal)

W 29-10

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of NUREG-1801

Item Number	Component/Commodity	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-85	Gray cast iron piping, piping components, and piping elements exposed to soil, raw water, treated water or closed-cycle cooling water	Loss of material due to selective leaching	Selective Leaching of Materials	No	Consistent with NUREG-1801. The Selective Leaching Inspection is credited to detect and characterize loss of material due to selective leaching for gray cast iron piping, piping components, and piping elements in the auxiliary systems exposed to soil, raw water, and closed-cycle cooling water. Insert: "treated water" This item is also applied to gray cast iron heat exchanger components that are exposed to raw water and closed cycle cooling water, and to gray cast iron tank components exposed to raw water. A Note C is applied.
3.3.1-86	Structural steel (new fuel storage rack assembly) exposed to air – indoor uncontrolled (external)	Loss of material due to general, pitting, and crevice corrosion	Structures Monitoring Program	No	Not applicable. There is no structural steel (new fuel storage rack assembly) exposed to air-indoor uncontrolled (external).
3.3.1-87	PWR Only				
3.3.1-88	PWR Only				
3.3.1-89	PWR Only				

Amendment 1

W 29-11

Table 3.3.2-44 Aging Management Review Results – Traversing Incore Probe System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
10	Piping	Structural integrity	Stainless Steel	Air-indoor uncontrolled (Internal)	None	None	VII.J-15	3.3.1-94	A 0306
11	Piping	Structural integrity	Stainless Steel	Gas (Internal)	None	None	VII.J-19	3.3.1-97	A
12	Piping	Structural integrity	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A
13	Valve Body	Pressure boundary	Stainless Steel	Air-indoor uncontrolled (Internal)	None	None	VII.J-15	3.3.1-94	A 0306
14	Valve Body	Pressure boundary	Stainless Steel	Gas (Internal)	None	None	VII.J-19	3.3.1-97	A
15	Valve Body	Pressure boundary	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A
16	Valve Body	Structural integrity	Stainless Steel	Air-indoor uncontrolled (Internal)	None	None	VII.J-15	3.3.1-94	A 0306
17	Valve Body	Structural integrity	Stainless Steel	Gas (Internal)	None	None	VII.J-19	3.3.1-97	A
18	Valve Body	Structural integrity	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A

Insert new LRA Tables 3.3.2-45, 3.3.2-46, and 3.3.2-47 after this page

Amendment 1

W29-11

Table 3.3.2-46 Aging Management Review Results – Heating Steam Condensate System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
1	Bolting	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	Bolting Integrity	VII.I-4	3.3.1-43	B
2	Bolting	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of pre-load	Bolting Integrity	VII.I-5	3.3.1-45	B
3	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
4	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
5	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
6	Piping	Structural integrity	Steel	Treated water > 60 °C (140 °F) (Internal)	Loss of material	BWR Water Chemistry	VII.E3-18	3.3.1-17	A 0305
7	Piping	Structural integrity	Steel	Treated water > 60 °C (140 °F) (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VII.E3-18	3.3.1-17	A 0305
8	Piping	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
9	Pump Casing (WHCO-P-1A, 1B)	Structural integrity	Gray Cast Iron	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	C 0302

W 29-11

Table 3.3.2-46 Aging Management Review Results – Heating Steam Condensate System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
10	Pump Casing (WHCO-P-1A, 1B)	Structural integrity	Gray Cast Iron	Moist air (Internal)	Loss of material	Supplemental Piping/Tank Inspection	VII.H2-21	3.3.1-71	E 0303
11	Pump Casing (WHCO-P-1A, 1B)	Structural integrity	Gray Cast Iron	Treated water > 60 °C (140 °F) (Internal)	Loss of material	BWR Water Chemistry	VII.E3-18	3.3.1-17	A 0305
12	Pump Casing (WHCO-P-1A, 1B)	Structural integrity	Gray Cast Iron	Treated water > 60 °C (140 °F) (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VII.E3-18	3.3.1-17	A 0305
13	Pump Casing (WHCO-P-1A, 1B)	Structural integrity	Gray Cast Iron	Treated water > 60 °C (140 °F) (Internal)	Loss of material	Selective Leaching Inspection	VII.E3-12	3.3.1-85	A 0305
14	Pump Casing (WHCO-P-1A, 1B)	Structural integrity	Gray Cast Iron	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
15	Strainer (body)	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
16	Strainer (body)	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
17	Strainer (body)	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
18	Strainer (body)	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Selective Leaching Inspection	N/A	N/A	G

W 29-11

Table 3.3.2-46 Aging Management Review Results – Heating Steam Condensate System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
19	Strainer (body)	Structural integrity	Gray Cast Iron	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
20	Tank (WHCO-CU-1)	Structural integrity	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	C 0302
21	Tank (WHCO-CU-1)	Structural integrity	Steel	Moist air (Internal)	Loss of material	Supplemental Piping/Tank Inspection	VII.H2-21	3.3.1-71	E 0303
22	Tank (WHCO-CU-1)	Structural integrity	Steel	Treated water > 60 °C (140 °F) (Internal)	Loss of material	BWR Water Chemistry	VII.E3-18	3.3.1-17	C 0305
23	Tank (WHCO-CU-1)	Structural integrity	Steel	Treated water > 60 °C (140 °F) (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VII.E3-18	3.3.1-17	C 0305
24	Tank (WHCO-CU-1)	Structural integrity	Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
25	Tank (WHCO-CU-1)	Structural integrity	Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
26	Tank (WHCO-CU-1)	Structural integrity	Steel	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
27	Tank (WHCO-CU-1)	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A

W 29-11

Table 3.3.2-46 Aging Management Review Results – Heating Steam Condensate System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
28	Trap Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
29	Trap Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
30	Trap Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
31	Trap Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Selective Leaching Inspection	N/A	N/A	G
32	Trap Body	Structural integrity	Gray Cast Iron	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
33	Tubing	Structural integrity	Copper Alloy	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
34	Tubing	Structural integrity	Copper Alloy	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
35	Tubing	Structural integrity	Copper Alloy	Treated water > 60 °C (140 °F) (Internal)	Loss of material	BWR Water Chemistry	VII.E3-9	3.3.1-31	A 0305
36	Tubing	Structural integrity	Copper Alloy	Treated water > 60 °C (140 °F) (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VII.E3-9	3.3.1-31	A 0305

Table 3.3.2-46 Aging Management Review Results – Heating Steam Condensate System									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
37	Tubing	Structural integrity	Copper Alloy	Air-indoor uncontrolled (External)	None	None	N/A	N/A	G
38	Valve Body	Structural integrity	Copper Alloy	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
39	Valve Body	Structural integrity	Copper Alloy	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
40	Valve Body	Structural integrity	Copper Alloy	Treated water > 60 °C (140 °F) (Internal)	Loss of material	BWR Water Chemistry	VII.E3-9	3.3.1-31	A 0305
41	Valve Body	Structural integrity	Copper Alloy	Treated water > 60 °C (140 °F) (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VII.E3-9	3.3.1-31	A 0305
42	Valve Body	Structural integrity	Copper Alloy	Air-indoor uncontrolled (External)	None	None	N/A	N/A	G
43	Valve Body	Structural integrity	Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
44	Valve Body	Structural integrity	Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
45	Valve Body	Structural integrity	Steel	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G

W 29-11

Table 3.3.2-46 Aging Management Review Results – Heating Steam Condensate System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
46	Valve Body	Structural integrity	Steel	Treated water > 60 °C (140 °F) (Internal)	Loss of material	BWR Water Chemistry	VII.E3-18	3.3.1-17	A 0305
47	Valve Body	Structural integrity	Steel	Treated water > 60 °C (140 °F) (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VII.E3-18	3.3.1-17	A 0305
48	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A

W 29-12

inspection includes a visual examination and hardness measurement, or NRC approved alternative, of a sample set of components to determine whether selective leaching is occurring or is likely to occur in the period of extended operation.

The aging management activity is credited for the following systems:

- Auxiliary Steam (AS) System
- Circulating Water (CW) System
- Containment Nitrogen (CN) System
- Control Rod Drive (CRD) System
- Diesel Building HVAC Systems (DMA)
- Diesel Fuel Oil (DO) System
- Fire Protection (FP) System

Insert:
"Heating Steam (HS) System
Heating Steam Condensate (HCO) System"

- High Pressure Core Spray (HPCS) System
- Low Pressure Core Spray (LPCS) System
- Main Steam (MS) System
- Plant Service Water (TSW) System
- Potable Cold Water (PWC) System
- Potable Hot Water (PWH) System
- Process Sampling (PS) System
- Radwaste Building Chilled Water (WCH) System
- Radwaste Building HVAC Systems (WEA, WMA, WOA, WRA)
- Reactor Building HVAC Systems (REA, ROA, RRA)
- Residual Heat Removal (RHR) System
- Standby Service Water (SW) System
- Tower Makeup Water (TMU) System

- Preventive Actions
  No actions are taken as part of the Selective Leaching Inspection to prevent aging effects or to mitigate aging degradation. Although the control of water chemistry may reduce selective leaching in treated water environments, no specific credit is taken for water chemistry control as part of this program.

W 29-13

- Fire Protection (FP) System
- Floor Drain (FD) System
- Floor Drain Radioactive (FDR) System
- Fuel Pool Cooling (FPC) System
- High Pressure Core Spray (HPCS) System
- Low Pressure Core Spray (LPCS) System
- Main Steam (MS) System
- Miscellaneous Drain (MD) System
- Process Sampling Radioactive (PSR) System
- Reactor Building Outside Air (ROA) System
- Reactor Closed Cooling Water (RCC) System
- Reactor Core Isolation Cooling (RCIC) System
- Residual Heat Removal (RHR) System
- Standby Liquid Control (SLC) System
- Standby Service Water (SW) System
- Tower Makeup Water (TMU) System

Add:
Heating Steam Condensate (HCO) System

A representative sample of components at susceptible locations will be examined for evidence of loss of material (due to crevice, galvanic, general, or pitting corrosion, or MIC), or to confirm a lack thereof.

The Supplemental Piping/Tank Inspection focuses on a limited but representative sample population of subject components at susceptible locations to be defined in the implementing documents, to include external piping surfaces and internal tank and piping surfaces at air-water interfaces. The inspections provide symptomatic evidence of loss of material at the other susceptible, but possibly inaccessible, locations (such as internal surfaces of piping) due to the similarities in materials and environmental conditions.

- Preventive Actions
  No actions are taken as part of the Supplemental Piping/Tank Inspection to prevent aging effects or to mitigate aging degradation.

- Parameters Monitored or Inspected
  The parameters to be inspected by the Supplemental Piping/Tank Inspection include wall thickness or visual evidence of internal and external surface degradation, as measures of loss of material. Inspections will be performed by qualified personnel

Amendment 1

W 30-1

Table 2.2-1
License Renewal Scoping Results for Mechanical Systems (continued)

System Name	In Scope?	Screening Results Section
Floor Drain Radioactive	Yes	2.3.3.24
Fuel Oil	Yes	2.3.3.18
Fuel Pool Cooling	Yes	2.3.3.25
Glycol	No	
Guard House Exhaust Air	No	
Guard House Fire Protection	No	
Guard House Mixed Air	No	
Guard House Outside Air	No	
Guard House Potable Hot Water	No	
Guard House Return Air	No	
Heater Drain	No	
Heater Vents	No	
Heating Hot Water	No	
Heating Steam	Yes ~~No~~	2.3.3.48
Heating Steam Condensate	Yes ~~No~~	2.3.3.49
Heating Steam Vent	Yes ~~No~~	2.3.3.50
High-Pressure Core Spray	Yes	2.3.2.3
Hydrogen	No	
Hydrogen Water Chemistry	No	
Independent Spent Fuel Storage Installation	No	
Instrument Rack	Yes	2.3.3.40
Isophase Bus Duct Cooling	No	
Laboratory Equipment (Permanent Plant)	No	
Leak Detection	Yes	2.3.3.26
Local Power Range Monitor	Yes	2.3.1.2
Low-Pressure Core Spray	Yes	2.3.2.4
Machine Shop Equipment	No	
Main Steam	Yes	2.3.4.4

W 30-2

Leak Detection (LD) System (Section 2.3.3.26)

Miscellaneous Waste Radioactive (MWR) System (Section 2.3.3.27)

Plant Sanitary Drains (PSD) System (Section 2.3.3.28)

Plant Service Water (TSW) System (Section 2.3.3.29)

Potable Cold Water (PWC) System (Section 2.3.3.30)

Potable Hot Water (PWH) System (Section 2.3.3.31)

Primary Containment (C) System (Section 2.3.3.32)

Process Sampling (PS) System (Section 2.3.3.33)

Process Sampling Radioactive (PSR) System (Section 2.3.3.34)

Pump House HVAC Systems (Section 2.3.3.35)

Radwaste Building Chilled Water (WCH) System (Section 2.3.3.36)

Radwaste Building HVAC Systems (Section 2.3.3.37)

Reactor Building HVAC Systems (Section 2.3.3.38)

Reactor Closed Cooling Water (RCC) System (Section 2.3.3.39)

Reactor Protection System (RPS) (Section 2.3.3.40)

Reactor Water Cleanup (RWCU) System (Section 2.3.3.41)

Service Air (SA) System (Section 2.3.3.42)

Standby Liquid Control (SLC) System (Section 2.3.3.43)

Standby Service Water (SW) System (Section 2.3.3.44)

Suppression Pool Temperature Monitoring (SPTM) System (Section 2.3.3.45)

Tower Makeup Water (TMU) System (Section 2.3.3.46)

Traversing Incore Probe (TIP) System (Section 2.3.3.47)

A brief system description, reason for scope determination, associated FSAR references, associated license renewal drawings, and components subject to AMR information are provided for each system.

Insert:
"Heating Steam (HS) System (Section 2.3.3.48)
Heating Steam Condensate (HCO) System (Section 2.3.3.49)
Heating Steam Vent (HSV) System (Section 2.3.3.50)"

Amendment 1

W 30-3

Table 2.3.3-44
Traversing Incore Probe System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Bolting	Pressure Boundary Structural Integrity
Chamber shield	Structural Integrity
Piping	Pressure Boundary Structural Integrity
Valve body	Pressure Boundary Structural Integrity

Insert pages 2.3-162a through 2.3-162f following this page

Amendment 1

W 30-3

2.3.3.50 Heating Steam Vent System

System Description

The Heating Steam Vent (HSV) System provides a vent through the roof of the respective buildings of the relief valves and tanks of the HS and HCO systems.

Reason for Scope Determination

The HSV System does not perform any safety-related system intended functions that meet the scoping criteria of 10 CFR 54.4(a)(1).

The HSV System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The HSV System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the HSV System meets the scoping criteria of 10 CFR 54.4(a)(2).

The HSV System is not relied upon to demonstrate compliance with the 10 CFR 54.4(a)(3) scoping criteria for any regulated events.

FSAR References

Figure 9.4-9.1 of the FSAR describes the Heating Steam Vent System.

License Renewal Drawings

The following license renewal drawing depicts the evaluation boundaries for the system components within the scope of license renewal:

LR-M514-1

Components Subject to AMR

Table 2.3.3-47 lists the component types that require AMR and their intended functions.

Table 3.3.2-47, Aging Management Review Results – Heating Steam Vent System, provides the results of the AMR.

W 30-3

Table 2.3.3-47
Heating Steam Vent System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Bolting	Structural integrity
Piping	Structural integrity

W 30-4

- Fire Protection System (Section 2.3.3.22)
- Floor Drain System (Section 2.3.3.23)
- Floor Drain Radioactive System (Section 2.3.3.24)
- Fuel Pool Cooling System (Section 2.3.3.25)
- Miscellaneous Waste Radioactive System (Section 2.3.3.27)
- Plant Sanitary Drains System (Section 2.3.3.28)
- Plant Service Water System (Section 2.3.3.29)
- Potable Cold Water System (Section 2.3.3.30)
- Potable Hot Water System (Section 2.3.3.31)
- Primary Containment System (Section 2.3.3.32)
- Process Sampling System (Section 2.3.3.33)
- Process Sampling Radioactive System (Section 2.3.3.34)
- Pump House HVAC Systems (Section 2.3.3.35)
- Radwaste Building Chilled Water System (Section 2.3.3.36)
- Radwaste Building HVAC Systems (Section 2.3.3.37)
- Reactor Building HVAC Systems (Section 2.3.3.38)
- Reactor Closed Cooling Water System (Section 2.3.3.39)
- Reactor Water Cleanup System (Section 2.3.3.41)
- Service Air System (Section 2.3.3.42)
- Standby Liquid Control System (Section 2.3.3.43)
- Standby Service Water System (Section 2.3.3.44)
- Tower Makeup Water System (Section 2.3.3.46)
- Traversing Incore Probe System (Section 2.3.3.47)

Add Insert A from page 3.3-2a

Table 3.3.1, Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of NUREG-1801, provides the summary of the programs evaluated in NUREG-1801 that are applicable to component and commodity groups in this section. Text addressing summary items requiring further evaluation is provided in Section 3.3.2.2.

W 30-4

Insert A to LRA Section 3.3.1

- Heating Steam System (Section 2.3.3.48)
- Heating Steam Condensate System (Section 2.3.3.49)
- Heating Steam Vent System (Section 2.3.3.50)

W 30-5

Table 3.3.2-39 Aging Management Review Results – Reactor Water Cleanup System

Table 3.3.2-40 Aging Management Review Results – Service Air System

Table 3.3.2-41 Aging Management Review Results – Standby Liquid Control System

Table 3.3.2-42 Aging Management Review Results – Standby Service Water System

Table 3.3.2-43 Aging Management Review Results – Tower Makeup Water System

Table 3.3.2-44 Aging Management Review Results – Traversing Incore Probe System

Add Insert A from page 3.3-5a

3.3.2.1 Materials, Environments, Aging Effects Requiring Management, and Aging Management Programs

The materials from which specific components and commodities are fabricated, the environments to which they are exposed, the aging effects requiring management, and the aging management programs used to manage these aging effects are provided for each of the above systems in the following sections.

3.3.2.1.1 Circulating Water System

Materials

The materials of construction for subject mechanical components of the Circulating Water System are:

- Concrete
- Gray cast iron
- Stainless steel
- Steel

Environments

Subject mechanical components of the Circulating Water System are exposed to the following normal operating environments:

- Air-outdoor
- Raw water
- Soil

W 30-5

Insert A to LRA Section 3.3.2

Table 3.3.2-45 Aging Management Review Results – Heating Steam System

Table 3.3.2-46 Aging Management Review Results – Heating Steam Condensate System

Table 3.3.2-47 Aging Management Review Results – Heating Steam Vent System

W 30-6

- External Surfaces Monitoring Program

Add new sections 3.3.2.1.45 through 47 as shown on pages 3.3-50a through d

3.3.2.2 Further Evaluation of Aging Management as Recommended by NUREG-1801

For the Auxiliary Systems, those items requiring further evaluation are addressed in the following sections.

3.3.2.2.1 Cumulative Fatigue Damage

Fatigue is a time-limited aging analysis, as defined in 10 CFR 54.3. Time-limited aging analyses are required to be evaluated in accordance with 10 CFR 54.21(c). Time-limited aging analyses identified for fatigue in the Auxiliary Systems are evaluated in Section 4.3.4.

3.3.2.2.2 Reduction of Heat Transfer due to Fouling

As described in Table 3.3.1, the Fuel Pool Cooling System has stainless steel heat exchanger tubes in treated water which are evaluated under item number 3.3.1-03. Fouling of stainless steel heat exchanger tubes in treated water is managed by the BWR Water Chemistry Program, in conjunction with the Heat Exchangers Inspection.

3.3.2.2.3 Cracking due to Stress Corrosion Cracking (SCC)

3.3.2.2.3.1 BWR Standby Liquid Control System

The treated water environment for the Standby Liquid Control System uses an aqueous solution of sodium pentaborate decahydrate. The system is normally in standby with the fluid temperature maintained above the 60°F saturation temperature in an area where the ambient temperature is less than 100°F during normal plant operation. Since the temperature is below 140°F during normal plant operation, cracking due to SCC is not an aging effect requiring management for the stainless steel components of the Standby Liquid Control System.

3.3.2.2.3.2 Heat Exchanger Components

As described in Table 3.3.1, there are no components compared to item number 3.3.1-05. The Reactor Water Cleanup regenerative and non-regenerative heat exchangers at Columbia have no stainless steel components subject to AMR. Therefore, cracking of these components due to stress corrosion cracking is not an aging effect requiring management. Refer to item 3.3.1-48 (no further evaluation required) for the aging effects that do require management for these components.

3.3.2.2.3.3 Diesel Engine Exhaust Piping, Piping Components, and Piping Elements

During normal plant operations, diesel exhaust piping, piping components, and piping elements are exposed to diesel exhaust infrequently and for short durations. For the remaining time, these components are exposed internally to outdoor air. As such, temperatures above 140°F occur only infrequently and for short durations. Therefore, cracking due to SCC is not identified as an aging effect requiring management for

- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- External Surfaces Monitoring Program
- Flow-Accelerated Corrosion (FAC) Program
- Selective Leaching Inspection
- Supplemental Piping/Tanks Inspection

3.3.2.1.47 Heating Steam Vent System

Materials

The materials of construction for subject mechanical components of the Heating Steam Vent System are:

- Steel

Environments

Subject mechanical components of the Heating Steam Vent System are exposed to the following normal operating environments:

- Air-indoor uncontrolled
- Steam

Aging Effects Requiring Management

The following aging effects require management for the subject mechanical components of the Heating Steam Vent System:

- Loss of material
- Loss of pre-load

Aging Management Programs

The following aging management programs manage the aging effects for subject mechanical components of the Heating Steam Vent System:

- Bolting Integrity Program
- BWR Water Chemistry Program

W 30-6

- Chemistry Program Effectiveness Inspection
- External Surfaces Monitoring Program
- Flow-Accelerated Corrosion (FAC) Program

W 30-7

an aggressive environment. Therefore, loss of material due to pitting and crevice corrosion is not an aging effect requiring management for these components.

3.3.2.2.10.7 Stainless Steel Piping, Piping Components, and Piping Elements - Soil

~~As described in Table 3.3.1, there are no components compared to item number 3.3.1-29. There is no stainless steel piping subject to AMR for Columbia that is exposed to soil in the Auxiliary systems.~~ Replace with Insert A on page 3.3-55a

3.3.2.2.10.8 BWR Standby Liquid Control System

Replace with Insert B from page 3.3-55a

Loss of material due to pitting and crevice corrosion for stainless steel piping components and tanks exposed to sodium pentaborate solution is managed by the BWR Water Chemistry Program. The BWR Water Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a verification of the effectiveness of the BWR Water Chemistry Program to manage loss of material due to pitting and crevice corrosion through examination of stainless steel piping components and tanks exposed to sodium pentaborate solution.

3.3.2.2.11 Loss of Material due to Pitting, Crevice, and Galvanic Corrosion

~~As described in Table 3.3.1, there were no components compared to item number 3.3.1-31. There are no copper alloy piping, piping components, or piping elements in the Auxiliary systems that are exposed to treated water.~~

3.3.2.2.12 Loss of Material due to Pitting, Crevice, and Microbiologically Influenced Corrosion

3.3.2.2.12.1 Piping, Piping Components, and Piping Elements – Fuel Oil

There are no aluminum piping components exposed to fuel oil that are subject to AMR.

Loss of material due to pitting and crevice corrosion and MIC for stainless steel and copper alloy piping components exposed to fuel oil is managed by the Fuel Oil Chemistry Program. The Fuel Oil Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a verification of the effectiveness of the Fuel Oil Chemistry Program to manage loss of material through examination of piping and components exposed to fuel oil.

3.3.2.2.12.2 Piping, Piping Components, and Piping Elements – Lubricating Oil

Loss of material due to pitting and crevice corrosion and MIC for stainless steel piping components and heat exchanger components exposed to lubricating oil is managed by the Lubricating Oil Analysis Program. The Lubricating Oil Analysis Program manages aging effects through periodic monitoring and control of contaminants, including water. The Lubricating Oil Inspection will provide a verification of the effectiveness of the

W 30-7

Insert A to LRA Section 3.3.2.2.10.7

The Buried Piping Thanks Inspection Program, with enhancement, manages loss of material due to pitting and crevice corrosion and microbiologically influenced corrosion (MIC) for stainless steel piping and piping components buried in soil.

Insert B to LRA Section 3.3.2.2.11

Loss of material due to pitting, crevice, and galvanic corrosion for copper alloy piping, piping components, or piping elements exposed to treated water is managed by the BWR Water Chemistry Program. The BWR Water Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a verification of the effectiveness of the BWR Water Chemistry Program to manage loss of material due to pitting, crevice, and galvanic corrosion through examination of copper alloy piping and piping components exposed to treated water.

W 30-8

Table 3.3.2-44 Aging Management Review Results – Traversing Incore Probe System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
10	Piping	Structural integrity	Stainless Steel	Air-indoor uncontrolled (Internal)	None	None	VII.J-15	3.3.1-94	A 0306
11	Piping	Structural integrity	Stainless Steel	Gas (Internal)	None	None	VII.J-19	3.3.1-97	A
12	Piping	Structural integrity	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A
13	Valve Body	Pressure boundary	Stainless Steel	Air-indoor uncontrolled (Internal)	None	None	VII.J-15	3.3.1-94	A 0306
14	Valve Body	Pressure boundary	Stainless Steel	Gas (Internal)	None	None	VII.J-19	3.3.1-97	A
15	Valve Body	Pressure boundary	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A
16	Valve Body	Structural integrity	Stainless Steel	Air-indoor uncontrolled (Internal)	None	None	VII.J-15	3.3.1-94	A 0306
17	Valve Body	Structural integrity	Stainless Steel	Gas (Internal)	None	None	VII.J-19	3.3.1-97	A
18	Valve Body	Structural integrity	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A

Insert new LRA Tables 3.3.2-45, 3.3.2-46, and 3.3.2-47 after this page

Amendment 1

W 30-8

Table 3.3.2-47 Aging Management Review Results – Heating Steam Vent System									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
1	Bolting	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	Bolting Integrity	VII.I-4	3.3.1-43	B
2	Bolting	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of pre-load	Bolting Integrity	VII.I-5	3.3.1-45	B
3	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
4	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
5	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
6	Piping	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A

W 31

2.3.3.27 Miscellaneous Waste Radioactive (MWR) System

System Description

The MWR System is designed to collect water in the Reactor, Turbine, and Radwaste buildings that can contain potentially radioactive detergent and transfer the fluid directly by gravity to the Radwaste Building sump or the detergent drain tanks. It is also used to drain the decontamination solution in the Reactor Building from the decontamination pit and Reactor Closed Cooling Water chemical addition tank to the chemical waste tanks. Additionally the system also consists of SLC System drains. These equipment and floor drains collect borated water from the SLC System and direct it to 55-gallon drums located in the Reactor Building.

Reason for Scope Determination

The MWR System provides Primary Containment isolation and integrity, and secondary containment isolation and integrity. These system-intended functions are safety-related. Therefore, the MWR System meet the scoping criteria of 10 CFR 54.4(a)(1).

The MWR System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The MWR System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the MWR System meets the scoping criteria of 10 CFR 54.4(a)(2).

The MWR System is not relied upon to demonstrate compliance with the 10 CFR 54.4(a)(3) scoping criteria for any regulated events.

FSAR References

Section 11.2 of the FSAR describes the Liquid Waste Management System, evaluated for license renewal as the MWR System

License Renewal Drawings

The following license renewal drawing depicts the evaluation boundaries for the system components within the scope of license renewal:

LR-M539

Insert: ", LR-M531, LR-M533-1, LR-M533-2"

Components Subject to AMR

Table 2.3.3-26 lists the component types that require AMR and their intended functions.

Table 3.3.2-26, Aging Management Review Results – Miscellaneous Waste Radioactive System, provides the results of the AMR.

W 32-1

before adverse consequences (i.e., interaction with safety-related structures and components) would manifest. Therefore, plumbing fixtures are not subject to AMR.

Table 2.3.3-30
Potable Hot Water System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Piping	Structural Integrity
Shock suppressor	Structural Integrity
Valve body	Structural Integrity

Insert A from page 2.3-117a

W 32-1

Insert A to Table 2.3.3-30:

Tubing	Structural Integrity

W 32-2

Table 3.3.2-30 Aging Management Review Results – Potable Hot Water System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
10	Valve Body	Structural integrity	Copper Alloy > 15% Zn	Air-indoor uncontrolled (External)	None	None	VIII.I-2	3.4.1-41	A

Insert new table rows 11 through 13 for Table 3.3.2-30, as show on page 3.3-291a

Amendment 1

W 32-2

Table 3.3.2-30 Aging Management Review Results – Potable Hot Water System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
11	Tubing	Structural integrity	Copper Alloy > 15% Zn	Raw water (Internal)	Loss of material	Potable Water Monitoring	VII.C1-9	3.3.1-81	E
12	Tubing	Structural integrity	Copper Alloy > 15% Zn	Raw water (Internal)	Loss of material	Selective Leaching Inspection	VII.C1-10	3.3.1-84	A
13	Tubing	Structural integrity	Copper Alloy > 15% Zn	Air-indoor uncontrolled (External)	None	None	VIII.I-2	3.4.1-41	A

W 32-3

- Parameters Monitored or Inspected
  The Potable Water Monitoring Program monitors the water treatment plant performance and the overall status of the potable water system, including water quality.

- Detection of Aging Effects
  The Potable Water Monitoring Program will be enhanced to use a combination of established volumetric and visual examination techniques performed by qualified personnel on locations within the PWC, PWH, and ROA systems, as determined by engineering evaluation, to identify evidence of a loss of material, or to confirm a lack thereof. At least one inspection will be conducted within the 10-year period prior to the period of extended operation.

  Based on operating experience, it is necessary that inspections be conducted at least once every five years, and include components of the PWC and PWH systems that are located in the Reactor Building, and components associated with the ROA air washer (ROA-AW-1), including the air washer housing.

  Insert: "or Radwaste Building (including corridors)"

- Monitoring and Trending
  The Potable Water Monitoring Program monitors the water treatment plant performance and the overall status of the potable water system, including water quality, and the results are recorded and trended.

- Acceptance Criteria
  The acceptance criteria for potable water system inspections are: indications or relevant conditions of degradation detected during the inspection will be compared to pre-determined acceptance criteria. If the acceptance criteria are not met, then the indications and conditions will be evaluated under the corrective action program to determine whether they could result in a loss of component intended function during the period of extended operation.

  Acceptance criteria have been established for potable water quality, which minimizes the presence of impurities that could cause degradation.

- Corrective Actions
  This element is common to Columbia programs and activities that are credited with aging management during the period of extended operation and is discussed in Section B.1.3.

- Confirmation Process
  This element is common to Columbia programs and activities that are credited with aging management during the period of extended operation and is discussed in Section B.1.3.

W 34

FSAR References

Section 5.4.8 of the FSAR describes the Reactor Water Cleanup System.

License Renewal Drawings

The following license renewal drawings depict the evaluation boundaries for the system components within the scope of license renewal:

Insert: ", LR-M536"

LR-M523-1, LR-M523-2

Portions of the RWCU System are in the Radwaste Building and outside of the control room tower boundary; as such these components are outside the scope of license renewal. This includes the filter demineralizer subsystem and its associated demineralizers, piping, pumps, and tanks.

Components Subject to AMR

Table 2.3.3-39 lists the component types that require AMR and their intended functions.

Table 3.3.2-39, Aging Management Review Results – Reactor Water Cleanup System, provides the results of the AMR.

The external subcomponents (shell and channel covers) of the RWCU heat exchangers will contain fluid leakage in the event of a failure of an internal subcomponent (tubes and tubesheet). Failure of an internal subcomponent will therefore not create the potential for spatial interaction that could prevent a safety-related SSC from performing its intended function. Therefore, the RWCU heat exchanger tubes and tubesheets are not subject to AMR.

Class 1 components of the RWCU System that are part of the reactor coolant pressure boundary are evaluated in Section 2.3.1.3.

W 35-1

Table 2.2-1 License Renewal Scoping Results for Mechanical Systems (continued)		
System Name	**In Scope?**	**Screening Results Section**
Radwaste Building Chilled Water	Yes	2.3.3.36
Radwaste Building Exhaust Air	Yes	2.3.3.37
Radwaste Building Heating Condensate	No	
Radwaste Building Mixed Air	Yes	2.3.3.37
Radwaste Building Outside Air	Yes	2.3.3.37
Radwaste Building Potable Hot Water	No	
Radwaste Building Refrigeration	No	
Radwaste Building Return Air	Yes	2.3.3.37
Reactor Building Exhaust Air	Yes	2.3.3.38
Reactor Building Outside Air	Yes	2.3.3.38
~~Reactor Building Potable Hot Water~~	~~No~~	
Reactor Building Return Air (Emergency Cooling)	Yes	2.3.3.38
Reactor Closed Cooling Water	Yes	2.3.3.39
Reactor Core Isolation Cooling	Yes	2.3.2.2
Reactor Feedwater	Yes	2.3.4.7
Reactor Feedwater Turbine	No	
Reactor Protection System	Yes	2.3.3.40
Reactor Recirculation	Yes	2.3.1.3
Reactor Service Equipment	No	
Reactor Water Cleanup	Yes	2.3.3.41
Residual Heat Removal	Yes	2.3.2.1
Roof Drains	Yes	2.3.3.23
Reactor Recirculation Hydraulic Control	No	
Sampling	Yes	2.3.3.34
Seal Oil	No	
Sealing Steam	Yes ~~No~~	2.3.4.8
Service Air	Yes	2.3.3.42
Service Building Chilled Water	No	

W 35-2

2.3.4 Steam and Power Conversion Systems

The steam and power conversion systems are those systems used as a heat sink to remove heat from the reactor and convert the heat generated in the reactor to the electrical output produced by the plant. The following Columbia systems are addressed in this section:

- Auxiliary Steam (AS) System (Section 2.3.4.1)
- Condensate (Auxiliary) (CO) System (Section 2.3.4.2)
- Condensate (Nuclear) (COND) System (Section 2.3.4.3)
- Main Steam (MS) System (Section 2.3.4.4)
- Main Steam Leakage Control (MSLC) System (Section 2.3.4.5)
- Miscellaneous Drain (MD) System (Section 2.3.4.6)
- Reactor Feedwater (RFW) System (Section 2.3.4.7)

Insert:
"Sealing Steam (SS) System (Section 2.3.4.8)"

A brief system description, reason for scope determination, associated FSAR references, associated license renewal drawings, and components subject to AMR information is provided for each system.

Amendment 1

W35-3

The ASME Class 1 portions of the RFW System are addressed with the reactor coolant pressure boundary in Section 2.3.1.3.

Components Subject to AMR

Table 2.3.4-7 lists the component types that require AMR and their intended functions.

Table 3.4.2-7, Aging Management Review Results – Reactor Feedwater System, provides the results of the AMR.

The small-bore lines to flow transmitters RFW-FT-802A and 802B are decoupled from the piping analysis, and are therefore not in scope.

The flow meter section is in scope only for NSAS; therefore, the internals, including the flow straighteners and the nozzles are not in scope.

Table 2.3.4-7
Reactor Feedwater System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Bolting	Structural integrity
Flow element	Structural integrity
Piping	Structural integrity
Valve body	Structural integrity

Insert pages 2.3-180a and 2.3-180b following this page

Amendment 1

W 35-3

2.3.4.8 Sealing Steam System

System Description

The Sealing Steam (SS) System consists of two 100%-capacity gland seal steam evaporators, seal steam pressure regulators, seal steam header, gland seal steam condenser, exhauster blowers, and the associated piping, valves, and instrumentation. Sealing steam for turbine shaft seal glands and valve stem seal glands (stop, control, reheat stop, intercept, and bypass valves) is supplied from the seal steam header at 200 psig. The source of sealing steam is from the gland seal steam evaporators or the auxiliary steam boiler. The sealing steam is produced in an evaporator which is heated by extraction steam taken from the high pressure turbine. The condensate fed to the evaporator is taken from the suction header of the reactor feedwater pumps in the feedwater system. During startup and low load operations, a branch line taken off the main steam header supplies the necessary heating steam for the evaporator.

Separate seal steam regulators are provided to regulate the pressure of sealing steam for the high pressure turbine, each low pressure turbine, each reactor feed pump turbine shaft seal, the bypass valve assembly, and the main stop and control valve assembly stems.

Since the low pressure (LP) turbine and reactor feedwater pump turbine exhaust pressures are at a vacuum, sufficient sealing steam is supplied to maintain positive pressure in the glands to prevent air inleakage along the shaft. The high pressure (HP) turbine exhaust pressure varies with load and is approximately 177 psia at its maximum. The system is designed to maintain the seal steam supply to the HP turbine glands at a pressure of 16 to 20 psi above HP turbine exhaust to prevent HP turbine exhaust steam leakage through the shaft gland seal.

The outer leakoff of all glands is routed to the gland seal steam condenser which is maintained at a slight vacuum by the exhauster blower. During plant operation, the gland seal steam condenser and one motor-driven blower is in operation. The exhauster blower discharges gland air inleakage to the atmosphere via the reactor building elevated release duct. The gland seal steam condenser is cooled by the main condensate flow.

The steam evaporator is a shell-and-tube heat exchanger designed to provide a continuous supply of clean sealing steam to the seal steam header.

Reason for Scope Determination

The SS System does not perform any safety-related system intended functions that meet the scoping criteria of 10 CFR 54.4(a)(1).

The SS System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The SS System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the SS System meets the scoping criteria of 10 CFR 54.4(a)(2).

The SS System is not relied upon to demonstrate compliance with the 10 CFR 54.4(a)(3) scoping criteria for any regulated events.

FSAR References

Section 10.4.3.2 of the FSAR describes the Sealing Steam System.

License Renewal Drawings

The following license renewal drawing depicts the evaluation boundaries for the system components within the scope of license renewal:

LR-M502-3

Components Subject to AMR

Table 2.3.4-8 lists the component types that require AMR and their intended functions.

Table 3.4.2-8, Aging Management Review Results – Sealing Steam System, provides the results of the AMR.

Table 2.3.4-8
Sealing Steam System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Piping	Structural integrity

W35-4

3.4 AGING MANAGEMENT OF STEAM AND POWER CONVERSION SYSTEMS

3.4.1 Introduction

Section 3.4 provides the results of the aging management reviews (AMRs) for those components identified in Section 2.3.4, Steam and Power Conversion Systems, as subject to AMR. The systems or portions of systems are described in the indicated sections of the Application.

- Auxiliary Steam System (Section 2.3.4.1)
- Condensate (Auxiliary) System (Section 2.3.4.2)
- Condensate (Nuclear) System (Section 2.3.4.3)
- Main Steam System (Section 2.3.4.4)
- Main Steam Leakage Control System (Section 2.3.4.5)
- Miscellaneous Drain System (Section 2.3.4.6)
- Reactor Feedwater System (Section 2.3.4.7) Insert A from page 3.4-1a

Table 3.4.1, Summary of Aging Management Programs for Steam and Power Conversion Systems Evaluated in Chapter VIII of NUREG-1801, provides the summary of the programs evaluated in NUREG-1801 that are applicable to component and commodity groups in this section. Text addressing summary items requiring further evaluation is provided in Section 3.4.2.2.

3.4.2 Results

The following tables summarize the results of the AMR for the Steam and Power Conversion Systems.

Table 3.4.2-1	Aging Management Review Results - Auxiliary Steam System
Table 3.4.2-2	Aging Management Review Results - Condensate (Auxiliary) System
Table 3.4.2-3	Aging Management Review Results - Condensate (Nuclear) System
Table 3.4.2-4	Aging Management Review Results - Main Steam System
Table 3.4.2-5	Aging Management Review Results - Main Steam Leakage Control System
Table 3.4.2-6	Aging Management Review Results - Miscellaneous Drain System
Table 3.4.2-7	Aging Management Review Results - Reactor Feedwater System

Insert B from page 3.4-1a

Amendment 1

W 35-4

Insert A to LRA Section 3.4.1

- Sealing Steam System (Section 2.3.4.8)

Insert B to LRA Section 3.4.2

Table 3.4.2-8 Aging Management Review Results – Sealing Steam System

W 35-5

Aging Management Programs

The following aging management programs manage the aging effects for the subject mechanical components of the Reactor Feedwater System:

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- External Surfaces Monitoring Program
- Flow-Accelerated Corrosion (FAC) Program

Insert new Section 3.4.2.1.8 from page 3.4-9a

3.4.2.2 Further Evaluation of Aging Management as Recommended by NUREG-1801

For the Steam and Power Conversion systems, those items requiring further evaluation are addressed in the following sections.

3.4.2.2.1 Cumulative Fatigue Damage

Fatigue is a time-limited aging analysis, as defined in 10 CFR 54.3. Time-limited aging analyses are required to be evaluated in accordance with 10 CFR 54.21(c). Time-limited aging analyses identified for fatigue in the Steam and Power Conversion systems are evaluated in Section 4.3.4.

3.4.2.2.2 Loss of Material due to General, Pitting, and Crevice Corrosion

3.4.2.2.2.1 Piping, Piping Components, Piping Elements, Tanks, and Heat Exchangers

Loss of material due to general, pitting, and crevice corrosion for steel piping components and tanks exposed to treated water (including steam) in the Steam and Power Conversion systems is managed by the BWR Water Chemistry Program. The BWR Water Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a verification of the effectiveness of the BWR Water Chemistry Program to manage loss of material due to general, pitting, and crevice corrosion through examination of steel piping components and tanks exposed to treated water.

3.4.2.2.2.2 Piping, Piping Components, and Piping Elements – Lubricating Oil

As described in Table 3.4.1, there are no components compared to item number 3.4.1-07. There are no steel components exposed to a lubricating oil environment that are subject to AMR for the Steam and Power Conversion systems.

W 35-5

3.4.2.1.8 Sealing Steam System

Materials

The materials of construction for subject mechanical components of the Sealing Steam System are:

- Steel

Environments

Subject mechanical components of the Sealing Steam System are exposed to the following normal operating environments:

- Air-indoor uncontrolled
- Steam

Aging Effects Requiring Management

The following aging effects require management for the subject mechanical components of the Sealing Steam System:

- Loss of material

Aging Management Programs

The following aging management programs manage the aging effects for subject mechanical components of the Sealing Steam System:

- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- External Surfaces Monitoring Program
- Flow-Accelerated Corrosion (FAC) Program

W 35-6

Table 3.4.2-7 Aging Management Review Results – Reactor Feedwater System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
17	Valve Body	Structural integrity	Steel	Treated water > 60 °C (140 °F) (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VIII.D2-7	3.4.1-04	A 0403
18	Valve Body	Structural integrity	Steel	Treated water > 60 °C (140 °F) (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	VIII.D2-8	3.4.1-29	A 0403
19	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VIII.H-7	3.4.1-28	A

Insert New Table 3.4.2-8 from page 3.4-76a

W 35-6

Table 3.4.2-8 Aging Management Review Results – Sealing Steam System									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
1	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	VIII.C-4	3.4.1-02	A
2	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VIII.C-4	3.4.1-02	A
3	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	VIII.C-5	3.4.1-29	A
4	Piping	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VIII.H-7	3.4.1-28	A

W 35-7

Plant-Specific Notes:	
0404	The aging effect determination for the Air-indoor uncontrolled (Internal) environment is the same as the NUREG-1801 determination for an Air-indoor uncontrolled (External) environment because the material is the same and the internal environment is equivalent to the external environment evaluated in the NUREG-1801 item. Monitoring of the external surface condition will be used to characterize the aging effects on the internal surfaces.
0405	Bolting associated with the quenchers is stainless steel and located in the suppression pool.
0406	This steel component has an external surface temperature > 212 °F. Therefore, the surface is dry and general corrosion is not an aging effect requiring management; there are also no other aging effects requiring management.
0407	The Bolting Integrity Program will also manage cracking for the carbon and low-alloy (steel) bolting at the base and foundation of the CSTs due to potential for ponding or pooling of water.
0408	The Buried Piping and Tanks Inspection Program will manage loss of material for the carbon steel (steel) piping from the CSTs that is enclosed in guard pipe and buried.
0409	The Aboveground Steel Tanks Inspection will detect and characterize loss of material at the base of each CST in contact with the tank foundation.
0410	The aging effect determination for the Air-indoor uncontrolled (Internal) environment is the same as the NUREG-1801 determination for an Air-indoor uncontrolled (External) environment because the material is the same and the internal environment is equivalent to the external environment evaluated in the NUREG-1801 item There are no aging effects requiring management.
0411	The aging effect determination for the Air-outdoor (Internal) environment is the same as the NUREG-1801 determination for an Air-outdoor (External) environment because the material is the same and the internal environment is equivalent to the external environment evaluated in the NUREG-1801 item. Monitoring of the external surface condition will be used to characterize the aging effects on the internal surfaces.

Add:
0412 - The normal environment of the Sealing Steam System is evaluated as a steam environment from when the steam evaporator relief valves are actuated.

W 36-

License Renewal Drawings

The following license renewal drawings depict the evaluation boundaries for the system components within the scope of license renewal:

LR-M508-1, LR-M548-2

Insert: ", LR-M508-2"

Components Subject to AMR

Table 2.3.3-28 lists the component types that require AMR and their intended functions.

Table 3.3.2-28, Aging Management Review Results – Plant Service Water System, provides the results of the AMR.

Table 2.3.3-28
Plant Service Water System
Components Subject to Aging Management Review

Component Type	**Intended Function (as defined in Table 2.0-1)**
Annubar	Structural Integrity
Bolting	Structural Integrity
Flow indicator (inline)	Structural Integrity
Orifice	Structural Integrity
Piping	Structural Integrity
Strainer (body)	Structural Integrity
Tubing	Structural Integrity
Valve body	Structural Integrity

W 37-1

Table 3.3.2-1, Aging Management Review Results – Circulating Water System, provides the results of the AMR.

Insert A from page 2.3-37a

Table 2.3.3-1
Circulating Water System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Bolting	Pressure Boundary
Piping	Pressure Boundary
~~Rupture disc~~	~~Pressure Boundary~~
Valve body	Pressure Boundary

W-37-1

Insert A to page 2.3-37

Per FSAR Section 9.2.5.3, if the service water spray headers are damaged by a tornado-generated missile, cooling is provided by a feed-and-bleed mode of operation. In the feed-and-bleed mode, cooling water is supplied to the spray ponds from the makeup water pump house. The service water system takes suction from the spray ponds to provide cooling to safe shutdown equipment. The cooling water is then routed to tornado-protected underground circulating water piping and discharged to the circulating water basin. Since rupture disks CW-RD-1A/B are located in the circulating water basin, their failure will not prevent the Circulating Water System from performing its intended function. Since the rupture disks do not perform a license renewal intended function, they are not subject to AMR.

W 37-2

Aging Effects Requiring Management

The following aging effects require management for the subject mechanical components of the Circulating Water System:

- Loss of material
- Loss of pre-load

Add: "Cracking"

Aging Management Programs

The following aging management programs manage the aging effects for subject mechanical components of the Circulating Water System:

- Bolting Integrity Program
- Buried Piping and Tanks Inspection Program
- External Surfaces Monitoring Program
- Open-Cycle Cooling Water Program
- Selective Leaching Inspection

3.3.2.1.2 Condensate Processing Radioactive (Demineralizer) System

Materials

The material of construction for subject mechanical components of the Condensate Processing Radioactive (Demineralizer) System is:

- Steel

Environments

Subject mechanical components of the Condensate Processing Radioactive (Demineralizer) System are exposed to the following normal operating environments:

- Air-indoor uncontrolled
- Treated water

Aging Effects Requiring Management

The following aging effects require management for the subject mechanical components of the Condensate Processing Radioactive (Demineralizer) System:

- Loss of material
- Loss of pre-load

W 37-3

Table 3.3.2-1 Aging Management Review Results – Circulating Water System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
1	Bolting	Pressure boundary	Steel	Air-outdoor (External)	Loss of material	Bolting Integrity	VII.I-1	3.3.1-43	B
2	Bolting	Pressure boundary	Steel	Air-outdoor (External)	Loss of pre-load	Bolting Integrity	N/A	N/A	H
3	Piping	Pressure boundary	Concrete	Raw water (Internal)	None	None	N/A	N/A	G
4	Piping	Pressure boundary	Concrete	Soil (External)	None	None	II.B1.2-1	3.5.1-2	I 0301
5	Piping	Pressure boundary	Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-19	3.3.1-76	B
6	Piping	Pressure boundary	Steel	Air-outdoor (External)	Loss of material	External Surfaces Monitoring	VII.I-9	3.3.1-58	A
7	Piping	Pressure boundary	Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	VII.C1-18	3.3.1-19	A
~~8~~	~~Rupture Disc~~	~~Pressure boundary~~	~~Stainless Steel~~	~~Raw water (Internal)~~	~~Loss of material~~	~~Open-Cycle Cooling Water~~	~~VII.C1-15~~	~~3.3.1-79~~	~~B~~
~~9~~	~~Rupture Disc~~	~~Pressure boundary~~	~~Stainless Steel~~	~~Raw water (External)~~	~~Loss of material~~	~~Open-Cycle Cooling Water~~	~~VII.C1-15~~	~~3.3.1-79~~	~~B~~

Delete rows 8 and 9

Amendment 1

W 37-4

Table 3.3.2-1 Aging Management Review Results – Circulating Water System									
Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
10	Valve Body	Pressure boundary	Gray Cast Iron	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-19	3.3.1-76	B
11	Valve Body	Pressure boundary	Gray Cast Iron	Raw water (Internal)	Loss of material	Selective Leaching Inspection	VII.C1-11	3.3.1-85	A
12	Valve Body	Pressure boundary	Gray Cast Iron	Air-outdoor (External)	Loss of material	External Surfaces Monitoring	VII.I-9	3.3.1-58	A
13	Valve Body	Pressure boundary	Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-19	3.3.1-76	B
14	Valve Body	Pressure boundary	Steel	Air-outdoor (External)	Loss of material	External Surfaces Monitoring	VII.I-9	3.3.1-58	A

Insert new rows 15 through 21 for Table 3.3.2-1 as shown on page 3.3-119a

Amendment 1

W 37-4

Table 3.3.2-1 Aging Management Review Results – Circulating Water System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
15	Bolting	Pressure boundary	Steel	Soil (External)	Cracking	Buried Piping and Tanks Inspection	N/A	N/A	G
16	Bolting	Pressure boundary	Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	N/A	N/A	G
17	Bolting	Pressure boundary	Steel	Soil (External)	Loss of pre-load	Buried Piping and Tanks Inspection	N/A	N/A	G
18	Bolting	Pressure boundary	Stainless Steel	Soil (External)	Cracking	Buried Piping and Tanks Inspection	N/A	N/A	F
19	Bolting	Pressure boundary	Stainless Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	N/A	N/A	F
20	Bolting	Pressure boundary	Stainless Steel	Soil (External)	Loss of pre-load	Buried Piping and Tanks Inspection	N/A	N/A	F
21	Valve body	Pressure boundary	Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	VII.C1-18	3.3.1-19	A

W 58-1

an aggressive environment. Therefore, loss of material due to pitting and crevice corrosion is not an aging effect requiring management for these components.

3.3.2.2.10.7 Stainless Steel Piping, Piping Components, and Piping Elements - Soil

~~As described in Table 3.3.1, there are no components compared to item number 3.3.1-29. There is no stainless steel piping subject to AMR for Columbia that is exposed to soil in the Auxiliary systems.~~ Replace with Insert A on page 3.3-55a

3.3.2.2.10.8 BWR Standby Liquid Control System

Loss of material due to pitting and crevice corrosion for stainless steel piping components and tanks exposed to sodium pentaborate solution is managed by the BWR Water Chemistry Program. The BWR Water Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a verification of the effectiveness of the BWR Water Chemistry Program to manage loss of material due to pitting and crevice corrosion through examination of stainless steel piping components and tanks exposed to sodium pentaborate solution.

Replace with Insert B from page 3.3-55a

3.3.2.2.11 Loss of Material due to Pitting, Crevice, and Galvanic Corrosion

~~As described in Table 3.3.1, there were no components compared to item number 3.3.1-31. There are no copper alloy piping, piping components, or piping elements in the Auxiliary systems that are exposed to treated water.~~

3.3.2.2.12 Loss of Material due to Pitting, Crevice, and Microbiologically Influenced Corrosion

3.3.2.2.12.1 Piping, Piping Components, and Piping Elements – Fuel Oil

There are no aluminum piping components exposed to fuel oil that are subject to AMR.

Loss of material due to pitting and crevice corrosion and MIC for stainless steel and copper alloy piping components exposed to fuel oil is managed by the Fuel Oil Chemistry Program. The Fuel Oil Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a verification of the effectiveness of the Fuel Oil Chemistry Program to manage loss of material through examination of piping and components exposed to fuel oil.

3.3.2.2.12.2 Piping, Piping Components, and Piping Elements – Lubricating Oil

Loss of material due to pitting and crevice corrosion and MIC for stainless steel piping components and heat exchanger components exposed to lubricating oil is managed by the Lubricating Oil Analysis Program. The Lubricating Oil Analysis Program manages aging effects through periodic monitoring and control of contaminants, including water. The Lubricating Oil Inspection will provide a verification of the effectiveness of the

W 38-1

Insert A to LRA Section 3.3.2.2.10.7

The Buried Piping Thanks Inspection Program, with enhancement, manages loss of material due to pitting and crevice corrosion and microbiologically influenced corrosion (MIC) for stainless steel piping and piping components buried in soil.

Insert B to LRA Section 3.3.2.2.11

Loss of material due to pitting, crevice, and galvanic corrosion for copper alloy piping, piping components, or piping elements exposed to treated water is managed by the BWR Water Chemistry Program. The BWR Water Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a verification of the effectiveness of the BWR Water Chemistry Program to manage loss of material due to pitting, crevice, and galvanic corrosion through examination of copper alloy piping and piping components exposed to treated water.

W 38-2

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of NUREG-1801

Item Number	Component/Commodity	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-28	Copper alloy fire protection piping, piping components, and piping elements exposed to condensation (internal)	Loss of material due to pitting and crevice corrosion	A plant-specific aging management program is to be evaluated.	Yes, plant specific	Not applicable. There are no copper alloy fire protection piping, piping components, or piping elements in the auxiliary systems that are exposed to condensation (internal). Refer to Section 3.3.2.2.10.6 for further information.
3.3.1-29	Stainless steel piping, piping components, and piping elements exposed to soil	Loss of material due to pitting and crevice corrosion	A plant-specific aging management program is to be evaluated.	Yes, plant specific	~~Not applicable.~~ ~~There are no stainless steel piping, piping components, or piping elements in the auxiliary systems that are exposed to soil.~~ Refer to Section 3.3.2.2.10.7 for further information.

Replace with Insert A on page 3.3-75a

Amendment 1

W 38-2

Insert A to LRA Table 3.3.1 Item 3.3.1-29

The Buried Piping and Tanks Inspection Program, with enhancement, is credited to manage loss of material for stainless steel piping, piping components and piping elements (with or without coating or wrapping) in the auxiliary systems that are exposed to soil.

W 38-3

A.1.2.4 Bolting Integrity Program

The Bolting Integrity Program is a combination of existing activities that, in conjunction with other credited programs, address the management of aging for the bolting of mechanical components and structural connections within the scope of license renewal. The Bolting Integrity Program relies on manufacturer and vendor information and industry recommendations for the proper selection, assembly, and maintenance of bolting for pressure-retaining closures and structural connections. The Bolting Integrity Program includes, through the Inservice Inspection (ISI) Program, Inservice Inspection (ISI) Program – IWF, Structures Monitoring Program, and External Surfaces Monitoring Program, the periodic inspection of bolting for indications of degradation such as leakage, loss of material due to corrosion, loss of pre-load, and cracking due to stress corrosion cracking (SCC) and fatigue.

A.1.2.5 Buried Piping and Tanks Inspection Program

Replace deleted text with Insert A on page A-9a

~~The Buried Piping and Tanks Inspection Program manages the effects of loss of material due to corrosion on the external surfaces of piping and tanks exposed to a buried environment.~~ The Buried Piping and Tanks Inspection Program is a combination of a mitigation program (consisting of protective coatings) and a condition monitoring program (consisting of visual inspections).

An inspection of buried piping will be performed within the 10-year period prior to entering the period of extended operation. An additional inspection of buried piping will be performed within 10 years after entering the period of extended operation.

The Buried Piping and Tanks Inspection Program is an existing program that requires enhancement prior to the period of extended operation.

A.1.2.6 BWR Feedwater Nozzle Program

The BWR Feedwater Nozzle Program is an existing program that manages cracking due to stress corrosion cracking and intergranular attack (SCC/IGA) and flaw growth of the feedwater nozzles. The BWR Feedwater Nozzle Program is in accordance with ASME Section XI and NRC augmented requirements.

The BWR Feedwater Nozzle Program consists of: (a) enhanced inservice inspection in accordance with the requirements of the ASME Boiler and Pressure Vessel Code, Section XI, Subsection IWB, Table IWB 2500-1 (2001 edition including the 2002 and 2003 Addenda) and the recommendations of General Electric report NE-523-A71-0594-A [Reference A.1.4-1], and (b) system modifications, as described in FSAR Section 5.3.3.1.4.5, to mitigate cracking. The program specifies periodic ultrasonic inspection of critical regions of the feedwater nozzles.

W 38-3

Insert A to LRA Section A.1.2.5

The Buried Piping and Tanks Inspection Program manages the effects of loss of material due to corrosion on the external surfaces of piping, piping components and tanks exposed to a buried environment. The program also manages the effects of cracking, loss of material and loss of pre-load for bolting exposed to a buried environment.

W 38-4

Table A-1
Columbia License Renewal Commitments

Item Number	Commitment	FSAR Supplement Location (LRA App. A)	Enhancement or Implementation Schedule
5) Buried Piping and Tanks Inspection Program	The Buried Piping and Tanks Inspection Program is an existing program that will be continued for the period of extended operation, with the following enhancements: • Revise the site program document to include the buried portions of the Radwaste Building Outside Air (WOA) piping. • Require that an inspection of a representative sample of buried piping be performed within the 10-year period prior to entering the period of extended operation (i.e., between year 30 and year 40). • Require an additional inspection of a representative sample of buried piping be performed within 10 years after entering the period of extended operation (i.e., between year 40 and year 50).	A.1.2.5 Add Insert A from page A-43a	Enhancement prior to the period of extended operation. Then ongoing.
6) BWR Feedwater Nozzle Program	The BWR Feedwater Nozzle Program is an existing program that will be continued for the period of extended operation.	A.1.2.6	Ongoing
7) BWR Penetrations Program	The BWR Penetrations Program is an existing program that will be continued for the period of extended operation.	A.1.2.7	Ongoing
8) BWR Stress Corrosion Cracking Program	The BWR Stress Corrosion Cracking Program is an existing program that will be continued for the period of extended operation.	A.1.2.8	Ongoing

W 38-4

Insert A to LRA Table A-1 Item Number 5

- Revise the site program document to include cracking, loss of material and loss of pre-load of bolting as aging effects managed by the program.
- Revise the site program document to include loss of material of stainless steel piping and piping components as an aging effect managed by the program.

W 38-5

B.2.5 Buried Piping and Tanks Inspection Program

Program Description

~~The Buried Piping and Tanks Inspection Program will manage the effects of loss of material due to corrosion on the external surfaces of piping and tanks exposed to a buried environment.~~ Replace with Insert A on page B-39a

The Buried Piping and Tanks Inspection Program is a combination of a mitigation program (consisting of protective coatings) and a condition monitoring program (consisting of visual inspections). Integrity of coatings will be inspected when components are excavated for maintenance or other reasons. If an opportunistic inspection has not occurred between year 30 and year 38, an excavation of a section of buried piping for the purpose of inspection will be performed before year 40. An additional inspection of buried piping will be performed within 10 years after entering the period of extended operation.

The Buried Piping and Tanks Inspection Program will continue to ensure that the pressure boundary integrity of the subject components is maintained consistent with the current licensing basis during the period of extended operation.

NUREG-1801 Consistency

The Buried Piping and Tanks Inspection Program is an existing Columbia program that, with enhancement, will be consistent with the 10 elements of an effective aging management program as described in NUREG-1801, Section XI.M34, "Buried Piping and Tanks Inspection."

Exceptions to NUREG-1801

None.

Required Enhancements

Prior to the period of extended operation the enhancements listed below will be implemented in the identified program element:

- **Scope of Program –**

  Revise the site program document to include the buried portions of the Radwaste Building Outside Air (WOA) piping.

Add Insert B on page B-39a

W 38-5

Insert A to LRA Section B.2.5, page B-39

The Buried Piping and Tanks Inspection Program will manage the effects of loss of material due to corrosion on the external surfaces of piping, piping components and tanks exposed to a buried environment. The program also manages cracking, loss of material and loss of pre-load for bolting exposed to a buried environment.

Insert B to LRA Section B.2.5, page B-39

Revise the site program document to include cracking, loss of material and loss of pre-load of bolting as aging effects managed by the program.

Revise the site program document to include loss of material of stainless steel piping and piping components as an aging effect managed by the program.

W 38-6

- **Detection of Aging Effects –**

  Require that an inspection of a representative sample of buried piping be performed within the 10-year period prior to entering the period of extended operation (i.e., between year 30 and year 40).

  Require an additional inspection of a representative sample of buried piping be performed within 10 years after entering the period of extended operation (i.e., between year 40 and year 50).

Operating Experience

No history of piping degradation due to external corrosion of buried piping was identified for Columbia through searches of operating experience or discussions with program owners. Columbia operating experience demonstrates that the coating of buried steel piping and tanks is effective in managing the effects of aging. Plant design considerations addressed the potential for degradation of buried piping components through the application of protective coatings.

A review was conducted of station piping failures, and it was determined that there had been no documented failures attributed to externally-initiated corrosion. Identified instances of leakage associated with buried piping have been the result of internal corrosion.

The environmental conditions at Columbia are very good based on the sandy soil and electrolyte resistivity of the soil which is considered very high. This has resulted in minimal degradation of buried piping as evidenced by excavations of certain sections of piping for examination. There have been no significant areas of degradation caused by protective coating failure. This was determined after a section of buried Standby Service Water (SW) System piping was excavated and evaluated in 2007.

Conclusion

Replace with Insert A on Page B-40a

~~The Buried Piping and Tanks Inspection Program will manage loss of material due to corrosion for susceptible piping components and tanks in buried environments.~~ The Buried Piping and Tanks Inspection Program, with the required enhancements, provides reasonable assurance that the aging effects will be managed such that components subject to aging management review will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

Amendment 1

W 38-6

Insert A to LRA Section B.2.5, page B-40

The Buried Piping and Tanks Inspection Program will manage cracking and loss of pre-load of bolting and loss of material due to corrosion for susceptible bolting, piping, piping components and tanks in buried environments.

W 39

Table 3.3.2-18 Aging Management Review Results – Diesel Fuel Oil System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
73	Tubing	Pressure boundary	Stainless Steel	Fuel oil (Internal)	Loss of material	Fuel Oil Chemistry	VII.H1-6	3.3.1-32	B
74	Tubing	Pressure boundary	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A
75	Valve Body	Pressure boundary	Steel	Fuel oil (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VII.H1-10	3.3.1-20	A
76	Valve Body	Pressure boundary	Steel	Fuel oil (Internal)	Loss of material	Fuel Oil Chemistry	VII.H1-10	3.3.1-20	B
77	Valve Body	Pressure boundary	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
78	Valve Body	Structural integrity	Steel	Fuel oil (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VII.H1-10	3.3.1-20	A
79	Valve Body	Structural integrity	Steel	Fuel oil (Internal)	Loss of material	Fuel Oil Chemistry	VII.H1-10	3.3.1-20	B
80	Valve Body	Structural integrity	Steel	Air-outdoor (External)	Loss of material	External Surfaces Monitoring	VII.I-9	3.3.1-58	A

Insert new rows 81 through 86 for Table 3.3.2-18 as shown on page 3.3-215a

Amendment 1

Table 3.3.2-18 Aging Management Review Results – Diesel Fuel Oil System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
81	Bolting	Pressure boundary	Steel	Soil (External)	Cracking	Buried Piping and Tanks Inspection	N/A	N/A	G
82	Bolting	Pressure boundary	Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	N/A	N/A	G
83	Bolting	Pressure boundary	Steel	Soil (External)	Loss of pre-load	Buried Piping and Tanks Inspection	N/A	N/A	G
84	Bolting	Structural integrity	Steel	Soil (External)	Cracking	Buried Piping and Tanks Inspection	N/A	N/A	G
85	Bolting	Structural integrity	Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	N/A	N/A	G
86	Bolting	Structural integrity	Steel	Soil (External)	Loss of pre-load	Buried Piping and Tanks Inspection	N/A	N/A	G

W 40

Table 3.3.2-22 Aging Management Review Results –Fire Protection System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
177	Valve Body	Pressure boundary	Steel	Raw water (Internal)	Loss of material	Fire Water	VII.G-24	3.3.1-68	A
178	Valve Body	Pressure boundary	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
179	Valve Body	Pressure boundary	Steel	Air-outdoor (External)	Loss of material	External Surfaces Monitoring	VII.I-9	3.3.1-58	A
180	Valve Body	Pressure boundary	Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	VII.G-25	3.3.1-19	A

Insert new rows 181 through 183 for Table 3.3.2-22 as shown on page 3.3-256a

Amendment 1

W 40

Table 3.3.2-22 Aging Management Review Results – Fire Protection System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
181	Bolting	Pressure boundary	Steel	Soil (External)	Cracking	Buried Piping and Tanks Inspection	N/A	N/A	G
182	Bolting	Pressure boundary	Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	N/A	N/A	G
183	Bolting	Pressure boundary	Steel	Soil (External)	Loss of pre-load	Buried Piping and Tanks Inspection	N/A	N/A	G

W41

Table 3.3.2-36 Aging Management Review Results – Radwaste Building HVAC Systems

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
92	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
93	Valve Body	Structural integrity	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.I-11	3.3.1-58	A

Insert new rows 94 through 99 for Table 3.3.2-36 as shown on page 3.3-328a

W41

Table 3.3.2-36 Aging Management Review Results – Radwaste Building HVAC Systems

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
94	Air-Handling Unit Housing (WMA-AH-51A/B)	Pressure boundary	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	C0302
95	Air-Handling Unit Housing (WMA-AH-51A/B)	Pressure boundary	Steel	Condensation (Internal)	Loss of material	Cooling Units Inspection	VII.G-23	3.3.1-71	E0326
96	Air-Handling Unit Housing (WMA-AH-51A/B)	Pressure boundary	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
97	Bolting	Pressure boundary	Steel	Soil (External)	Cracking	Buried Piping and Tanks Inspection	N/A	N/A	G
98	Bolting	Pressure boundary	Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	N/A	N/A	G
99	Bolting	Pressure boundary	Steel	Soil (External)	Loss of pre-load	Buried Piping and Tanks Inspection	N/A	N/A	G

W 42

Table 3.3.2-42 Aging Management Review Results – Standby Service Water System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
105	Valve Body	Structural integrity	Stainless Steel	Air-indoor uncontrolled (Internal)	None	None	VII.J-15	3.3.1-94	A 0306
106	Valve Body	Structural integrity	Stainless Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-15	3.3.1-79	B
107	Valve Body	Structural integrity	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A
108	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	C 0302
109	Valve Body	Structural integrity	Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-19	3.3.1-76	B
110	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A

Add new rows 111 through 116 shown on page 3.3-390a

Amendment 1

W 42

Table 3.3.2-42 Aging Management Review Results – Standby Service Water System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
111	Bolting	Pressure boundary	Steel	Soil (External)	Cracking	Buried Piping and Tanks Inspection	N/A	N/A	G
112	Bolting	Pressure boundary	Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	N/A	N/A	G
113	Bolting	Pressure boundary	Steel	Soil (External)	Loss of pre-load	Buried Piping and Tanks Inspection	N/A	N/A	G
114	Orifice	Pressure boundary	Stainless Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	VII.C1-16	3.3.1-29	E
115	Piping	Pressure boundary	Stainless Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	VII.C1-16	3.3.1-29	E
116	Valve body	Pressure boundary	Stainless Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	VII.C1-16	3.3.1-29	E

Table 3.3.2-43 Aging Management Review Results – Tower Makeup Water System									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
37	Valve Body	Pressure boundary	Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-19	3.3.1-76	B
38	Valve Body	Pressure boundary	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
39	Valve Body	Pressure boundary	Steel	Air-outdoor (External)	Loss of material	External Surfaces Monitoring	VII.I-9	3.3.1-58	A
40	Valve Body	Pressure boundary	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.I-11	3.3.1-58	A

Insert new rows 41 through 44 for Table 3.3.2-43 as shown on page 3.3-395a

W43

Table 3.3.2-43 Aging Management Review Results – Tower Makeup Water System									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
41	Bolting	Pressure boundary	Steel	Soil (External)	Cracking	Buried Piping and Tanks Inspection	N/A	N/A	G
42	Bolting	Pressure boundary	Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	N/A	N/A	G
43	Bolting	Pressure boundary	Steel	Soil (External)	Loss of pre-load	Buried Piping and Tanks Inspection	N/A	N/A	G
44	Valve Body	Pressure boundary	Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	VII.C1-18	3.3.1-19	A

W 44-1

- Structural components that are safety-related and are relied upon to remain functional during and following design basis events.
- Structural components that are NSR whose failure could prevent satisfactory accomplishment of safety-related functions.
- Structural components that are relied on during postulated fires, anticipated transients without scram, and station blackout events.

FSAR References

Section 3.8.4 of the FSAR describes the Diesel Generator Building.

Components Subject to AMR

Table 2.4-5 lists the component types that require AMR and their intended functions.

The structural commodities for the Diesel Generator Building are addressed in the bulk commodities evaluation in Section 2.4.13.

Table 3.5.2-5, Aging Management Review Results - Diesel Generator Building, provides the results of the AMR.

Table 2.4-5
Diesel Generator Building
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Battery Racks	SSR
Diesel Generator Exhaust Plenums	EN, MB, SRE, SSR
Diesel Generator Intake Plenums	EN, MB, SRE, SSR
Diesel Generator Pedestals	EXP, EN, SSR
Exterior Walls (above grade)	EN, MB, SRE, SSR
Foundations	EN, EXP, SRE, SSR
Reinforced Concrete: Walls, Floors, and Ceilings	EN, FB, MB, SRE, SSR
Roof	EN, MB, SRE, SSR
Structural Steel: Beams, Columns, Plates, and Trusses (includes welds and bolted connections)	EN, SSR

Add new table row from Insert A shown on page 2.4-24a

W44-1

Insert A to page 2.4-24

Table 2.4-5
Diesel Generator Building
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
South Exterior Slab	SRE

W44-2

Table 3.5.2-5 Aging Management Review Results – Diesel Generator Building

Row No.	Component / Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
10	Roof	EN, MB, SRE, SSR	Concrete	Air-indoor	None	Structures Monitoring Program	N/A	N/A	I 0501 0526

1 Refer to Table 2.0-1 for intended function descriptions.

Add new rows 11 and 12 to Table 3.5.2-5 shown on page 3.5-98a

Amendment 1

W44-2

Insert A to page 3.5-98

Table 3.5.2-5 Aging Management Review Results – Diesel Generator Building

Row No.	Component / Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
11	South Exterior Slab	SRE	Concrete	Air-outdoor	None	Structures Monitoring Program	N/A	N/A	I 0501
12	South Exterior Slab	SRE	Concrete	Soil	None	Structures Monitoring Program	N/A	N/A	I 0501

W 48

Table 2.2-1
License Renewal Scoping Results for Mechanical Systems (continued)

System Name	In Scope?	Screening Results Section
Radwaste Building Chilled Water	Yes	2.3.3.36
Radwaste Building Exhaust Air	Yes	2.3.3.37
Radwaste Building Heating Condensate	No	
Radwaste Building Mixed Air	Yes	2.3.3.37
Radwaste Building Outside Air	Yes	2.3.3.37
Radwaste Building Potable Hot Water	No	
Radwaste Building Refrigeration	No	
Radwaste Building Return Air	Yes	2.3.3.37
Reactor Building Exhaust Air	Yes	2.3.3.38
Reactor Building Outside Air	Yes	2.3.3.38
~~Reactor Building Potable Hot Water~~	~~No~~	
Reactor Building Return Air (Emergency Cooling)	Yes	2.3.3.38
Reactor Closed Cooling Water	Yes	2.3.3.39
Reactor Core Isolation Cooling	Yes	2.3.2.2
Reactor Feedwater	Yes	2.3.4.7
Reactor Feedwater Turbine	No	
Reactor Protection System	Yes	2.3.3.40
Reactor Recirculation	Yes	2.3.1.3
Reactor Service Equipment	No	
Reactor Water Cleanup	Yes	2.3.3.41
Residual Heat Removal	Yes	2.3.2.1
Roof Drains	Yes	2.3.3.23
Reactor Recirculation Hydraulic Control	No	
Sampling	Yes	2.3.3.34
Seal Oil	No	
Sealing Steam	Yes ~~No~~	2.3.4.8
Service Air	Yes	2.3.3.42
Service Building Chilled Water	No	

License Renewal Application

Amendment 1

Changed Sections and Page Number			
Section	**Page Number**	**Change Number**	**Type***
Table 2.2-1	2.2-4	28	W
Table 2.2-1	2.2-4	29	W
Table 2.2-1	2.2-4	30	W
Table 2.2-1	2.2-6	48	W
Table 2.2-1	2.2-6	35	W
2.3.2.3	2.3-24	13	R
2.3.2.3	2.3-24a	13	R
2.3.3	2.3-35	28	W
2.3.3	2.3-35	29	W
2.3.3	2.3-35	30	W
2.3.3.1	2.3-37	37	W
Table 2.3.3-1	2.3-37	37	W
2.3.3.1	2.3-37a	37	W
2.3.3.2	2.3-38	24	W
2.3.3.10	2.3-57	21	W
2.3.3.18	2.3-80	14	R
2.3.3.18	2.3-80a	14	R

* E=Editorial - Summarized in Attachment 1
O= Operating experience update review - Summarized in Attachment 2
R=Reference revision review update - Summarized in Attachment 3
W=Walkdown changes - Summarized in Attachment 4

Changed Sections and Page Number			
Section	**Page Number**	**Change Number**	**Type***
2.3.3.21	2.3-90	26	W
Table 2.3.3-21	2.3-91	26	W
Table 2.3.3-21	2.3-91a	26	W
2.3.3.22	2.3-95	45	R
2.3.3.22	2.3-96	45	R
2.3.3.22	2.3-96	49	E
Table 2.3.3-22	2.3-97	45	R
Table 2.3.3-22	2.3-97a	45	R
2.3.3.23	2.3-98	25	W
2.3.3.24	2.3-101	27	W
Table 2.3.3-24	2.3-102	27	W
Table 2.3.3-24	2.3-102a	27	W
2.3.3.27	2.3-108	31	W
2.3.3.29	2.3-113	36	W
Table 2.3.3-30	2.3-117	32	W
Table 2.3.3-30	2.3-117a	32	W
2.3.3.41	2.3-146	34	W
2.3.3.48	2.3-162	28	W
2.3.3.48	2.3-162a	28	W

Changed Sections and Page Number			
Section	**Page Number**	**Change Number**	**Type***
2.3.3.48	2.3-162b	28	W
2.3.3.49	2.3-162c	29	W
2.3.3.49	2.3-162d	29	W
2.3.3.50	2.3-162e	30	W
2.3.3.50	2.3-162f	30	W
2.3.4	2.3-163	35	W
2.3.4.2	2.3-166	22	W
Table 2.3.4-2	2.3-167	22	W
Table 2.3.4-2	2.3-167a	22	W
2.3.4.3	2.3-169	23	W
Table 2.3.4-3	2.3-170	23	W
Table 2.3.4-3	2.3-170a	23	W
2.3.4.8	2.3-180	35	W
2.3.4.8	2.3-180a	35	W
2.3.4.8	2.3-180b	35	W
2.4.4	2.4-21	12	R
Table 2.4-5	2.4-24	44	W
Table 2.4-5	2.4-24a	44	W
2.5.3	2.5-3	1	E

Changed Sections and Page Number			
Section	**Page Number**	**Change Number**	**Type***
2.5.6.2	2.5-8	2	E
3.3.1	3.3-2	28	W
3.3.1	3.3-2a	28	W
3.3.1	3.3-2	29	W
3.3.1	3.3-2a	29	W
3.3.1	3.3-2	30	W
3.3.1	3.3-2a	30	W
3.3.2	3.3-5	28	W
3.3.2	3.3-5a	28	W
3.3.2	3.3-5	29	W
3.3.2	3.3-5a	29	W
3.3.2	3.3-5	30	W
3.3.2	3.3-5a	30	W
3.3.2.1.1	3.3-6	37	W
3.3.2.1.21	3.3-25	26	W
3.3.2.1.24	3.3-29	27	W
3.3.2.1.29	3.3-34	7	R
3.3.2.1.32	3.3-36	9	R
3.3.2.1.45	3.3-50	28	W

Changed Sections and Page Number			
Section	**Page Number**	**Change Number**	**Type***
3.3.2.1.45	3.3-50a	28	W
3.3.2.1.45	3.3-50b	28	W
3.3.2.1.46	3.3-50b	29	W
3.3.2.1.46	3.3-50c	29	W
3.3.2.1.47	3.3-50c	30	W
3.3.2.1.47	3.3-50d	30	W
3.3.2.2.11	3.3-55	28	W
3.3.2.2.11	3.3-55a	28	W
3.3.2.2.11	3.3-55	29	W
3.3.2.2.11	3.3-55a	29	W
3.3.2.2.11	3.3-55	30	W
3.3.2.2.11	3.3-55a	30	W
3.3.2.2.10.7	3.3-55a	38	W
3.3.2.2.10.7	3.3-55a	38	W
Table 3.3.1, Item 3.3.1-29	3.3-75	38	W
Table 3.3.1, Item 3.3.1-29	3.3-75a	38	W
Table 3.3.1, Item 3.3.1-31	3.3-77	29	W
Table 3.3.1, Item 3.3.1-31	3.3-77a	29	W

Changed Sections and Page Number			
Section	**Page Number**	**Change Number**	**Type***
Table 3.3.1, Item 3.3.1-71	3.3-101	29	W
Table 3.3.1, Item 3.3.1-71	3.3-101a	29	W
Table 3.3-1, Item 3.3.1-76	3.3-104	26	W
Table 3.3.1, Item 3.3.1-85	3.3-113	29	W
Table 3.3.1, item 3.3.1-94	3.3-115	28	W
Table 3.3.2-1, rows 8 & 9,	3.3-118	37	W
Table 3.3.2-1, new rows 15-21	3.3-119	37	W
Table 3.3.2-1, new rows 15-21	3.3-119a	37	W
Table 3.3.2-14, row 24	3.3-180	7	R
Table 3.3.2-14, row 25	3.3-181	7	R
Table 3.3.2-18, new rows 81-86	3.3-215	39	W
Table 3.3.2-18, new rows 81-86	3.3-215a	39	W
Table 3.3.3-21, Insert new rows 54-60	3.3-232	26	W

Changed Sections and Page Number			
Section	**Page Number**	**Change Number**	**Type***
Table 3.3.3-21, Insert new rows 54-60	3.3-232a	26	W
Table 3.3.2-22, Row 120	3.3-248	46	R
Table 3.3.2-22, Rows 123, 124, & 127	3.3-249	46	R
Table 3.3.2-22, new rows 181-183	3.3-256	40	W
Table 3.3.2-22, new rows 181-183	3.3-256a	40	W
Table 3.3.2-24, new rows 42-47	3.3-263	27	W
Table 3.3.2-24, new rows 42-47	3.3-263a	27	W
Table 3.3.2-29, row 18	3.3-287	7	R
Table 3.3.2-29, row 19	3.3-288	7	R
Table 3.3.2-30, new rows 11-13	3.3-291	32	W
Table 3.3.2-30 new rows 11-13	3.3-291a	32	W
Table 3.3.2-32, row 16	3.3-294	9	R
Table 3.3.2-34, rows 36 & 37	3.3-307	7	R

Changed Sections and Page Number			
Section	**Page Number**	**Change Number**	**Type***
Table 3.3.2-34, row 45	3.3-308	7	R
Table 3.3.2-34, row 46	3.3-309	7	R
Table 3.3.2-36, rows 1 & 2	3.3-315	16	O
Table 3.3.2-36, row 41	3.3-320	7	R
Table 3.3.2-36, row 42	3.3-321	7	R
Table 3.3.2-36, row 66	3.3-325	6	R
Table 3.3.2-36, new rows 94, 95, & 96	3.3-328	16	O
Table 3.3.2-36, new rows 94, 95, & 96	3.3-328a	16	O
Table 3.3.2-36, new rows 97, 98, & 99	3.3-328	41	W
Table 3.3.2-36, new rows 97, 98 & 99	3.3-328a	41	W
Table 3.3.2-37, row 36	3.3-333	7	R
Table 3.3.2-37, rows 37	3.3-334	7	R
Table 3.3.2-37, rows 37 & 38	3.3-334	8	R
Table 3.3.2-37, new rows 86 & 87	3.3-340	9	R

Changed Sections and Page Number			
Section	**Page Number**	**Change Number**	**Type***
Table 3.3.2-37, new rows 86 & 87	3.3-340a	9	R
Table 3.3.2-42, new rows 111-116	3.3-390	42	W
Table 3.3.2-42, new rows 111-116	3.3-390a	42	W
Table 3.3.2-43, new rows 41-44	3.3-395	43	W
Table 3.3.2-43, new rows 41-44	3.3-395a	43	W
Table 3.3.2-45	3.3-397	28	W
Table 3.3.2-45	3.3-397a	28	W
Table 3.3.2-45	3.3-397b	28	W
Table 3.3.2-45	3.3-397c	28	W
Table 3.3.2-45	3.3-397d	28	W
Table 3.3.2-45	3.3-397e	28	W
Table 3.3.2-45	3.3-397f	28	W
Table 3.3.2-45	3.3-397g	28	W
Table 3.3.2-46	3.3-397	29	W
Table 3.3.2-46	3.3-397h	29	W
Table 3.3.2-46	3.3-397i	29	W

Changed Sections and Page Number			
Section	**Page Number**	**Change Number**	**Type***
Table 3.3.2-46	3.3-397j	29	W
Table 3.3.2-46	3.3-397k	29	W
Table 3.3.2-46	3.3-397l	29	W
Table 3.3.2-46	3.3-397m	29	W
Table 3.3.2-47	3.3-397	30	W
Table 3.3.2-47	3.3-397n	30	W
Table 3.3.2-xx, plant specific note 0325	3.3-400	7	R
Table 3.3.2-xx, plant specific note 0325	3.3-400a	7	R
Table 3.3.2-xx, Plant specific note 326	3.3-400	16	O
Table 3.3.2-xx, Plant specific note 326	3.3-400a	16	O
Table 3.3.2-xx, Plant specific note 327	3.3-400	46	R
Table 3.3.2-xx, Plant specific note 327	3.3-400a	46	R
3.4.1	3.4-1	35	W
3.4.1	3.4-1a	35	W
3.4.2	3.4-1	35	W

Changed Sections and Page Number			
Section	**Page Number**	**Change Number**	**Type***
3.4.2	3.4-1a	35	W
3.4.2.1.2	3.4-3	22	W
3.4.2.1.8	3.4-9	35	W
3.4.2.1.8	3.4-9a	35	W
Table 3.4.1, Item 3.4.1-04	3.4-14	22	W
Table 3.4.1, Item 3.4.1-04	3.4-14a	22	W
Table 3.4.2-2, new rows 21-25	3.4-43	22	W
Table 3.4.2-2, new rows 21-25	3.4-43a	22	W
Table 3.4.2-3, new rows 84-87	3.4-53	23	W
Table 3.4.2-3, new rows 84-87	3.4-53a	23	W
Table 3.4.2-8	3.4-76	35	W
Table 3.4.2-8	3.4-76a	35	W
Table 3.4.2-xx, plant specific note 0412	3.4-78	35	W
Table 3.5.2-5, new rows 11 & 12	3.5-98	44	W
Table 3.5.2-5, new rows 11 & 12	3.5-98a	44	W

Changed Sections and Page Number			
Section	**Page Number**	**Change Number**	**Type***
Table 4.3-2	4.3-4	15	R
Table 4.3-2	4.3-4a	15	R
A.1.2.5	A-9	38	W
A.1.2.5	A-9a	38	W
A.1.2.17	A-13	10	R
A.1.2.39	A-21	11	R
A.1.2.42	A-22	9	R
Table A-1, item 5	A-43	38	W
Table A-1, item 5	A-43a	38	W
Table A-1, Item 17	A-46	10	R
Table A-1, Item 23	A-49	6	R
Table A-1, Item 38	A-56	3	E
Table A-1, Item 39	A-56	11	R
Table B-2	B-23	11	R
B.2.3	B-35	17	O
B.2.5	B-39	38	W
B.2.5	B-39a	38	W
B.2.5	B-40	38	W

Changed Sections and Page Number			
Section	**Page Number**	**Change Number**	**Type***
B.2.5	B-40a	38	W
B.2.14	B-68	16	O
B.2.14	B-68a	16	O
B.2.17	B-77	10	R
B.2.17	B-78	10	R
B.2.23	B-101	6	R
B.2.23	B-102	6	R
B.2.23	B-103	6	R
B.2.28	B-120	4	E
B.2.29	B-123	18	O
B.2.39	B-153	11	R
B.2.39	B-154	11	R
B.2.39	B-154	47	O
B.2.40	B-158	19	O
B.2.41	B-160	9	R
B.2.41	B-160a	9	R
B.2.42	B-163	9	R
B.2.43	B-167	32	W
B.2.47	B-179	28	W

Changed Sections and Page Number			
Section	**Page Number**	**Change Number**	**Type***
B.2.47	B-179	29	W
B.2.50	B-196	5	E
B.2.50	B-196	20	O
B.2.50	B-196a	20	O
B.2.51	B-197	22	W
B.2.51	B-198	29	W
B.2.53	B-207	20	O

Table 2.2-1 License Renewal Scoping Results for Mechanical Systems (continued)		
System Name	**In Scope?**	**Screening Results Section**
Floor Drain Radioactive	Yes	2.3.3.24
Fuel Oil	Yes	2.3.3.18
Fuel Pool Cooling	Yes	2.3.3.25
Glycol	No	
Guard House Exhaust Air	No	
Guard House Fire Protection	No	
Guard House Mixed Air	No	
Guard House Outside Air	No	
Guard House Potable Hot Water	No	
Guard House Return Air	No	
Heater Drain	No	
Heater Vents	No	
Heating Hot Water	No	
Heating Steam	Yes ~~No~~	2.3.3.48
Heating Steam Condensate	Yes ~~No~~	2.3.3.49
Heating Steam Vent	Yes ~~No~~	2.3.3.50
High-Pressure Core Spray	Yes	2.3.2.3
Hydrogen	No	
Hydrogen Water Chemistry	No	
Independent Spent Fuel Storage Installation	No	
Instrument Rack	Yes	2.3.3.40
Isophase Bus Duct Cooling	No	
Laboratory Equipment (Permanent Plant)	No	
Leak Detection	Yes	2.3.3.26
Local Power Range Monitor	Yes	2.3.1.2
Low-Pressure Core Spray	Yes	2.3.2.4
Machine Shop Equipment	No	
Main Steam	Yes	2.3.4.4

Table 2.2-1
License Renewal Scoping Results for Mechanical Systems (continued)

System Name	In Scope?	Screening Results Section
Radwaste Building Chilled Water	Yes	2.3.3.36
Radwaste Building Exhaust Air	Yes	2.3.3.37
Radwaste Building Heating Condensate	No	
Radwaste Building Mixed Air	Yes	2.3.3.37
Radwaste Building Outside Air	Yes	2.3.3.37
Radwaste Building Potable Hot Water	No	
Radwaste Building Refrigeration	No	
Radwaste Building Return Air	Yes	2.3.3.37
Reactor Building Exhaust Air	Yes	2.3.3.38
Reactor Building Outside Air	Yes	2.3.3.38
~~Reactor Building Potable Hot Water~~	~~No~~	
Reactor Building Return Air (Emergency Cooling)	Yes	2.3.3.38
Reactor Closed Cooling Water	Yes	2.3.3.39
Reactor Core Isolation Cooling	Yes	2.3.2.2
Reactor Feedwater	Yes	2.3.4.7
Reactor Feedwater Turbine	No	
Reactor Protection System	Yes	2.3.3.40
Reactor Recirculation	Yes	2.3.1.3
Reactor Service Equipment	No	
Reactor Water Cleanup	Yes	2.3.3.41
Residual Heat Removal	Yes	2.3.2.1
Roof Drains	Yes	2.3.3.23
Reactor Recirculation Hydraulic Control	No	
Sampling	Yes	2.3.3.34
Seal Oil	No	
Sealing Steam	Yes ~~No~~	2.3.4.8
Service Air	Yes	2.3.3.42
Service Building Chilled Water	No	

2.3.2.3 High-Pressure Core Spray (HPCS) System

System Description

The HPCS System consists of a motor-driven centrifugal pump, a spray sparger in the reactor vessel located above the core (separate from the LPCS sparger), and associated system piping, valves, controls, and instrumentation. The HPCS System is designed to pump water into the reactor vessel over a wide range of vessel pressures. For small breaks that do not result in rapid depressurization, the system maintains reactor water level. For large breaks, the HPCS System cools the reactor core by spray. The HPCS System also provides for core cooling in the event of a station blackout. Suction piping is provided from the condensate storage tank and also from the suppression pool. The elevation of the HPCS pump is sufficiently below the water level of both the condensate storage tanks and the suppression pool to provide a flooded pump suction and to meet pump net positive suction head (NPSH) requirements with the containment at atmospheric pressure and post-accident debris entrained on the beds of the suction strainers.

The HPCS discharge line fill system is designed to maintain the pump discharge line in a filled condition to ensure the time between the signal to start the pump and the initiation of flow into the reactor vessel is minimized. To ensure that any leakage from the discharge line is replaced and the line is always kept full, a water leg pump system is provided.

Replace paragraph with Insert A shown on page 2.3-24a

Reason for Scope Determination

~~The HPCS System provides RPV spray cooling during a large-break LOCA that uncovers the core, maintains RPV water level during a small-break LOCA that does not depressurize the reactor vessel, provides Primary Containment isolation and integrity (including valve position indication), and maintains the reactor coolant pressure boundary integrity. All of these system-intended functions are safety-related. Therefore, the HPCS System meets the scoping criteria of 10 CFR 54.4(a)(1).~~

The HPCS System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The HPCS System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the HPCS System meets the scoping criteria of 10 CFR 54.4(a)(2).

The HPCS System is also relied upon to demonstrate compliance with, and meets the 10 CFR 54.4(a)(3) scoping criteria for, the Environmental Qualification (10 CFR 50.49), Anticipated Transients Without Scram (10 CFR 50.62), and Station Blackout (10 CFR 50.63) regulated events.

Insert A for LRA Page 2.3-24

The HPCS System provides RPV spray cooling during a large-break LOCA that uncovers the core, maintains RPV water level during a small-break LOCA that does not depressurize the reactor vessel, provides Primary Containment isolation and integrity (including valve position indication), provides Secondary Containment isolation and integrity (including valve position indication), and maintains the reactor coolant pressure boundary integrity. All of these system-intended functions are safety-related. Therefore, the HPCS System meets the scoping criteria of 10 CFR 54.4(a)(1).

Leak Detection (LD) System (Section 2.3.3.26)

Miscellaneous Waste Radioactive (MWR) System (Section 2.3.3.27)

Plant Sanitary Drains (PSD) System (Section 2.3.3.28)

Plant Service Water (TSW) System (Section 2.3.3.29)

Potable Cold Water (PWC) System (Section 2.3.3.30)

Potable Hot Water (PWH) System (Section 2.3.3.31)

Primary Containment (C) System (Section 2.3.3.32)

Process Sampling (PS) System (Section 2.3.3.33)

Process Sampling Radioactive (PSR) System (Section 2.3.3.34)

Pump House HVAC Systems (Section 2.3.3.35)

Radwaste Building Chilled Water (WCH) System (Section 2.3.3.36)

Radwaste Building HVAC Systems (Section 2.3.3.37)

Reactor Building HVAC Systems (Section 2.3.3.38)

Reactor Closed Cooling Water (RCC) System (Section 2.3.3.39)

Reactor Protection System (RPS) (Section 2.3.3.40)

Reactor Water Cleanup (RWCU) System (Section 2.3.3.41)

Service Air (SA) System (Section 2.3.3.42)

Standby Liquid Control (SLC) System (Section 2.3.3.43)

Standby Service Water (SW) System (Section 2.3.3.44)

Suppression Pool Temperature Monitoring (SPTM) System (Section 2.3.3.45)

Tower Makeup Water (TMU) System (Section 2.3.3.46)

Traversing Incore Probe (TIP) System (Section 2.3.3.47)

A brief system description, reason for scope determination, associated FSAR references, associated license renewal drawings, and components subject to AMR information are provided for each system.

Insert:
"Heating Steam (HS) System (Section 2.3.3.48)
Heating Steam Condensate (HCO) System (Section 2.3.3.49)
Heating Steam Vent (HSV) System (Section 2.3.3.50)"

Table 3.3.2-1, Aging Management Review Results – Circulating Water System, provides the results of the AMR.

Insert A from page 2.3-37a

Table 2.3.3-1
Circulating Water System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Bolting	Pressure Boundary
Piping	Pressure Boundary
~~Rupture disc~~	~~Pressure Boundary~~
Valve body	Pressure Boundary

Insert A to page 2.3-37

Per FSAR Section 9.2.5.3, if the service water spray headers are damaged by a tornado-generated missile, cooling is provided by a feed-and-bleed mode of operation. In the feed-and-bleed mode, cooling water is supplied to the spray ponds from the makeup water pump house. The service water system takes suction from the spray ponds to provide cooling to safe shutdown equipment. The cooling water is then routed to tornado-protected underground circulating water piping and discharged to the circulating water basin. Since rupture disks CW-RD-1A/B are located in the circulating water basin, their failure will not prevent the Circulating Water System from performing its intended function. Since the rupture disks do not perform a license renewal intended function, they are not subject to AMR.

2.3.3.2 Condensate Processing Radioactive (Demineralizer) (CPR) System

System Description

The CPR System, also referred to as the Condensate Filter Demineralizer System, is designed to maintain feedwater quality such that the reactor water limits are not exceeded. The system removes corrosion products, condenser inleakage impurities, and impurities present in the condensed steam. The system controls the condensate impurity concentration during plant operation. The system functions as a chemical mixing and supply system to clean the filter demineralizer units and direct the waste to the chemical waste system, as a backwash system to remove the spent resin from the filter demineralizers and direct the waste to the backwash receiving tank, and as a precoat system to circulate fresh precoat material through the filter demineralizers.

Reason for Scope Determination

The CPR System does not perform any safety-related system-intended functions that meet the scoping criteria of 10 CFR 54.4(a)(1).

The CPR System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The CPR System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the CPR System meets the scoping criterion of 10 CFR 54.4(a)(2).

The CPR System is not relied upon to demonstrate compliance with the 10 CFR 54.4(a)(3) scoping criteria for any regulated events.

FSAR References

Section 10.4.6 of the FSAR describes the Condensate Filter Demineralizer System, evaluated for license renewal as the Condensate Processing Radioactive (Demineralizer) System.

License Renewal Drawings

The following license renewal drawings depict the evaluation boundaries for the system components within the scope of license renewal:

LR-M523-1, LR-M526-1 Insert: ", LR-M536"

Components Subject to AMR

Table 2.3.3-2 lists the component types that require AMR and their intended functions.

Table 3.3.2-2, Aging Management Review Results – Condensate Processing Radioactive (Demineralizer) System, provides the results of the AMR.

2.3.3.10 Control Air System (CAS)

System Description

The CAS provides oil-free, filtered, and dried instrument-quality air throughout the plant for pneumatic instrumentation, controls, and actuators. The CAS also provides air to the outboard MSIV accumulators, and to the wetwell vacuum breaker solenoid pilot valves. The system is designed to provide uninterrupted service during normal plant operation.

The air receivers store compressed air to serve associated pneumatic loads. The Cooling Jacket Water (CJW) System is a closed water system provided to cool the three CAS compressors and the two CAS refrigerated dryers. Operation of CAS is not required for the initiation of any engineered safeguard system or for safe shutdown of the reactor, but is required for continuous plant operation. Based on this, operation of the CAS is not required for mitigation of a design basis accident or abnormal operational transient.

Reason for Scope Determination

The CAS provides Primary Containment isolation and integrity. This system-intended function is safety-related. Therefore, the CAS meets the scoping criteria of 10 CFR 54.4(a)(1).

The CAS does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The CAS does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the CAS meets the scoping criteria of 10 CFR 54.4(a)(2).

The CAS is not relied upon to demonstrate compliance with the 10 CFR 54.4(a)(3) scoping criteria for any regulated events.

FSAR References

Sections 9.3.1.1.1 and 9.3.1.3.1 of the FSAR describe the Control Air System.

License Renewal Drawings

The following license renewal drawings depict the evaluation boundaries for the system components within the scope of license renewal:

LR-M510-2, LR-M510-2A

Insert: ", LR-M532"

Components Subject to AMR

Table 2.3.3-10 lists the component types that require AMR and their intended functions.

2.3.3.18 Diesel Fuel Oil (DO) System

System Description

The DO System consists of separate, independent diesel oil supply systems serving each of the diesel generators. Each of these systems consists of a fuel oil storage tank, a transfer pump, a day tank, interconnecting piping and valves, and associated instruments and controls.

The auxiliary boiler fuel oil storage tank (FO-TK-1) is used as an additional storage tank for the emergency diesel generator fuel oil storage and transfer system. This tank is maintained to the same cleanliness requirements as the other Class I fuel oil tanks. The diesel fuel oil stored in this tank is surveyed to the same requirements as the fuel oil in the other diesel storage tanks. Replace paragraph with Insert A shown on page 2.3-80a

~~The fuel oil supply from the day tanks to each diesel engine consists of two mutually redundant systems. Either system is capable of supplying fuel oil to the engine. Each system contains a fuel oil supply line strainer, fuel oil pump, duplex filter, pressure gauge, and relief and check valves.~~

One of the fuel oil supply pumps is mechanically driven by the engine and is normally used during engine operation. The other supply pump is driven by a 120-V DC motor and is used to fill the fuel oil system and fuel header prior to initial operation and after maintenance has been performed on system piping and components. The DC-motor-driven pump runs during engine operation in the event fuel supply through the engine-driven pump system fails. Add new paragraph from Insert B shown on page 2.3-80a

Reason for Scope Determination

The DO System provides fuel oil to enable the emergency diesel generators to start, run, and load. This system-intended function is safety-related. Therefore, the DO System meets the scoping criteria of 10 CFR 54.4(a)(1).

The DO System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The DO System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the DO System meets the scoping criteria of 10 CFR 54.4(a)(2).

The DO System is relied upon to demonstrate compliance with, and meets the 10 CFR 54.4(a)(3) scoping criteria for, the Fire Protection (10 CFR 50.48), Anticipated Transients Without Scram (10 CFR 50.62), and Station Blackout (10 CFR 50.63) regulated events.

Insert A for LRA Page 2.3-80

The fuel oil supply from the day tanks to each diesel engine consists of two systems. Either system is capable of supplying fuel oil to the engine. For diesel generator sets 1 and 2, each system contains a fuel supply line strainer, fuel oil pump, duplex filter, pressure gauge, relief and check valves, and separate fuel return lines to the day tanks.

Insert B for LRA Page 2.3-80

For the HPCS diesel generator, there are two fuel oil systems external to the engine fuel manifolds, either of which is capable of supplying fuel oil to the engine. One of the fuel oil pumps is mechanically driven by the engine and the other by a 120-V DC motor. The systems contain the following components from the day tank: fuel supply lines, strainers, fuel oil pumps, duplex filters, and relief and check valves. The two systems join together at the manifold for the duplex filter of the engine-driven fuel oil pump and share that duplex filter, a pressure gage, fuel lines and manifolds to the injectors, injectors, and a return line to the day tank.

Reason for Scope Determination

The EDR System provides Primary Containment isolation and integrity (including valve position indication), and secondary containment isolation and integrity (including valve position indication). These system-intended functions are safety-related. Therefore, the EDR System meet the scoping criteria of 10 CFR 54.4(a)(1).

The EDR System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The EDR System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the EDR System meets the scoping criteria of 10 CFR 54.4(a)(2).

The EDR System is relied upon to demonstrate compliance with, and meets the 10 CFR 54.4(a)(3) scoping criteria for, the Environmental Qualification (10 CFR 50.49) regulated event.

FSAR References

Section 9.3.3.2.1 of the FSAR describes the Radioactive Equipment Drainage System, evaluated for license renewal as the Equipment Drains Radioactive System.

License Renewal Drawings

The following license renewal drawings depict the evaluation boundaries for the system components within the scope of license renewal:

Insert: ", LR-M532"

LR-M521-2, LR-M523-2, LR-M537, LR-M539

Components Subject to AMR

Table 2.3.3-21 lists the component types that require AMR and their intended functions.

Table 3.3.2-21, Aging Management Review Results – Equipment Drains Radioactive System, provides the results of the AMR.

Solenoid pilot valves and the associated air lines provide a control air supply to actuators for the primary and secondary containment isolation valves (EDR-V-19, EDR-V-20, EDR-V-394, and EDR-V-395). Failure of the air supply places the valve in a safe position that supports the system function. Therefore, pressure boundary integrity is not a required component intended function of these solenoid valves, air supply lines, or actuators for the system to perform its intended function. Since these components have no other component intended function, they are not subject to AMR.

The external subcomponents (shell and channel covers) of the in-scope heat exchangers will contain fluid leakage in the event of a failure of an internal subcomponent (tubes and tubesheet). Failure of an internal subcomponent will therefore not create the potential for spatial interaction that could prevent a safety-related SSC from performing its intended function. As a result, the internal subcomponents (tubes and tubesheet) of the in-scope heat exchangers are not subject to AMR.

Table 2.3.3-21
Equipment Drains Radioactive System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Bolting	Pressure Boundary Structural Integrity
Heat exchanger (channel and shell)	Structural Integrity
Orifice	Structural Integrity
Piping	Pressure Boundary Structural Integrity
Sight glass	Structural Integrity
Tubing	Structural Integrity
Valve body	Pressure Boundary Structural Integrity

Insert A from page 2.3-91a

Insert A to Table 2.3.3-21:

Pump casing	Structural Integrity
Tank	Structural Integrity

The Carbon Dioxide and Dry Chemical Fire Suppression systems do not contain components that perform a license renewal intended function, and therefore are not within the scope of license renewal.

The diesel fuel oil lines that supply fuel oil to the fire protection pump diesels, designated as DO on the drawings, and the fire protection pump diesel engine exhaust piping, designated as DE on the drawings, are within the evaluation boundaries of the Fire Protection System.

Components Subject to AMR

Table 2.3.3-22 lists the component types that require AMR and their intended functions.

Table 3.3.2-22, Aging Management Review Results – Fire Protection System, provides the results of the AMR.

Portable fire extinguishers are within the scope of license renewal. However, they are periodically inspected and hydrostatically tested, and are replaced if they do not pass an inspection or test. Portable fire extinguishers are short-lived components, subject to replacement based on a qualified life or specified time period, and not subject to AMR.

Fire and smoke detectors, and alarm devices, do not perform a passive mechanical function for the purpose of license renewal. Electrical components that are subject to AMR (the cables for the detectors and alarms) are addressed in Section 2.5.

Fire barriers, fire dampers, fire doors, and fire penetration seals determined to be within the scope of license renewal and subject to AMR are addressed as structural commodities in Section 2.4.13.

Fire hoses are within the scope of license renewal. However, they are periodically inspected to ensure that they are in an acceptable operating condition. These ongoing hose station inspections (together with the associated action to repair or replace any fire hose noted to be in a deteriorated condition) establish a qualified life for the hoses. Therefore, the fire hoses are not subject to AMR.

The pre-action sprinkler systems are connected to the Control Air System. A failure of the air system will place the sprinkler system in a safe position. That is, the fusible link closed sprinkler heads will maintain water inventory in the piping and the sprinkler system will still be able to perform its system-intended function. Therefore, since this portion of the Control Air System, and associated components, does not have any other component intended function, the portion of the air system included within the Fire Protection System boundary is not subject to AMR.

Insert: "fire pump"

The diesel engines, except for the attached heat exchanger, are evaluated as active components and not subject to AMR.

~~The jockey pumps are not essential fire protection equipment per Columbia Licensee Controlled Specifications (LCS) 1.10.1. Therefore, since the jockey pumps do not have a component intended function, they are not subject to AMR.~~

(DOT)

Halon cylinders are within the scope of license renewal. The principal design criterion for these bottles is Department of Transportation Standards. The halon cylinders comply with the requirements of the DOT standards. The halon cylinders are consumables, replaced periodically in accordance with DOT standards, and are not subject to AMR.

The Fire Protection bladder tank (FP-TK-110) is within the scope of license renewal. However, it has a service life of approximately 20 years and was replaced accordingly in 2008. The replacement tank is of a similar design, with the same limited service life, and is subject to inspections to ensure its timely replacement. The bladder tank is short-lived, subject to replacement based on a qualified life or specified time period, and is not subject to AMR.

Table 2.3.3-22
Fire Protection System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Bolting	Pressure Boundary Structural Integrity
Exhaust silencer	Pressure Boundary
Flexible connection	Pressure Boundary
Heat exchanger (shell)	Pressure Boundary
Heat exchanger (tubes)	Heat Transfer Pressure Boundary
Hydrant	Pressure Boundary
Orifice	Pressure Boundary Throttling
Piping	Pressure Boundary Structural Integrity
Pump casing	Pressure Boundary
Spray nozzle	Pressure Boundary Spray
Sight glass	Pressure Boundary
~~Strainer (body and screen)~~	~~Filtration~~ ~~Pressure Boundary~~
Tank	Pressure Boundary
Tubing	Pressure Boundary Structural Integrity
Valve body	Pressure Boundary Structural Integrity

Replace this table row with "Insert A" from page 2.3-97a

Insert A for LRA Page 2.3-97

Strainer (body)	Pressure boundary
Strainer (screen)	Filtration

2.3.3.23 Floor Drain (FD) System

System Description

The FD System consists of non-radioactive floor drain subsystems in the Service Building and Turbine Building.

Floor drains from normally uncontaminated areas of the Turbine Building are collected in three sumps. All three sumps are routed to the Radwaste System for processing.

Floor drains in the Service Building are collected in a single sump containing two sump pumps. Water collected in the Service Building floor drain sump is pumped to the storm water drainage system. Water collected by the storm water drainage system is conveyed by a concrete pipe to a point approximately 1,500 feet northeast of the plant. The pipe discharges to an earthen channel that carries the water to a small unlined evaporation and percolation pond. Roof drains, which are evaluated as part of the FD System, are drained by gravity or pumped to the storm drain system.

Reason for Scope Determination

The FD System contains components designated as safety-related by Columbia choice. Therefore, the FD System meets the scoping criteria of 10 CFR 54.4(a)(1).

The FD System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The FD System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the FD System meets the scoping criteria of 10 CFR 54.4(a)(2).

The FD System is not relied upon to demonstrate compliance with any regulated event and does not meet the 10 CFR 54.4(a)(3) scoping criteria.

FSAR References

Section 9.3.3.2.3 of the FSAR describes the Nonradioactive Water Drainage System, and the Roof Drain System, evaluated collectively for license renewal as the Floor Drain System.

License Renewal Drawings

The following license renewal drawings depict the evaluation boundaries for the system components within the scope of license renewal:

Insert: ", LR-M531"

LR-M539, LR-M540, LR-M788-1, LR-M852, LR-216-01,3682

FDR-V-3 and FDR-V-4). These system-intended functions are safety-related. Therefore, the FDR System meets the scoping criteria of 10 CFR 54.4(a)(1).

The FDR System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The FDR System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the FDR System meets the scoping criteria of 10 CFR 54.4(a)(2).

The FDR System is relied upon to demonstrate compliance with, and meets the 10 CFR 54.4(a)(3) scoping criteria for, the Environmental Qualification (10 CFR 50.49) regulated event.

FSAR References

Section 9.3.3.2.2 of the FSAR describes the Radioactive Floor Drainage Subsystem, evaluated for license renewal as the Floor Drain Radioactive System.

License Renewal Drawings

The following license renewal drawing depicts the evaluation boundaries for the system components within the scope of license renewal:

LR-M539 Insert: ", LR-M531"

Components Subject to AMR

Table 2.3.3-24 lists the component types that require AMR and their intended functions.

Table 3.3.2-24, Aging Management Review Results – Floor Drain Radioactive System, provides the results of the AMR.

Solenoid pilot valves and associated air lines provide a control air supply to actuators for the primary and secondary containment isolation valves (FDR-V-3, 4, and 219 through 222). Failure of the air supply places the valve in a safe position that supports the system function. Therefore, pressure boundary integrity is not a required component intended function of these solenoid valves, air supply lines, or actuators for the system to perform its intended function. Since these components have no other component intended function, they are not subject to AMR.

Spectacle flanges (FDR-SF-1 and 2) are normally open. As such the spectacle does not perform any license renewal function and is not subject to AMR. The flange portion of the component is evaluated as piping.

Table 2.3.3-24
Floor Drain Radioactive System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Bolting	Pressure Boundary Structural Integrity
Orifice	Structural Integrity
Piping	Pressure Boundary Structural Integrity
Tubing	Structural Integrity
Valve body	Pressure Boundary Structural Integrity

Insert A from page 2.3-102a

Insert A to Table 2.3.3-24:

Pump casing	Structural Integrity
Tank	Structural Integrity

2.3.3.27 Miscellaneous Waste Radioactive (MWR) System

System Description

The MWR System is designed to collect water in the Reactor, Turbine, and Radwaste buildings that can contain potentially radioactive detergent and transfer the fluid directly by gravity to the Radwaste Building sump or the detergent drain tanks. It is also used to drain the decontamination solution in the Reactor Building from the decontamination pit and Reactor Closed Cooling Water chemical addition tank to the chemical waste tanks. Additionally the system also consists of SLC System drains. These equipment and floor drains collect borated water from the SLC System and direct it to 55-gallon drums located in the Reactor Building.

Reason for Scope Determination

The MWR System provides Primary Containment isolation and integrity, and secondary containment isolation and integrity. These system-intended functions are safety-related. Therefore, the MWR System meet the scoping criteria of 10 CFR 54.4(a)(1).

The MWR System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The MWR System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the MWR System meets the scoping criteria of 10 CFR 54.4(a)(2).

The MWR System is not relied upon to demonstrate compliance with the 10 CFR 54.4(a)(3) scoping criteria for any regulated events.

FSAR References

Section 11.2 of the FSAR describes the Liquid Waste Management System, evaluated for license renewal as the MWR System

License Renewal Drawings

The following license renewal drawing depicts the evaluation boundaries for the system components within the scope of license renewal:

LR-M539

Insert: ", LR-M531, LR-M533-1, LR-M533-2"

Components Subject to AMR

Table 2.3.3-26 lists the component types that require AMR and their intended functions.

Table 3.3.2-26, Aging Management Review Results – Miscellaneous Waste Radioactive System, provides the results of the AMR.

License Renewal Drawings

The following license renewal drawings depict the evaluation boundaries for the system components within the scope of license renewal:

LR-M508-1, LR-M548-2 Insert: ", LR-M508-2"

Components Subject to AMR

Table 2.3.3-28 lists the component types that require AMR and their intended functions.

Table 3.3.2-28, Aging Management Review Results – Plant Service Water System, provides the results of the AMR.

Table 2.3.3-28
Plant Service Water System
Components Subject to Aging Management Review

Component Type	**Intended Function (as defined in Table 2.0-1)**
Annubar	Structural Integrity
Bolting	Structural Integrity
Flow indicator (inline)	Structural Integrity
Orifice	Structural Integrity
Piping	Structural Integrity
Strainer (body)	Structural Integrity
Tubing	Structural Integrity
Valve body	Structural Integrity

before adverse consequences (i.e., interaction with safety-related structures and components) would manifest. Therefore, plumbing fixtures are not subject to AMR.

Table 2.3.3-30
Potable Hot Water System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Piping	Structural Integrity
Shock suppressor	Structural Integrity
Valve body	Structural Integrity

Insert A from page 2.3-117a

Insert A to Table 2.3.3-30:

Tubing	Structural Integrity

FSAR References

Section 5.4.8 of the FSAR describes the Reactor Water Cleanup System.

License Renewal Drawings

The following license renewal drawings depict the evaluation boundaries for the system components within the scope of license renewal:

Insert: ", LR-M536"

LR-M523-1, LR-M523-2

Portions of the RWCU System are in the Radwaste Building and outside of the control room tower boundary; as such these components are outside the scope of license renewal. This includes the filter demineralizer subsystem and its associated demineralizers, piping, pumps, and tanks.

Components Subject to AMR

Table 2.3.3-39 lists the component types that require AMR and their intended functions.

Table 3.3.2-39, Aging Management Review Results – Reactor Water Cleanup System, provides the results of the AMR.

The external subcomponents (shell and channel covers) of the RWCU heat exchangers will contain fluid leakage in the event of a failure of an internal subcomponent (tubes and tubesheet). Failure of an internal subcomponent will therefore not create the potential for spatial interaction that could prevent a safety-related SSC from performing its intended function. Therefore, the RWCU heat exchanger tubes and tubesheets are not subject to AMR.

Class 1 components of the RWCU System that are part of the reactor coolant pressure boundary are evaluated in Section 2.3.1.3.

Table 2.3.3-44
Traversing Incore Probe System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Bolting	Pressure Boundary Structural Integrity
Chamber shield	Structural Integrity
Piping	Pressure Boundary Structural Integrity
Valve body	Pressure Boundary Structural Integrity

Insert pages 2.3-162a through 2.3-162f following this page

2.3.3.48 Heating Steam System

System Description

The Heating Steam (HS) System originates from four pressure reducing stations (two in the Turbine Generator Building and one each in the Reactor and Radwaste buildings). Steam at 200 psig pressure is supplied to these pressure reducing stations from either the auxiliary boiler or the gland steam evaporator. At the pressure reducing stations, the steam pressure is reduced to 50 psig and this steam is fed to the heating coils, humidifiers, steam unit heaters, and hot water heat exchanger.

Reason for Scope Determination

The HS System does not perform any safety-related system intended functions that meet the scoping criteria of 10 CFR 54.4(a)(1).

The HS System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The HS System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the HS System meets the scoping criteria of 10 CFR 54.4(a)(2).

The HS System is not relied upon to demonstrate compliance with the 10 CFR 54.4(a)(3) scoping criteria for any regulated events.

FSAR References

Section 9.4.16.2 of the FSAR describes the Heating Steam System.

License Renewal Drawings

The following license renewal drawing depicts the evaluation boundaries for the system components within the scope of license renewal:

LR-M514-1

Components assigned by equipment piece number (EPN) to the Radwaste Building Mixed Air (WMA), Radwaste Building Outside Air (WOA), and Radwaste Building Return Air (WRA) systems are included within the evaluation boundaries of the HS System for completeness (see LR-M514-1).

Components Subject to AMR

Table 2.3.3-45 lists the component types that require AMR and their intended functions.

Table 3.3.2-45, Aging Management Review Results – Heating Steam System, provides the results of the AMR.

Table 2.3.3-45
Heating Steam System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Bolting	Structural integrity
Heat exchanger (heating coil headers)	Structural integrity
Heat exchanger (heating coil tubes)	Structural integrity
Humidifier	Structural integrity
Piping	Structural integrity
Strainer (body)	Structural integrity
Trap body	Structural integrity
Tubing	Structural integrity
Valve body	Structural integrity

2.3.3.49 Heating Steam Condensate System

System Description

The condensate of the Heating Steam Condensate (HCO) System originates from the HS System and is returned to the auxiliary boiler condensate return tank located in the auxiliary boiler room of the Turbine Generator Building. Condensate from the Reactor Building, Turbine Generator Building, and upper level of the Service Building is returned to the auxiliary condensate return tank by gravity.

In the Radwaste Building and lower level of the Service Building, the condensate returns are below the level of the auxiliary condensate return tank. A condensate pump-set is, therefore, provided in each of these areas to pump the condensate to the return tank.

Reason for Scope Determination

The HCO System does not perform any safety-related system intended functions that meet the scoping criteria of 10 CFR 54.4(a)(1).

The HCO System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The HCO System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the HCO System meets the scoping criteria of 10 CFR 54.4(a)(2).

The HCO System is not relied upon to demonstrate compliance with the 10 CFR 54.4(a)(3) scoping criteria for any regulated events.

FSAR References

Section 9.4.16.2 of the FSAR describes the Heating Steam Condensate System.

License Renewal Drawings

The following license renewal drawing depicts the evaluation boundaries for the system components within the scope of license renewal:

LR-M514-1

Components Subject to AMR

Table 2.3.3-46 lists the component types that require AMR and their intended functions.

Table 3.3.2-46, Aging Management Review Results – Heating Steam Condensate System, provides the results of the AMR.

Table 2.3.3-46
Heating Steam Condensate System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Bolting	Structural integrity
Piping	Structural integrity
Pump casing	Structural integrity
Strainer (body)	Structural integrity
Tank	Structural integrity
Trap body	Structural integrity
Tubing	Structural integrity
Valve body	Structural integrity

2.3.3.50 Heating Steam Vent System

System Description

The Heating Steam Vent (HSV) System provides a vent through the roof of the respective buildings of the relief valves and tanks of the HS and HCO systems.

Reason for Scope Determination

The HSV System does not perform any safety-related system intended functions that meet the scoping criteria of 10 CFR 54.4(a)(1).

The HSV System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The HSV System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the HSV System meets the scoping criteria of 10 CFR 54.4(a)(2).

The HSV System is not relied upon to demonstrate compliance with the 10 CFR 54.4(a)(3) scoping criteria for any regulated events.

FSAR References

Figure 9.4-9.1 of the FSAR describes the Heating Steam Vent System.

License Renewal Drawings

The following license renewal drawing depicts the evaluation boundaries for the system components within the scope of license renewal:

LR-M514-1

Components Subject to AMR

Table 2.3.3-47 lists the component types that require AMR and their intended functions.

Table 3.3.2-47, Aging Management Review Results – Heating Steam Vent System, provides the results of the AMR.

Table 2.3.3-47
Heating Steam Vent System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Bolting	Structural integrity
Piping	Structural integrity

2.3.4 Steam and Power Conversion Systems

The steam and power conversion systems are those systems used as a heat sink to remove heat from the reactor and convert the heat generated in the reactor to the electrical output produced by the plant. The following Columbia systems are addressed in this section:

- Auxiliary Steam (AS) System (Section 2.3.4.1)
- Condensate (Auxiliary) (CO) System (Section 2.3.4.2)
- Condensate (Nuclear) (COND) System (Section 2.3.4.3)
- Main Steam (MS) System (Section 2.3.4.4)
- Main Steam Leakage Control (MSLC) System (Section 2.3.4.5)
- Miscellaneous Drain (MD) System (Section 2.3.4.6)
- Reactor Feedwater (RFW) System (Section 2.3.4.7)

Insert:
"Sealing Steam (SS) System
(Section 2.3.4.8)"

A brief system description, reason for scope determination, associated FSAR references, associated license renewal drawings, and components subject to AMR information is provided for each system.

Amendment 1

2.3.4.2 Condensate (Auxiliary) (CO) System

System Description

The CO System returns condensate from the Auxiliary Steam System, which operates only when the heating steam evaporators are inoperative during plant shutdown, to the Condensate Return Tank, by means of either the Radwaste Building Heating Condensate Pump Set (WHCO-CU-1) or the Condensate Pump Set (SHCO-CU-1).

Reason for Scope Determination

The CO System does not perform any safety-related system intended functions that meet the scoping criteria in 10 CFR 54.4(a)(1).

The CO System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The CO System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the CO System meets the scoping criteria of 10 CFR 54.4(a)(2).

The CO System is not relied upon to demonstrate compliance with the 10 CFR 54.4(a)(3) scoping criteria for any regulated events.

FSAR References

Section 1.2.2.12.16 of the FSAR describes the CO System.

License Renewal Drawings

The following license renewal drawings depict the evaluation boundaries for the system components within the scope of license renewal:

LR-M513, LR-M783

Insert: ", LR-M514-1"

Components Subject to AMR

Table 2.3.4-2 lists the component types that require AMR and their intended functions.

Table 3.4.2-2, Aging Management Review Results – Condensate (Auxiliary) System, provides the results of the AMR.

Table 2.3.4-2
Condensate (Auxiliary) System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Bolting	Structural integrity
Condenser	Structural integrity
Piping	Structural integrity
Pump casing	Structural integrity
Valve body	Structural integrity

Insert A from page 2.3-167a

Insert A to Table 2.3.4-2:

Tank	Structural integrity

License Renewal Drawings

The following license renewal drawings depict the evaluation boundaries for the system components within the scope of license renewal:

LR-M504-2, LR-M526-1, LR-M527-1

Insert: ", LR-M504-1, LR-M527-2, LR-M532, LR-M534"

Components Subject to AMR

Table 2.3.4-3 lists the component types that require AMR and their intended functions.

Table 3.4.2-3, Aging Management Review Results – Condensate (Nuclear) System, provides the results of the AMR.

The condenser tubes are not subject to AMR because they do not perform a license renewal intended function of the COND System.

Table 2.3.4-3
Condensate (Nuclear) System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Bolting	Pressure boundary Structural integrity
Heat exchanger (shell)	Pressure boundary
Orifice	Pressure boundary Structural integrity Throttling
Piping	Pressure boundary Structural integrity
Pump casing	Structural integrity
Tank (COND-TK-1A, COND-TK-1B)	Pressure boundary
Tubing	Pressure boundary Structural integrity
Valve body	Pressure boundary Structural integrity

Insert A from page 2.3-170a

Insert A to Table 2.3.4-3:

Flexible connection	Structural integrity

The ASME Class 1 portions of the RFW System are addressed with the reactor coolant pressure boundary in Section 2.3.1.3.

Components Subject to AMR

Table 2.3.4-7 lists the component types that require AMR and their intended functions.

Table 3.4.2-7, Aging Management Review Results – Reactor Feedwater System, provides the results of the AMR.

The small-bore lines to flow transmitters RFW-FT-802A and 802B are decoupled from the piping analysis, and are therefore not in scope.

The flow meter section is in scope only for NSAS; therefore, the internals, including the flow straighteners and the nozzles are not in scope.

Table 2.3.4-7
Reactor Feedwater System
Components Subject to Aging Management Review

Component Type	**Intended Function (as defined in Table 2.0-1)**
Bolting	Structural integrity
Flow element	Structural integrity
Piping	Structural integrity
Valve body	Structural integrity

Insert pages 2.3-180a and 2.3-180b following this page

Amendment 1

2.3.4.8 Sealing Steam System

System Description

The Sealing Steam (SS) System consists of two 100%-capacity gland seal steam evaporators, seal steam pressure regulators, seal steam header, gland seal steam condenser, exhauster blowers, and the associated piping, valves, and instrumentation. Sealing steam for turbine shaft seal glands and valve stem seal glands (stop, control, reheat stop, intercept, and bypass valves) is supplied from the seal steam header at 200 psig. The source of sealing steam is from the gland seal steam evaporators or the auxiliary steam boiler. The sealing steam is produced in an evaporator which is heated by extraction steam taken from the high pressure turbine. The condensate fed to the evaporator is taken from the suction header of the reactor feedwater pumps in the feedwater system. During startup and low load operations, a branch line taken off the main steam header supplies the necessary heating steam for the evaporator.

Separate seal steam regulators are provided to regulate the pressure of sealing steam for the high pressure turbine, each low pressure turbine, each reactor feed pump turbine shaft seal, the bypass valve assembly, and the main stop and control valve assembly stems.

Since the low pressure (LP) turbine and reactor feedwater pump turbine exhaust pressures are at a vacuum, sufficient sealing steam is supplied to maintain positive pressure in the glands to prevent air inleakage along the shaft. The high pressure (HP) turbine exhaust pressure varies with load and is approximately 177 psia at its maximum. The system is designed to maintain the seal steam supply to the HP turbine glands at a pressure of 16 to 20 psi above HP turbine exhaust to prevent HP turbine exhaust steam leakage through the shaft gland seal.

The outer leakoff of all glands is routed to the gland seal steam condenser which is maintained at a slight vacuum by the exhauster blower. During plant operation, the gland seal steam condenser and one motor-driven blower is in operation. The exhauster blower discharges gland air inleakage to the atmosphere via the reactor building elevated release duct. The gland seal steam condenser is cooled by the main condensate flow.

The steam evaporator is a shell-and-tube heat exchanger designed to provide a continuous supply of clean sealing steam to the seal steam header.

Reason for Scope Determination

The SS System does not perform any safety-related system intended functions that meet the scoping criteria of 10 CFR 54.4(a)(1).

The SS System does not contain any NSR components that perform a 10 CFR 54.4(a)(1) function. The SS System does, however, contain NSR components that are attached to or located near safety-related SSCs, whose failure creates a potential for spatial interaction that could prevent the satisfactory accomplishment of one or more of the functions identified in 10 CFR 54.4(a)(1). Therefore, the SS System meets the scoping criteria of 10 CFR 54.4(a)(2).

The SS System is not relied upon to demonstrate compliance with the 10 CFR 54.4(a)(3) scoping criteria for any regulated events.

FSAR References

Section 10.4.3.2 of the FSAR describes the Sealing Steam System.

License Renewal Drawings

The following license renewal drawing depicts the evaluation boundaries for the system components within the scope of license renewal:

LR-M502-3

Components Subject to AMR

Table 2.3.4-8 lists the component types that require AMR and their intended functions.

Table 3.4.2-8, Aging Management Review Results – Sealing Steam System, provides the results of the AMR.

Table 2.3.4-8
Sealing Steam System
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
Piping	Structural integrity

2.4.4 Circulating Water Pump House – Seismic Category II

Structure Description

The Circulating Water Pump House (aka Circulation Water Pump House) houses the electric and diesel driven fire water pumps, and three circulating water pumps. The Circulating Water Pump House has a reinforced concrete floor, insulated metal wall panels, and a metal roof deck over structural steel framing. The Circulating Water Pump House and the chlorination sections of the building are separated by a masonry wall. The diesel fire pump fuel storage tank room is isolated by ~~3-hour~~ fire rated masonry walls. Replace: "2-hour"

The portion of the structure containing chlorination systems does not contain any equipment within the scope of license renewal.

Remote buildings credited in the fire protection program (Service Water Pump House 1 and 2, Circulating Water Pump House, Water Filtration Building) with non-rated barriers are sufficiently separated from each other and from the plant that a single exposure fire would not spread to more than one building.

The circulating water basin is addressed with Yard Structures (Section 2.4.12).

Reason for Scope Determination

The Circulating Water Pump House is relied upon to demonstrate compliance with the Fire Protection (10 CFR 50.48) regulated event and meets the 10 CFR 54.4(a)(3) scoping criteria. The Circulating Water Pump House provides physical support and protection to the fire water pumps, which are relied upon to demonstrate compliance with Fire Protection regulated event.

In addition, the Circulating Water Pump House is in the scope of license renewal because it contains:

- Structural components that are relied on during postulated fire event.

FSAR References

Section 10.4.5.2 and Appendix F of the FSAR describe the Circulating Water Pump House.

Components Subject to AMR

Table 2.4-4 lists the component types that require AMR and their intended functions.

The structural commodities for the Circulating Water Pump House are addressed in the bulk commodities evaluation in Section 2.4.13.

- Structural components that are safety-related and are relied upon to remain functional during and following design basis events.
- Structural components that are NSR whose failure could prevent satisfactory accomplishment of safety-related functions.
- Structural components that are relied on during postulated fires, anticipated transients without scram, and station blackout events.

FSAR References

Section 3.8.4 of the FSAR describes the Diesel Generator Building.

Components Subject to AMR

Table 2.4-5 lists the component types that require AMR and their intended functions.

The structural commodities for the Diesel Generator Building are addressed in the bulk commodities evaluation in Section 2.4.13.

Table 3.5.2-5, Aging Management Review Results - Diesel Generator Building, provides the results of the AMR.

Table 2.4-5
Diesel Generator Building
Components Subject to Aging Management Review

Component Type	**Intended Function (as defined in Table 2.0-1)**
Battery Racks	SSR
Diesel Generator Exhaust Plenums	EN, MB, SRE, SSR
Diesel Generator Intake Plenums	EN, MB, SRE, SSR
Diesel Generator Pedestals	EXP, EN, SSR
Exterior Walls (above grade)	EN, MB, SRE, SSR
Foundations	EN, EXP, SRE, SSR
Reinforced Concrete: Walls, Floors, and Ceilings	EN, FB, MB, SRE, SSR
Roof	EN, MB, SRE, SSR
Structural Steel: Beams, Columns, Plates, and Trusses (includes welds and bolted connections)	EN, SSR

Add new table row from Insert A shown on page 2.4-24a

Amendment 1

Insert A to page 2.4-24

Table 2.4-5
Diesel Generator Building
Components Subject to Aging Management Review

Component Type	Intended Function (as defined in Table 2.0-1)
South Exterior Slab	SRE

2.5.3 Elimination of Component Commodity Groups with no License Renewal Intended Functions

No generic electrical and I&C component commodity groups were eliminated from AMR at Columbia, in accordance with the direction of 10 CFR 54.21(a)(1)(i) regarding license renewal intended functions. However, individual components within a component and commodity group may still be eliminated from AMR based on this ~~criteria~~.

Replace: "criterion"

2.5.4 Application of Screening Criteria 10 CFR 54.21(a)(1)(ii) to Electrical and I&C Component Commodity Groups

The next step in the electrical screening process is to segregate the "long-lived" electrical components from those that are subject to replacement based on a qualified life or a specified time schedule. In general, components that are screened out of license renewal consideration based on the "long-lived" criterion are those included in the plant environmental qualification (EQ) program. Electrical components included in the plant EQ program have qualified lives and are replaced based on their qualified life determination. Therefore, environmentally qualified components do not meet the "long-lived" criterion of 10 CFR 54.21(a)(1)(ii) and are excluded from further evaluation. EQ evaluations that meet the criteria for a time-limited aging analysis are addressed in Section 4.4.

2.5.4.1 Electrical Portions of Electrical and I&C Penetration Assemblies

The electrical penetration assembly commodity group is excluded from AMR because all of the Columbia electrical penetrations are part of the EQ program. The electrical penetration assemblies are addressed by various EQ analyses. Therefore, the electrical penetration assemblies are not subject to AMR at Columbia, because they do not meet the long-lived criterion of 10 CFR 54.21(a)(1)(ii).

2.5.4.2 Insulated Cables and Connections in the EQ Program

The insulated cables and connections that are included in the plant EQ program have qualified lives and are replaced based on their qualified life determination. Therefore, insulated cables and connections that are included in the EQ program do not meet the "long-lived" criterion of 10 CFR 54.21(a)(1)(ii) and are not subject to AMR.

2.5.5 Electrical and I&C Component Commodity Groups Requiring an Aging Management Review

The electrical and I&C component commodity groups that require AMR are listed in Table 2.5-1, along with their intended functions. Intended functions are defined in Table 2.0-1.

Table 3.6.2-1, Aging Management Review Results - Electrical and I&C Components, provides the results of the AMR.

Amendment 1

The function of high-voltage insulators is to insulate and support an electrical conductor. High voltage insulators are passive, long-lived components. Therefore, high voltage insulators meet the criteria of 10 CFR 54.21(a)(1) and are subject to an AMR.

2.5.6 Evaluation Boundaries

2.5.6.1 System Evaluation Boundaries

The evaluation boundaries for the electrical and I&C systems within the scope of license renewal include the entire system. Electrical and I&C component types within the boundaries of in-scope mechanical systems are also included within the electrical and I&C evaluation boundaries.

2.5.6.2 Station Blackout Evaluation Boundaries

The License Renewal Rule, 10 CFR 54.4(a)(3), requires that plant SSCs relied on for compliance with the NRC regulation on station blackout (SBO), 10 CFR 50.63, be included in the scope of license renewal. In April 2002, the NRC issued additional guidance on the (license renewal) scoping of equipment relied on to meet the requirements of 10 CFR 50.63 in the form of an Interim Staff Guidance document (ISG-02). Subsequently, this guidance was incorporated into NUREG-1801, Revision 1.

Insert: ", which is now an historical reference"

Using the requirements of the License Renewal Rule, the guidance provided in NUREG-1800, the insights of ISG-02, and the current licensing basis documentation, the SBO license renewal scoping boundary was established and the in-scope SSCs for SBO were identified. The following paragraphs describe the SBO license renewal off-site power recovery paths for Columbia.

Two independent offsite power sources are supplied to Columbia via start-up transformer E-TR-S and back-up transformer E-TR-B.

The 230-kV grid is connected to the onsite power system by breaker E-CB-TRS (also known as A809) at the Ashe substation then via overhead line to transformer E-TR-S located in the Columbia transformer yard. The distribution from the start-up transformer (E-TR-S) to the Class 1E buses is through the non-segregated bus to switchgear SM-1 and SM-3. Each of these NSR switchgear feed to the Class 1E switchgear for Division 1 and Division 2 (SM-7 and SM-8, respectively).

The 115-kV grid is connected to the onsite power source by oil circuit breaker E-CB-TRB located in the Columbia transformer yard. The output of breaker E-CB-TRB is directly tied by switchyard bus to back-up transformer E-TR-B, which is then directly connected by cable (routed underground and then in tray) to the Class 1E switchgear for Division 1 and Division 2 (SM-7 and SM-8 respectively).

- Fire Protection System (Section 2.3.3.22)
- Floor Drain System (Section 2.3.3.23)
- Floor Drain Radioactive System (Section 2.3.3.24)
- Fuel Pool Cooling System (Section 2.3.3.25)
- Miscellaneous Waste Radioactive System (Section 2.3.3.27)
- Plant Sanitary Drains System (Section 2.3.3.28)
- Plant Service Water System (Section 2.3.3.29)
- Potable Cold Water System (Section 2.3.3.30)
- Potable Hot Water System (Section 2.3.3.31)
- Primary Containment System (Section 2.3.3.32)
- Process Sampling System (Section 2.3.3.33)
- Process Sampling Radioactive System (Section 2.3.3.34)
- Pump House HVAC Systems (Section 2.3.3.35)
- Radwaste Building Chilled Water System (Section 2.3.3.36)
- Radwaste Building HVAC Systems (Section 2.3.3.37)
- Reactor Building HVAC Systems (Section 2.3.3.38)
- Reactor Closed Cooling Water System (Section 2.3.3.39)
- Reactor Water Cleanup System (Section 2.3.3.41)
- Service Air System (Section 2.3.3.42)
- Standby Liquid Control System (Section 2.3.3.43)
- Standby Service Water System (Section 2.3.3.44)
- Tower Makeup Water System (Section 2.3.3.46)
- Traversing Incore Probe System (Section 2.3.3.47)

Add Insert A from page 3.3-2a

Table 3.3.1, Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of NUREG-1801, provides the summary of the programs evaluated in NUREG-1801 that are applicable to component and commodity groups in this section. Text addressing summary items requiring further evaluation is provided in Section 3.3.2.2.

Insert A to LRA Section 3.3.1

- Heating Steam System (Section 2.3.3.48)
- Heating Steam Condensate System (Section 2.3.3.49)
- Heating Steam Vent System (Section 2.3.3.50)

Table 3.3.2-39 Aging Management Review Results – Reactor Water Cleanup System

Table 3.3.2-40 Aging Management Review Results – Service Air System

Table 3.3.2-41 Aging Management Review Results – Standby Liquid Control System

Table 3.3.2-42 Aging Management Review Results – Standby Service Water System

Table 3.3.2-43 Aging Management Review Results – Tower Makeup Water System

Table 3.3.2-44 Aging Management Review Results – Traversing Incore Probe System

Add Insert A from page 3.3-5a

3.3.2.1 Materials, Environments, Aging Effects Requiring Management, and Aging Management Programs

The materials from which specific components and commodities are fabricated, the environments to which they are exposed, the aging effects requiring management, and the aging management programs used to manage these aging effects are provided for each of the above systems in the following sections.

3.3.2.1.1 Circulating Water System

Materials

The materials of construction for subject mechanical components of the Circulating Water System are:

- Concrete
- Gray cast iron
- Stainless steel
- Steel

Environments

Subject mechanical components of the Circulating Water System are exposed to the following normal operating environments:

- Air-outdoor
- Raw water
- Soil

Insert A to LRA Section 3.3.2

Table 3.3.2-45	Aging Management Review Results – Heating Steam System
Table 3.3.2-46	Aging Management Review Results – Heating Steam Condensate System
Table 3.3.2-47	Aging Management Review Results – Heating Steam Vent System

Aging Effects Requiring Management

The following aging effects require management for the subject mechanical components of the Circulating Water System:

- Loss of material
- Loss of pre-load

Add: "Cracking"

Aging Management Programs

The following aging management programs manage the aging effects for subject mechanical components of the Circulating Water System:

- Bolting Integrity Program
- Buried Piping and Tanks Inspection Program
- External Surfaces Monitoring Program
- Open-Cycle Cooling Water Program
- Selective Leaching Inspection

3.3.2.1.2 Condensate Processing Radioactive (Demineralizer) System

Materials

The material of construction for subject mechanical components of the Condensate Processing Radioactive (Demineralizer) System is:

- Steel

Environments

Subject mechanical components of the Condensate Processing Radioactive (Demineralizer) System are exposed to the following normal operating environments:

- Air-indoor uncontrolled
- Treated water

Aging Effects Requiring Management

The following aging effects require management for the subject mechanical components of the Condensate Processing Radioactive (Demineralizer) System:

- Loss of material
- Loss of pre-load

- Loss of pre-load
- Reduction of heat transfer

Aging Management Programs

The following aging management programs manage the aging effects for subject mechanical components of the Diesel Lubricating Oil System:

- Bolting Integrity Program
- Chemistry Program Effectiveness Inspection
- Closed Cooling Water Chemistry Program
- External Surfaces Monitoring Program
- Heat Exchangers Inspection
- Lubricating Oil Analysis Program
- Lubricating Oil Inspection

3.3.2.1.21 Equipment Drains Radioactive System

Materials

The materials of construction for subject mechanical components of the Equipment Drains Radioactive System are:

- Glass
- Stainless steel
- Steel

Environments

Subject mechanical components of the Equipment Drains Radioactive System are exposed to the following normal operating environments:

- Air-indoor uncontrolled
- Closed cycle cooling water
- Concrete
- Raw water
- Treated water

Add "Moist Air" as a new bullet in the list of environment

3.3.2.1.24 Floor Drain Radioactive System

Materials

The materials of construction for subject mechanical components of the Floor Drain Radioactive System are:

- Stainless steel
- Steel

Environments

Subject mechanical components of the Floor Drain Radioactive System are exposed to the following normal operating environments:

- Air-indoor uncontrolled
- Concrete
- Raw water
- Treated water

Add "Moist air" as new bullet in the list of environments

Aging Effects Requiring Management

The following aging effects require management for the subject mechanical components of the Floor Drain Radioactive System:

- Loss of material
- Loss of pre-load

Aging Management Programs

The following aging management programs manage the aging effects for subject mechanical components of the Floor Drain Radioactive System:

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- External Surfaces Monitoring Program
- Monitoring and Collection Systems Inspection
- Supplemental Piping/Tank Inspection

Amendment 1

Environments

Subject mechanical components of the Potable Cold Water System are exposed to the following normal operating environments:

- Condensation
- Raw water

Aging Effects Requiring Management

The following aging effects require management for the subject mechanical components of the Potable Cold Water System:

- ~~Cracking~~
- Loss of material

Aging Management Programs

The following aging management programs manage the aging effects for subject mechanical components of the Potable Cold Water System:

- External Surfaces Monitoring Program
- Potable Water Monitoring Program
- Selective Leaching Inspection

3.3.2.1.30 Potable Hot Water System

Materials

The materials of construction for subject mechanical components of the Potable Hot Water System are:

- Copper alloy
- Copper alloy > 15% Zn

Environments

Subject mechanical components of the Potable Hot Water System are exposed to the following normal operating environments:

- Air-indoor uncontrolled
- Raw water

3.3.2.1.32 Process Sampling System

Materials

The materials of construction for subject mechanical components of the Process Sampling System are:

- Copper alloy
- Copper alloy > 15% Zn
- Polymer
- Stainless steel
- Steel

Environments

Subject mechanical components of the Process Sampling System are exposed to the following normal operating environments:

- Condensation
- Raw water

Aging Effects Requiring Management

The following aging effects require management for the subject mechanical components of the Process Sampling System:

- Cracking
- Loss of material
- Loss of pre-load

Aging Management Programs

The following aging management programs manage the aging effects for subject mechanical components of the Process Sampling System:

- Bolting Integrity Program
- External Surfaces Monitoring Program
- Open-Cycle Cooling Water Program
- Selective Leaching Inspection

Add:
"Monitoring and Collection Systems Inspection"

Amendment 1

- External Surfaces Monitoring Program

Add new sections 3.3.2.1.45 through 47 as shown on pages 3.3-50a through d

3.3.2.2 Further Evaluation of Aging Management as Recommended by NUREG-1801

For the Auxiliary Systems, those items requiring further evaluation are addressed in the following sections.

3.3.2.2.1 Cumulative Fatigue Damage

Fatigue is a time-limited aging analysis, as defined in 10 CFR 54.3. Time-limited aging analyses are required to be evaluated in accordance with 10 CFR 54.21(c). Time-limited aging analyses identified for fatigue in the Auxiliary Systems are evaluated in Section 4.3.4.

3.3.2.2.2 Reduction of Heat Transfer due to Fouling

As described in Table 3.3.1, the Fuel Pool Cooling System has stainless steel heat exchanger tubes in treated water which are evaluated under item number 3.3.1-03. Fouling of stainless steel heat exchanger tubes in treated water is managed by the BWR Water Chemistry Program, in conjunction with the Heat Exchangers Inspection.

3.3.2.2.3 Cracking due to Stress Corrosion Cracking (SCC)

3.3.2.2.3.1 BWR Standby Liquid Control System

The treated water environment for the Standby Liquid Control System uses an aqueous solution of sodium pentaborate decahydrate. The system is normally in standby with the fluid temperature maintained above the 60°F saturation temperature in an area where the ambient temperature is less than 100°F during normal plant operation. Since the temperature is below 140°F during normal plant operation, cracking due to SCC is not an aging effect requiring management for the stainless steel components of the Standby Liquid Control System.

3.3.2.2.3.2 Heat Exchanger Components

As described in Table 3.3.1, there are no components compared to item number 3.3.1-05. The Reactor Water Cleanup regenerative and non-regenerative heat exchangers at Columbia have no stainless steel components subject to AMR. Therefore, cracking of these components due to stress corrosion cracking is not an aging effect requiring management. Refer to item 3.3.1-48 (no further evaluation required) for the aging effects that do require management for these components.

3.3.2.2.3.3 Diesel Engine Exhaust Piping, Piping Components, and Piping Elements

During normal plant operations, diesel exhaust piping, piping components, and piping elements are exposed to diesel exhaust infrequently and for short durations. For the remaining time, these components are exposed internally to outdoor air. As such, temperatures above 140°F occur only infrequently and for short durations. Therefore, cracking due to SCC is not identified as an aging effect requiring management for

3.3.2.1.45 Heating Steam System

Materials

The materials of construction for subject mechanical components of the Heating Steam System are:

- Copper alloy
- Gray cast iron
- Stainless steel
- Steel

Environments

Subject mechanical components of the Heating Steam System are exposed to the following normal operating environments:

- Air-indoor uncontrolled
- Steam

Aging Effects Requiring Management

The following aging effects require management for the subject mechanical components of the Heating Steam System:

- Cracking
- Loss of material
- Loss of pre-load

Aging Management Programs

The following aging management programs manage the aging effects for subject mechanical components of the Heating Steam System:

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- External Surfaces Monitoring Program

- Flow-Accelerated Corrosion (FAC) Program
- Selective Leaching Inspection

3.3.2.1.46 Heating Steam Condensate System

Materials

The materials of construction for subject mechanical components of the Heating Steam Condensate System are:

- Copper alloy
- Gray cast iron
- Steel

Environments

Subject mechanical components of the Heating Steam Condensate System are exposed to the following normal operating environments:

- Air-indoor uncontrolled
- Moist Air
- Steam
- Treated water > 60 °C (140 °F)

Aging Effects Requiring Management

The following aging effects require management for the subject mechanical components of the Heating Steam Condensate System:

- Loss of material
- Loss of pre-load

Aging Management Programs

The following aging management programs manage the aging effects for subject mechanical components of the Heating Steam Condensate System:

- Bolting Integrity Program

- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- External Surfaces Monitoring Program
- Flow-Accelerated Corrosion (FAC) Program
- Selective Leaching Inspection
- Supplemental Piping/Tanks Inspection

3.3.2.1.47 Heating Steam Vent System

Materials

The materials of construction for subject mechanical components of the Heating Steam Vent System are:

- Steel

Environments

Subject mechanical components of the Heating Steam Vent System are exposed to the following normal operating environments:

- Air-indoor uncontrolled
- Steam

Aging Effects Requiring Management

The following aging effects require management for the subject mechanical components of the Heating Steam Vent System:

- Loss of material
- Loss of pre-load

Aging Management Programs

The following aging management programs manage the aging effects for subject mechanical components of the Heating Steam Vent System:

- Bolting Integrity Program
- BWR Water Chemistry Program

- Chemistry Program Effectiveness Inspection
- External Surfaces Monitoring Program
- Flow-Accelerated Corrosion (FAC) Program

an aggressive environment. Therefore, loss of material due to pitting and crevice corrosion is not an aging effect requiring management for these components.

3.3.2.2.10.7 Stainless Steel Piping, Piping Components, and Piping Elements - Soil

~~As described in Table 3.3.1, there are no components compared to item number 3.3.1-29. There is no stainless steel piping subject to AMR for Columbia that is exposed to soil in the Auxiliary systems.~~ Replace with Insert A on page 3.3-55a

3.3.2.2.10.8 BWR Standby Liquid Control System

Loss of material due to pitting and crevice corrosion for stainless steel piping components and tanks exposed to sodium pentaborate solution is managed by the BWR Water Chemistry Program. The BWR Water Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a verification of the effectiveness of the BWR Water Chemistry Program to manage loss of material due to pitting and crevice corrosion through examination of stainless steel piping components and tanks exposed to sodium pentaborate solution.

Replace with Insert B from page 3.3-55a

3.3.2.2.11 Loss of Material due to Pitting, Crevice, and Galvanic Corrosion

~~As described in Table 3.3.1, there were no components compared to item number 3.3.1-31. There are no copper alloy piping, piping components, or piping elements in the Auxiliary systems that are exposed to treated water.~~

3.3.2.2.12 Loss of Material due to Pitting, Crevice, and Microbiologically Influenced Corrosion

3.3.2.2.12.1 Piping, Piping Components, and Piping Elements – Fuel Oil

There are no aluminum piping components exposed to fuel oil that are subject to AMR.

Loss of material due to pitting and crevice corrosion and MIC for stainless steel and copper alloy piping components exposed to fuel oil is managed by the Fuel Oil Chemistry Program. The Fuel Oil Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a verification of the effectiveness of the Fuel Oil Chemistry Program to manage loss of material through examination of piping and components exposed to fuel oil.

3.3.2.2.12.2 Piping, Piping Components, and Piping Elements – Lubricating Oil

Loss of material due to pitting and crevice corrosion and MIC for stainless steel piping components and heat exchanger components exposed to lubricating oil is managed by the Lubricating Oil Analysis Program. The Lubricating Oil Analysis Program manages aging effects through periodic monitoring and control of contaminants, including water. The Lubricating Oil Inspection will provide a verification of the effectiveness of the

Insert A to LRA Section 3.3.2.2.10.7

The Buried Piping Thanks Inspection Program, with enhancement, manages loss of material due to pitting and crevice corrosion and microbiologically influenced corrosion (MIC) for stainless steel piping and piping components buried in soil.

Insert B to LRA Section 3.3.2.2.11

Loss of material due to pitting, crevice, and galvanic corrosion for copper alloy piping, piping components, or piping elements exposed to treated water is managed by the BWR Water Chemistry Program. The BWR Water Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a verification of the effectiveness of the BWR Water Chemistry Program to manage loss of material due to pitting, crevice, and galvanic corrosion through examination of copper alloy piping and piping components exposed to treated water.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of NUREG-1801

Item Number	Component/Commodity	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-28	Copper alloy fire protection piping, piping components, and piping elements exposed to condensation (internal)	Loss of material due to pitting and crevice corrosion	A plant-specific aging management program is to be evaluated.	Yes, plant specific	Not applicable. There are no copper alloy fire protection piping, piping components, or piping elements in the auxiliary systems that are exposed to condensation (internal). Refer to Section 3.3.2.2.10.6 for further information.
3.3.1-29	Stainless steel piping, piping components, and piping elements exposed to soil	Loss of material due to pitting and crevice corrosion	A plant-specific aging management program is to be evaluated.	Yes, plant specific	~~Not applicable~~. ~~There are no stainless steel piping, piping components, or piping elements in the auxiliary systems that are exposed to soil~~. Refer to Section 3.3.2.2.10.7 for further information.

Replace with Insert A on page 3.3-75a

Amendment 1

Insert A to LRA Table 3.3.1 Item 3.3.1-29

The Buried Piping and Tanks Inspection Program, with enhancement, is credited to manage loss of material for stainless steel piping, piping components and piping elements (with or without coating or wrapping) in the auxiliary systems that are exposed to soil.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of NUREG-1801

Item Number	Component/Commodity	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-31	Copper alloy piping, piping components, and piping elements exposed to treated water	Loss of material due to pitting, crevice, and galvanic corrosion	Water Chemistry and One-Time Inspection Replace discussion with Insert A from page 3.3-77a	Yes, detection of aging effects is to be evaluated	~~Not applicable~~. ~~There are no copper alloy piping, piping components, or piping elements in the auxiliary systems that are exposed to treated water.~~ ~~Refer to Section 3.3.2.2.11 for further information~~.
3.3.1-32	Stainless steel, aluminum and copper alloy piping, piping components, and piping elements exposed to fuel oil	Loss of material due to pitting, crevice, and microbiologically influenced corrosion	Fuel Oil Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801, with exceptions. The Fuel Oil Chemistry Program, in conjunction with the Chemistry Program Effectiveness Inspection, is credited to manage loss of material for stainless steel and copper alloy piping and piping components in the auxiliary systems that are exposed to fuel oil. There are no aluminum piping, piping components, or piping elements in the auxiliary systems that are exposed to fuel oil. Refer to Section 3.3.2.2.12.1 for further information.

Insert A to LRA Table 3.3.1 Item 3.3.1-31

Consistent with NUREG-1801.

The BWR Water Chemistry Program, in conjunction with the Chemistry Program Effectiveness Inspection, is credited to manage loss of material for copper alloy piping and piping components in the auxiliary systems that are exposed to treated water.

Refer to Section 3.3.2.2.11 for further information.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of NUREG-1801

Item Number	Component/Commodity	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-71	Steel piping, piping components, and piping elements exposed to moist air or condensation (Internal)	Loss of material due to general, pitting, and crevice corrosion	Inspection of Internal *Surfaces in* Miscellaneous Piping and Ducting Components Replace deleted text with Insert A from page 33-101a	No	The following programs are *credited to manage loss of* material for steel piping, piping components, and tanks in the auxiliary systems that are exposed to moist air or condensation (internal): • Cooling Units Inspection for drain piping in HVAC systems exposed to condensation (internal) • Monitoring and Collection Systems Inspection for air-water interfaces in Plant Sanitary Drain System piping evaluated as exposed to moist air (internal) • ~~Supplemental Piping/Tank Inspection for air-water interfaces in piping and tanks evaluated as exposed to moist air (internal)~~ A Note E is applied in each case.

Insert A to LRA Table 3.3.1 Item 3.3.1-71

- Supplemental Piping/Tank Inspection *for air-water interfaces in piping, piping components, and tanks evaluated as exposed to moist air (internal)*

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of NUREG-1801

Item Number	Component/Commodity	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-76	Steel piping, piping components, and piping elements (without lining/coating or with degraded lining/coating) exposed to raw water	Loss of material due to general, pitting, crevice, and microbiologically influenced corrosion, fouling, and lining/coating degradation	Open-Cycle Cooling Water System Replace deleted text with: "drain piping and tanks"	No	Consistent with NUREG-1801, with exceptions. Except as noted below, the Open-Cycle Cooling Water Program is credited to manage loss of material for steel piping, piping components, and piping elements that are exposed to raw water. For steel piping and piping components in the other auxiliary systems that are exposed to raw water, the following programs are credited to manage loss of material: • Diesel Starting Air Inspection for drain piping in Diesel Starting Air System • Diesel Systems Inspection for drain piping in the Diesel (Engine) Exhaust System • Monitoring and Collection Systems Inspection for ~~drain piping~~ in Equipment Drains Radioactive, Floor Drain, and Floor Drain Radioactive systems

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of NUREG-1801

Item Number	Component/Commodity	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-85	Gray cast iron piping, piping components, and piping elements exposed to soil, raw water, treated water or closed-cycle cooling water	Loss of material due to selective leaching	Selective Leaching of Materials	No	Consistent with NUREG-1801. The Selective Leaching Inspection is credited to detect and characterize loss of material due to selective leaching for gray cast iron piping, piping components, and piping elements in the auxiliary systems exposed to soil, raw water, and closed-cycle cooling water. This item is also applied to gray cast iron heat exchanger components that are exposed to raw water and closed cycle cooling water, and to gray cast iron tank components exposed to raw water. A Note C is applied.
3.3.1-86	Structural steel (new fuel storage rack assembly) exposed to air – indoor uncontrolled (external)	Loss of material due to general, pitting, and crevice corrosion	Structures Monitoring Program	No	Not applicable. There is no structural steel (new fuel storage rack assembly) exposed to air-indoor uncontrolled (external).
3.3.1-87	PWR Only				
3.3.1-88	PWR Only				
3.3.1-89	PWR Only				

Insert: "treated water"

Amendment 1

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of NUREG-1801

Item Number	Component/Commodity	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-94	Stainless steel and nickel alloy piping, piping components, and piping elements exposed to air – indoor uncontrolled (external)	None	None Insert: "heat exchanger components,"	NA - No AEM or AMP	Consistent with NUREG-1801. No aging effects requiring management are identified for stainless steel piping, piping components, and piping elements in the auxiliary systems that are exposed to air-indoor uncontrolled (external). This item is also applied to stainless steel accumulators, bolting, drain pans, duct, screens, and tanks that are exposed to air-indoor uncontrolled (external). A Note C is applied.
3.3.1-95	Steel and aluminum piping, piping components, and piping elements exposed to air – indoor controlled (external)	None	None	NA - No AEM or AMP	Not applicable. There are no steel or aluminum piping, piping components, or piping elements in the auxiliary systems that are exposed to air-indoor controlled (external). All air-indoor environments were conservatively evaluated as uncontrolled environments.

Table 3.3.2-1 Aging Management Review Results – Circulating Water System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
1	Bolting	Pressure boundary	Steel	Air-outdoor (External)	Loss of material	Bolting Integrity	VII.I-1	3.3.1-43	B
2	Bolting	Pressure boundary	Steel	Air-outdoor (External)	Loss of pre-load	Bolting Integrity	N/A	N/A	H
3	Piping	Pressure boundary	Concrete	Raw water (Internal)	None	None	N/A	N/A	G
4	Piping	Pressure boundary	Concrete	Soil (External)	None	None	II.B1.2-1	3.5.1-2	I 0301
5	Piping	Pressure boundary	Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-19	3.3.1-76	B
6	Piping	Pressure boundary	Steel	Air-outdoor (External)	Loss of material	External Surfaces Monitoring	VII.I-9	3.3.1-58	A
7	Piping	Pressure boundary	Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	VII.C1-18	3.3.1-19	A
~~8~~	~~Rupture Disc~~	~~Pressure boundary~~	~~Stainless Steel~~	~~Raw water (Internal)~~	~~Loss of material~~	~~Open-Cycle Cooling Water~~	~~VII.C1-15~~	~~3.3.1-79~~	~~B~~
~~9~~	~~Rupture Disc~~	~~Pressure boundary~~	~~Stainless Steel~~	~~Raw water (External)~~	~~Loss of material~~	~~Open-Cycle Cooling Water~~	~~VII.C1-15~~	~~3.3.1-79~~	~~B~~

Delete rows 8 and 9

Amendment 1

Table 3.3.2-1 Aging Management Review Results – Circulating Water System									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
10	Valve Body	Pressure boundary	Gray Cast Iron	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-19	3.3.1-76	B
11	Valve Body	Pressure boundary	Gray Cast Iron	Raw water (Internal)	Loss of material	Selective Leaching Inspection	VII.C1-11	3.3.1-85	A
12	Valve Body	Pressure boundary	Gray Cast Iron	Air-outdoor (External)	Loss of material	External Surfaces Monitoring	VII.I-9	3.3.1-58	A
13	Valve Body	Pressure boundary	Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-19	3.3.1-76	B
14	Valve Body	Pressure boundary	Steel	Air-outdoor (External)	Loss of material	External Surfaces Monitoring	VII.I-9	3.3.1-58	A

Insert new rows 15 through 21 for Table 3.3.2-1 as shown on page 3.3-119a

Amendment 1

Table 3.3.2-1 Aging Management Review Results – Circulating Water System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
15	Bolting	Pressure boundary	Steel	Soil (External)	Cracking	Buried Piping and Tanks Inspection	N/A	N/A	G
16	Bolting	Pressure boundary	Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	N/A	N/A	G
17	Bolting	Pressure boundary	Steel	Soil (External)	Loss of pre-load	Buried Piping and Tanks Inspection	N/A	N/A	G
18	Bolting	Pressure boundary	Stainless Steel	Soil (External)	Cracking	Buried Piping and Tanks Inspection	N/A	N/A	F
19	Bolting	Pressure boundary	Stainless Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	N/A	N/A	F
20	Bolting	Pressure boundary	Stainless Steel	Soil (External)	Loss of pre-load	Buried Piping and Tanks Inspection	N/A	N/A	F
21	Valve body	Pressure boundary	Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	VII.C1-18	3.3.1-19	A

Table 3.3.2-14 Aging Management Review Results – Diesel Building HVAC Systems

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
18	Fan Housing (DEA-FN-11, 12, 21, 22, 31, 32 & 52)	Pressure boundary	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	C 0302
19	Fan Housing (DEA-FN-11, 12, 21, 22, 31, 32 & 52)	Pressure boundary	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
20	Flexible Connection	Pressure boundary	Elastomer	Air-indoor uncontrolled (Internal)	Hardening and loss of strength	External Surfaces Monitoring	VII.F4-6	3.3.1-11	E
21	Flexible Connection	Pressure boundary	Elastomer	Air-indoor uncontrolled (External)	Hardening and loss of strength	External Surfaces Monitoring	VII.F4-6	3.3.1-11	E
22	Heat Exchanger (header) (DMA-CC-11, 12, 21, 22, 31 & 32)	Pressure boundary	Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-5	3.3.1-77	B
23	Heat Exchanger (header) (DMA-CC-11, 12, 21, 22, 31 & 32)	Pressure boundary	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.I-11	3.3.1-58	A
~~24~~	~~Heat Exchanger (fins) (DMA-CC-11, 12, 21, 22, 31 & 32)~~	~~Heat transfer~~	~~Aluminum~~	~~Condensation (External)~~	~~Cracking~~	~~Open-Cycle Cooling Water~~	~~N/A~~	~~N/A~~	~~H~~

Delete row 24

Amendment 1

Table 3.3.2-14 Aging Management Review Results – Diesel Building HVAC Systems

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
25	Heat Exchanger (fins) (DMA-CC-11, 12, 21, 22, 31 & 32)	Heat transfer	Aluminum	Condensation (External)	Loss of material	Open-Cycle Cooling Water	VII.F2-12	3.3.1-27	E Add: 0325
26	Heat Exchanger (fins) (DMA-CC-11, 12, 21, 22, 31 & 32)	Heat transfer	Aluminum	Condensation (External)	Reduction in heat transfer	Open-Cycle Cooling Water	N/A	N/A	H
27	Heat Exchanger (tubes) (DMA-CC-11, 12, 21, 22, 31 & 32)	Heat transfer	Copper Alloy	Raw water (Internal)	Reduction in heat transfer	Open-Cycle Cooling Water	VII.C1-6	3.3.1-83	B
28	Heat Exchanger (tubes) (DMA-CC-11, 12, 21, 22, 31 & 32)	Heat transfer	Copper Alloy	Condensation (External)	Reduction in heat transfer	Open-Cycle Cooling Water	N/A	N/A	H
29	Heat Exchanger (tubes) (DMA-CC-11, 12, 21, 22, 31 & 32)	Pressure boundary	Copper Alloy	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-3	3.3.1-82	B
30	Heat Exchanger (tubes) (DMA-CC-11, 12, 21, 22, 31 & 32)	Pressure boundary	Copper Alloy	Condensation (External)	Loss of material	Open-Cycle Cooling Water	VII.F2-14	3.3.1-25	E

Table 3.3.2-18 Aging Management Review Results – Diesel Fuel Oil System									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
73	Tubing	Pressure boundary	Stainless Steel	Fuel oil (Internal)	Loss of material	Fuel Oil Chemistry	VII.H1-6	3.3.1-32	B
74	Tubing	Pressure boundary	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A
75	Valve Body	Pressure boundary	Steel	Fuel oil (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VII.H1-10	3.3.1-20	A
76	Valve Body	Pressure boundary	Steel	Fuel oil (Internal)	Loss of material	Fuel Oil Chemistry	VII.H1-10	3.3.1-20	B
77	Valve Body	Pressure boundary	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
78	Valve Body	Structural integrity	Steel	Fuel oil (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VII.H1-10	3.3.1-20	A
79	Valve Body	Structural integrity	Steel	Fuel oil (Internal)	Loss of material	Fuel Oil Chemistry	VII.H1-10	3.3.1-20	B
80	Valve Body	Structural integrity	Steel	Air-outdoor (External)	Loss of material	External Surfaces Monitoring	VII.I-9	3.3.1-58	A

Insert new rows 81 through 86 for Table 3.3.2-18 as shown on page 3.3-215a

Amendment 1

Table 3.3.2-18 Aging Management Review Results – Diesel Fuel Oil System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
81	Bolting	Pressure boundary	Steel	Soil (External)	Cracking	Buried Piping and Tanks Inspection	N/A	N/A	G
82	Bolting	Pressure boundary	Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	N/A	N/A	G
83	Bolting	Pressure boundary	Steel	Soil (External)	Loss of pre-load	Buried Piping and Tanks Inspection	N/A	N/A	G
84	Bolting	Structural integrity	Steel	Soil (External)	Cracking	Buried Piping and Tanks Inspection	N/A	N/A	G
85	Bolting	Structural integrity	Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	N/A	N/A	G
86	Bolting	Structural integrity	Steel	Soil (External)	Loss of pre-load	Buried Piping and Tanks Inspection	N/A	N/A	G

Table 3.3.2-21 Aging Management Review Results – Equipment Drains Radioactive System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
52	Valve Body	Structural integrity	Steel	Treated water (Internal)	Loss of material	Monitoring and Collection Systems Inspection	VII.E3-18	3.3.1-17	E
53	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A

Insert new rows 54 through 60 for Table 3.3.2-21 after this page

Amendment 1

Table 3.3.2-21 Aging Management Review Results – Equipment Drains Radioactive System									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
54	Pump Casing (EDR-P14A, 14B, 15)	Structural integrity	Stainless Steel	Air-indoor uncontrolled (Internal)	None	None	VII.J-15	3.3.1-94	A 0306
55	Pump Casing (EDR-P14A, 14B, 15)	Structural integrity	Stainless Steel	Raw water (Internal)	Loss of material	Monitoring and Collection Systems Inspection	VII.C1-15	3.3.1-79	E
56	Pump Casing (EDR-P14A, 14B, 15)	Structural integrity	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A
57	Tank (EDR-TK-4A, 4B, 5)	Structural integrity	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	C 0302
58	Tank (EDR-TK-4A, 4B, 5)	Structural integrity	Steel	Moist air (Internal)	Loss of material	Supplemental Piping/Tank Inspection	VII.H2-21	3.3.1-71	E 0303
59	Tank (EDR-TK-4A, 4B, 5)	Structural integrity	Steel	Raw water (Internal)	Loss of material	Monitoring and Collection Systems Inspection	VII.C1-19	3.3.1-76	E
60	Tank (EDR-TK-4A, 4B, 5)	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A

Table 3.3.2-22 Aging Management Review Results –Fire Protection System									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
113	Pump Casing (Lube Oil)	Pressure boundary	Gray Cast Iron	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
114	Sight Glass	Pressure boundary	Glass	Air-indoor uncontrolled (Internal)	None	None	VII.J-8	3.3.1-93	A 0306
115	Sight Glass	Pressure boundary	Glass	Raw water (Internal)	None	None	VII.J-11	3.3.1-93	A
116	Sight Glass	Pressure boundary	Glass	Air-indoor uncontrolled (External)	None	None	VII.J-8	3.3.1-93	A
117	Sight Glass	Pressure boundary	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	C 0302
118	Sight Glass	Pressure boundary	Steel	Raw water (Internal)	Loss of material	Fire Water	VII.G-24	3.3.1-68	A
119	Sight Glass	Pressure boundary	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
120	Spray Nozzle	Pressure boundary	Copper Alloy > 15% Zn	Air-indoor uncontrolled (Internal)	None	~~None~~ Insert: "Fire Water"	N/A	N/A	G Insert: "0327"

Table 3.3.2-22 Aging Management Review Results –Fire Protection System									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
121	Spray Nozzle	Pressure boundary	Copper Alloy > 15% Zn	Raw water (Internal)	Cracking	Fire Water	N/A	N/A	H 0318
122	Spray Nozzle	Pressure boundary	Copper Alloy > 15% Zn	Raw water (Internal)	Loss of material	Fire Water	VII.G-12	3.3.1-70	A 0317
123	Spray Nozzle	Pressure boundary	Copper Alloy > 15% Zn	Air-indoor uncontrolled (External)	None	~~None~~	N/A	N/A	G
124	Spray Nozzle	Spray	Copper Alloy > 15% Zn	Air-indoor uncontrolled (Internal)	None	~~None~~	N/A	N/A	G
125	Spray Nozzle	Spray	Copper Alloy > 15% Zn	Raw water (Internal)	Cracking	Fire Water	N/A	N/A	H 0318
126	Spray Nozzle	Spray	Copper Alloy > 15% Zn	Raw water (Internal)	Loss of material	Fire Water	VII.G-12	3.3.1-70	A 0317
127	Spray Nozzle	Spray	Copper Alloy > 15% Zn	Air-indoor uncontrolled (External)	None	~~None~~	N/A	N/A	G
128	Strainer (body)	Pressure boundary	Copper Alloy	Air-indoor uncontrolled (Internal)	None	None	N/A	N/A	G

Insert: "0327"

Insert: "Fire Water"

Table 3.3.2-22 Aging Management Review Results –Fire Protection System									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
177	Valve Body	Pressure boundary	Steel	Raw water (Internal)	Loss of material	Fire Water	VII.G-24	3.3.1-68	A
178	Valve Body	Pressure boundary	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
179	Valve Body	Pressure boundary	Steel	Air-outdoor (External)	Loss of material	External Surfaces Monitoring	VII.I-9	3.3.1-58	A
180	Valve Body	Pressure boundary	Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	VII.G-25	3.3.1-19	A

Insert new rows 181 through 183 for Table 3.3.2-22 as shown on page 3.3-256a

Table 3.3.2-22 Aging Management Review Results – Fire Protection System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
181	Bolting	Pressure boundary	Steel	Soil (External)	Cracking	Buried Piping and Tanks Inspection	N/A	N/A	G
182	Bolting	Pressure boundary	Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	N/A	N/A	G
183	Bolting	Pressure boundary	Steel	Soil (External)	Loss of pre-load	Buried Piping and Tanks Inspection	N/A	N/A	G

Table 3.3.2-24 Aging Management Review Results – Floor Drain Radioactive System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
37	Valve Body	Structural integrity	Stainless Steel	Raw water (Internal)	Loss of material	Monitoring and Collection Systems Inspection	VII.C1-15	3.3.1-79	E
38	Valve Body	Structural integrity	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A
39	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	C 0302
40	Valve Body	Structural integrity	Steel	Raw water (Internal)	Loss of material	Monitoring and Collection Systems Inspection	VII.C1-19	3.3.1-76	E
41	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A

Insert new rows 42 through 47 for Table 3.3.2-24 after this page

Amendment 1

Table 3.3.2-24 Aging Management Review Results – Floor Drain Radioactive System									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
42	Pump Casing (FDR-P-21)	Structural integrity	Stainless Steel	Raw water (Internal)	Loss of material	Monitoring and Collection Systems Inspection	VII.C1-15	3.3.1-79	E
43	Pump Casing (FDR-P-21)	Structural integrity	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A
44	Tank (FDR-TK-9)	Structural integrity	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	C 0302
45	Tank (FDR-TK-9)	Structural integrity	Steel	Moist air (Internal)	Loss of material	Supplemental Piping/Tank Inspection	VII.H2-21	3.3.1-71	E 0303
46	Tank (FDR-TK-9)	Structural integrity	Steel	Raw water (Internal)	Loss of material	Monitoring and Collection Systems Inspection	VII.C1-19	3.3.1-76	E
47	Tank (FDR-TK-9)	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A

Table 3.3.2-29 Aging Management Review Results – Potable Cold Water System									
Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
10	Pump Casing (PWC-P-4A/B)	Structural integrity	Copper Alloy > 15% Zn	Condensation (External)	Loss of material	Selective Leaching Inspection	N/A	N/A	G
11	Shock Suppressor	Structural integrity	Copper Alloy	Raw water (Internal)	Loss of material	Potable Water Monitoring	VII.C1-9	3.3.1-81	E
12	Shock Suppressor	Structural integrity	Copper Alloy	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.F1-16	3.3.1-25	E
13	Strainer (body)	Structural integrity	Copper Alloy > 15% Zn	Raw water (Internal)	Loss of material	Potable Water Monitoring	VII.C1-9	3.3.1-81	E
14	Strainer (body)	Structural integrity	Copper Alloy > 15% Zn	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.F1-16	3.3.1-25	E
15	Strainer (body)	Structural integrity	Copper Alloy > 15% Zn	Condensation (External)	Loss of material	Selective Leaching Inspection	N/A	N/A	G
16	Strainer (body)	Structural integrity	Copper Alloy > 15% Zn	Raw water (Internal)	Loss of material	Selective Leaching Inspection	VII.C1-10	3.3.1-84	A
17	Tank (shell and end cap)	Structural integrity	Aluminum	Raw water (Internal)	Loss of material	Potable Water Monitoring	VII.G-8	3.3.1-62	E
18	Tank (shell and end cap)	Structural integrity	Aluminum	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.F1-14	3.3.1-27	E

Insert: 0325

Amendment 1

Delete row 19

Table 3.3.2-29 Aging Management Review Results – Potable Cold Water System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
~~19~~	~~Tank (shell and end cap)~~	~~Structural integrity~~	~~Aluminum~~	~~Condensation (External)~~	~~Cracking~~	~~External Surfaces Monitoring~~	~~N/A~~	~~N/A~~	~~H~~
20	Tank (bushing)	Structural integrity	Gray Cast Iron	Raw water (Internal)	Loss of material	Potable Water Monitoring	VII.G-24	3.3.1-68	E
21	Tank (bushing)	Structural integrity	Gray Cast Iron	Raw water (Internal)	Loss of material	Selective Leaching Inspection	VII.C1-11	3.3.1-85	C
22	Tank (bushing)	Structural integrity	Gray Cast Iron	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.I-11	3.3.1-58	A
23	Tank (bushing)	Structural integrity	Gray Cast Iron	Condensation (External)	Loss of material	Selective Leaching Inspection	N/A	N/A	G
24	Tubing	Structural integrity	Copper Alloy	Raw water (Internal)	Loss of material	Potable Water Monitoring	VII.C1-9	3.3.1-81	E
25	Tubing	Structural integrity	Copper Alloy	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.F1-16	3.3.1-25	E
26	Tubing	Structural integrity	Copper Alloy > 15% Zn	Raw water (Internal)	Loss of material	Potable Water Monitoring	VII.C1-9	3.3.1-81	E
27	Tubing	Structural integrity	Copper Alloy > 15% Zn	Raw water (Internal)	Loss of material	Selective Leaching Inspection	VII.C1-10	3.3.1-84	A

Table 3.3.2-30 Aging Management Review Results – Potable Hot Water System									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
10	Valve Body	Structural integrity	Copper Alloy > 15% Zn	Air-indoor uncontrolled (External)	None	None	VIII.I-2	3.4.1-41	A

Insert new table rows 11 through 13 for Table 3.3.2-30, as show on page 3.3-291a

Table 3.3.2-30 Aging Management Review Results – Potable Hot Water System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
11	Tubing	Structural integrity	Copper Alloy > 15% Zn	Raw water (Internal)	Loss of material	Potable Water Monitoring	VII.C1-9	3.3.1-81	E
12	Tubing	Structural integrity	Copper Alloy > 15% Zn	Raw water (Internal)	Loss of material	Selective Leaching Inspection	VII.C1-10	3.3.1-84	A
13	Tubing	Structural integrity	Copper Alloy > 15% Zn	Air-indoor uncontrolled (External)	None	None	VIII.I-2	3.4.1-41	A

Table 3.3.2-32 Aging Management Review Results – Process Sampling System									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
10	Strainer (body)	Structural integrity	Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-19	3.3.1-76	B
11	Strainer (body)	Structural integrity	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.I-11	3.3.1-58	A
12	Tubing	Structural integrity	Copper Alloy	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-9	3.3.1-81	B
13	Tubing	Structural integrity	Copper Alloy	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.F1-16	3.3.1-25	E
14	Tubing	Structural integrity	Stainless Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-15	3.3.1-79	B
15	Tubing	Structural integrity	Stainless Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.F1-1	3.3.1-27	E
16	Valve Body	Structural integrity	Copper Alloy > 15% Zn	Raw water (Internal)	Cracking	~~Open-Cycle Cooling Water~~ Monitoring and Collection Systems Inspection	N/A	N/A	H
17	Valve Body	Structural integrity	Copper Alloy > 15% Zn	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-9	3.3.1-81	B
18	Valve Body	Structural integrity	Copper Alloy > 15% Zn	Raw water (Internal)	Loss of material	Selective Leaching Inspection	VII.C1-10	3.3.1-84	A

Amendment 1

Delete Row 36

Table 3.3.2-34 Aging Management Review Results – Pump House HVAC Systems									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
34	Heat Exchanger (header) (PRA-CC-1A/B, 91A/B)	Pressure boundary	Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-5	3.3.1-77	B
35	Heat Exchanger (header) (PRA-CC-1A/B, 91A/B)	Pressure boundary	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.I-11	3.3.1-58	A
~~36~~	Heat Exchanger ~~(fins) (PRA-~~ CC-1A/B, 91A/B)	~~Heat transfer~~	~~Aluminum~~	Condensation (External)	~~Cracking~~	Open-Cycle Cooling Water	~~N/A~~	~~N/A~~	~~H~~
37	Heat Exchanger (fins) (PRA-CC-1A/B, 91A/B)	Heat transfer	Aluminum	Condensation (External)	Loss of material	Open-Cycle Cooling Water	VII.F2-12	3.3.1-27	E
38	Heat Exchanger (fins) (PRA-CC-1A/B, 91A/B)	Heat transfer	Aluminum	Condensation (External)	Reduction in heat transfer	Open-Cycle Cooling Water	N/A	N/A	H
39	Heat Exchanger (tubes) (PRA-CC-1A/B, 91A/B)	Heat transfer	Copper Alloy	Raw water (Internal)	Reduction in heat transfer	Open-Cycle Cooling Water	VII.C1-6	3.3.1-83	B

Add: 0325

Amendment 1

Table 3.3.2-34 Aging Management Review Results – Pump House HVAC Systems									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
40	Heat Exchanger (tubes) (PRA-CC-1A/B, 91A/B)	Heat transfer	Copper Alloy	Condensation (External)	Reduction in heat transfer	Open-Cycle Cooling Water	N/A	N/A	H
41	Heat Exchanger (tubes) (PRA-CC-1A/B, 91A/B)	Pressure boundary	Copper Alloy	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-3	3.3.1-82	B
42	Heat Exchanger (tubes) (PRA-CC-1A/B, 91A/B)	Pressure boundary	Copper Alloy	Condensation (External)	Loss of material	Open-Cycle Cooling Water	VII.F2-14	3.3.1-25	E
43	Heat Exchanger (header) (PMA-CC-81A/B)	Pressure boundary	Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-5	3.3.1-77	B
44	Heat Exchanger (header) (PMA-CC-81A/B)	Pressure boundary	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.I-11	3.3.1-58	A
~~45~~	Heat Exchanger (fins) (PMA-CC-81A/B)	~~Heat transfer~~	~~Aluminum~~	Condensation (External)	~~Cracking~~	Open-Cycle Cooling Water	~~N/A~~	~~N/A~~	~~H~~

Delete Row 45

Amendment 1

Table 3.3.2-34 Aging Management Review Results – Pump House HVAC Systems

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
46	Heat Exchanger (fins) (PMA-CC-81A/B)	Heat transfer	Aluminum	Condensation (External)	Loss of material	Open-Cycle Cooling Water	VII.F2-12	3.3.1-27	E
47	Heat Exchanger (fins) (PMA-CC-81A/B)	Heat transfer	Aluminum	Condensation (External)	Reduction in heat transfer	Open-Cycle Cooling Water	N/A	N/A	H
48	Heat Exchanger (tubes) (PMA-CC-81A/B)	Heat transfer	Copper Alloy	Raw water (Internal)	Reduction in heat transfer	Open-Cycle Cooling Water	VII.C1-6	3.3.1-83	B
49	Heat Exchanger (tubes) (PMA-CC-81A/B)	Heat transfer	Copper Alloy	Condensation (External)	Reduction in heat transfer	Open-Cycle Cooling Water	N/A	N/A	H
50	Heat Exchanger (tubes) (PMA-CC-81A/B)	Pressure boundary	Copper Alloy	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-3	3.3.1-82	B
51	Heat Exchanger (tubes) (PMA-CC-81A/B)	Pressure boundary	Copper Alloy	Condensation (External)	Loss of material	Open-Cycle Cooling Water	VII.F2-14	3.3.1-25	E
52	Mechanical Sealants	Pressure boundary	Elastomer	Air-indoor uncontrolled (Internal)	Hardening and loss of strength	External Surfaces Monitoring	VII.F1-7	3.3.1-11	E
53	Mechanical Sealants	Pressure boundary	Elastomer	Air-indoor uncontrolled (External)	Hardening and loss of strength	External Surfaces Monitoring	VII.F1-7	3.3.1-11	E

Add: 0325

Amendment 1

Table 3.3.2-36 Aging Management Review Results – Radwaste Building HVAC Systems									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
1	Air-Handling Unit Housing (WMA-AH-~~51A/B,~~ 52A/B, 53A/B)	Pressure boundary	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	C 0302
2	Air-Handling Unit Housing (WMA-AH-~~51A/B,~~ 52A/B, 53A/B)	Pressure boundary	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
3	Bolting	Pressure boundary	Stainless Steel	Air-indoor uncontrolled (External)	Loss of pre-load	Bolting Integrity	N/A	N/A	F
4	Bolting	Pressure boundary	Steel	Air-indoor uncontrolled (External)	Loss of material	Bolting Integrity	VII.I-4	3.3.1-43	B
5	Bolting	Pressure boundary	Steel	Air-indoor uncontrolled (External)	Loss of pre-load	Bolting Integrity	VII.I-5	3.3.1-45	B
6	Bolting	Pressure boundary	Steel	Condensation (External)	Cracking	Bolting Integrity	N/A	N/A	H
7	Bolting	Pressure boundary	Steel	Condensation (External)	Loss of material	Bolting Integrity	VII.D-1	3.3.1-44	B
8	Bolting	Pressure boundary	Steel	Condensation (External)	Loss of pre-load	Bolting Integrity	N/A	N/A	H

Amendment 1

Table 3.3.2-36 Aging Management Review Results – Radwaste Building HVAC Systems									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
37	Heat Exchanger (header) (WMA-CC-51A2, 51B2, 52A2 & 52B2)	Pressure boundary	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.I-11	3.3.1-58	A
38	Heat Exchanger (fins) (WMA-CC-51A2, 51B2, 52A2 & 52B2)	Heat transfer	Aluminum	Condensation (External)	Cracking	Cooling Units Inspection	N/A	N/A	H
39	Heat Exchanger (fins) (WMA-CC-51A2, 51B2, 52A2 & 52B2)	Heat transfer	Aluminum	Condensation (External)	Loss of material	Cooling Units Inspection	VII.F2-12	3.3.1-27	E
40	Heat Exchanger (fins) (WMA-CC-51A2, 51B2, 52A2 & 52B2)	Heat transfer	Aluminum	Condensation (External)	Reduction in heat transfer	Cooling Units Inspection	N/A	N/A	H
~~41~~	~~Heat Exchanger (fins) (WMA-CC-53A2 & 53B2)~~	~~Heat transfer~~	~~Aluminum~~	~~Condensation (External)~~	~~Cracking~~	~~Open-Cycle Cooling Water~~	~~N/A~~	~~N/A~~	~~H~~

Delete Row 41

Amendment 1

Table 3.3.2-36 Aging Management Review Results – Radwaste Building HVAC Systems

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
42	Heat Exchanger (fins) (WMA-CC-53A2 & 53B2)	Heat transfer	Aluminum	Condensation (External)	Loss of material	Open-Cycle Cooling Water	VII.F2-12	3.3.1-27	E Add: 0325
43	Heat Exchanger (fins) (WMA-CC-53A2 & 53B2)	Heat transfer	Aluminum	Condensation (External)	Reduction in heat transfer	Open-Cycle Cooling Water	N/A	N/A	H
44	Heat Exchanger (tubes) (WMA-CC-51A1, 51B1, 52A1, 52B1, 53A1, 53A2, 53B1 & 53B2	Heat transfer	Copper Alloy	Condensation (External)	Reduction in heat transfer	Open-Cycle Cooling Water	N/A	N/A	H
45	Heat Exchanger (tubes) (WMA-CC-51A1, 51B1, 52A1, 52B1, 53A1, 53A2, 53B1 & 53B2)	Heat transfer	Copper Alloy	Raw water (Internal)	Reduction in heat transfer	Open-Cycle Cooling Water	VII.C1-6	3.3.1-83	B

Table 3.3.2-36 Aging Management Review Results – Radwaste Building HVAC Systems

Delete row 66

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
65	Piping	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
~~66~~	~~Piping~~	~~Structural integrity~~	~~Stainless Steel~~	~~Condensation (External)~~	~~Cracking~~	~~External Surfaces Monitoring~~	~~N/A~~	~~N/A~~	~~H~~
67	Piping	Structural integrity	Stainless Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.F2-1	3.3.1-27	E
68	Sound Absorber Casing	Pressure boundary	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	C 0302
69	Sound Absorber Casing	Pressure boundary	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
70	Strainer (body)	Structural integrity	Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-19	3.3.1-76	B
71	Strainer (body)	Structural integrity	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.I-11	3.3.1-58	A
72	Tubing	Pressure boundary	Copper Alloy	Air-indoor uncontrolled (Internal)	None	None	N/A	N/A	G
73	Tubing	Pressure boundary	Copper Alloy	Air-indoor uncontrolled (External)	None	None	N/A	N/A	G

Amendment 1

Table 3.3.2-36 Aging Management Review Results – Radwaste Building HVAC Systems

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
92	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
93	Valve Body	Structural integrity	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.I-11	3.3.1-58	A

Insert new rows 94 through 99 for Table 3.3.2-36 as shown on page 3.3-328a

Table 3.3.2-36 Aging Management Review Results – Radwaste Building HVAC Systems									
Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
94	Air-Handling Unit Housing (WMA-AH-51A/B)	Pressure boundary	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	C0302
95	Air-Handling Unit Housing (WMA-AH-51A/B)	Pressure boundary	Steel	Condensation (Internal)	Loss of material	Cooling Units Inspection	VII.G-23	3.3.1-71	E0326
96	Air-Handling Unit Housing (WMA-AH-51A/B)	Pressure boundary	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
97	Bolting	Pressure boundary	Steel	Soil (External)	Cracking	Buried Piping and Tanks Inspection	N/A	N/A	G
98	Bolting	Pressure boundary	Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	N/A	N/A	G
99	Bolting	Pressure boundary	Steel	Soil (External)	Loss of pre-load	Buried Piping and Tanks Inspection	N/A	N/A	G

Table 3.3.2-37 Aging Management Review Results – Reactor Building HVAC Systems									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
33	Heat Exchanger (housing) (ROA-HC-1 & 2)	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
34	Heat Exchanger (header) (RRA-CC-1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 14, 15, 17, 19 & 20)	Pressure boundary	Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-5	3.3.1-77	B
35	Heat Exchanger (header) (RRA-CC-1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 14, 15, 17, 19 & 20)	Pressure boundary	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.I-11	3.3.1-58	A
~~36~~	Heat Exchanger (fins) (RRA-~~CC-1, 2, 3, 4,~~ 5, 6, 10, 11, 12, 13, 14, 15, 17, 19 & 20)	~~Heat transfer~~	~~Aluminum~~	Condensation (External)	~~Cracking~~	Open-Cycle Cooling Water	~~N/A~~	~~N/A~~	~~H~~

Delete Row 36

Amendment 1

Table 3.3.2-37 Aging Management Review Results – Reactor Building HVAC Systems

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
37	Heat Exchanger (fins) (RRA-CC-1, 2, 3, 4, 5, 6, 10, 11, ~~12, 13, 14, 15~~, ~~17, 19 & 20~~)	Heat transfer	Aluminum	Condensation (External)	Loss of material	Open-Cycle Cooling Water	VII.F2-12	3.3.1-27	E
38	Heat Exchanger (fins) (RRA-CC-1, 2, 3, 4, 5, 6, 10, 11, ~~12, 13, 14, 15, 17, 19 & 20~~)	Heat transfer	Aluminum	Condensation (External)	Reduction in heat transfer	Open-Cycle Cooling Water	N/A	N/A	H
39	Heat Exchanger (header) (ROA-HC-1 & 2)	Structural integrity	Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
40	Heat Exchanger (header) (ROA-HC-1 & 2)	Structural integrity	Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
41	Heat Exchanger (header) (ROA-HC-1 & 2)	Structural integrity	Steel	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G

Add:
0325

Amendment 1

Table 3.3.2-37 Aging Management Review Results – Reactor Building HVAC Systems

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
80	Valve Body	Structural integrity	Steel	Raw water (Internal)	Loss of material	Potable Water Monitoring	VII.C1-19	3.3.1-76	E
81	Valve Body	Structural integrity	Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
82	Valve Body	Structural integrity	Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
83	Valve Body	Structural integrity	Steel	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
84	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
85	Valve Body	Structural integrity	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.I-11	3.3.1-58	A

Insert new rows 86 and 87 from Page 3.3-340a

Table 3.3.2-37 Aging Management Review Results – Reactor Building HVAC Systems									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
86	Heat Exchanger (fins) (RRA-CC-12, 13, 14, 15, 17, 19, & 20)	Heat transfer	Copper Alloy	Condensation (External)	Loss of material	Open-Cycle Cooling Water	VII.F2-14	3.3.1-25	E
87	Heat Exchanger (fins) (RRA-CC-12, 13, 14, 15, 17, 19, & 20)	Heat transfer	Copper Alloy	Condensation (External)	Reduction in heat transfer	Open-Cycle Cooling Water	N/A	N/A	H

Table 3.3.2-42 Aging Management Review Results – Standby Service Water System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
105	Valve Body	Structural integrity	Stainless Steel	Air-indoor uncontrolled (Internal)	None	None	VII.J-15	3.3.1-94	A 0306
106	Valve Body	Structural integrity	Stainless Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-15	3.3.1-79	B
107	Valve Body	Structural integrity	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A
108	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	C 0302
109	Valve Body	Structural integrity	Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-19	3.3.1-76	B
110	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A

Add new rows 111 through 116 shown on page 3.3-390a

Amendment 1

Table 3.3.2-42 Aging Management Review Results – Standby Service Water System									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
111	Bolting	Pressure boundary	Steel	Soil (External)	Cracking	Buried Piping and Tanks Inspection	N/A	N/A	G
112	Bolting	Pressure boundary	Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	N/A	N/A	G
113	Bolting	Pressure boundary	Steel	Soil (External)	Loss of pre-load	Buried Piping and Tanks Inspection	N/A	N/A	G
114	Orifice	Pressure boundary	Stainless Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	VII.C1-16	3.3.1-29	E
115	Piping	Pressure boundary	Stainless Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	VII.C1-16	3.3.1-29	E
116	Valve body	Pressure boundary	Stainless Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	VII.C1-16	3.3.1-29	E

Table 3.3.2-43 Aging Management Review Results – Tower Makeup Water System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
37	Valve Body	Pressure boundary	Steel	Raw water (Internal)	Loss of material	Open-Cycle Cooling Water	VII.C1-19	3.3.1-76	B
38	Valve Body	Pressure boundary	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
39	Valve Body	Pressure boundary	Steel	Air-outdoor (External)	Loss of material	External Surfaces Monitoring	VII.I-9	3.3.1-58	A
40	Valve Body	Pressure boundary	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VII.I-11	3.3.1-58	A

Insert new rows 41 through 44 for Table 3.3.2-43 as shown on page 3.3-395a

Amendment 1

Table 3.3.2-43 Aging Management Review Results – Tower Makeup Water System									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
41	Bolting	Pressure boundary	Steel	Soil (External)	Cracking	Buried Piping and Tanks Inspection	N/A	N/A	G
42	Bolting	Pressure boundary	Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	N/A	N/A	G
43	Bolting	Pressure boundary	Steel	Soil (External)	Loss of pre-load	Buried Piping and Tanks Inspection	N/A	N/A	G
44	Valve Body	Pressure boundary	Steel	Soil (External)	Loss of material	Buried Piping and Tanks Inspection	VII.C1-18	3.3.1-19	A

Table 3.3.2-44 Aging Management Review Results – Traversing Incore Probe System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
10	Piping	Structural integrity	Stainless Steel	Air-indoor uncontrolled (Internal)	None	None	VII.J-15	3.3.1-94	A 0306
11	Piping	Structural integrity	Stainless Steel	Gas (Internal)	None	None	VII.J-19	3.3.1-97	A
12	Piping	Structural integrity	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A
13	Valve Body	Pressure boundary	Stainless Steel	Air-indoor uncontrolled (Internal)	None	None	VII.J-15	3.3.1-94	A 0306
14	Valve Body	Pressure boundary	Stainless Steel	Gas (Internal)	None	None	VII.J-19	3.3.1-97	A
15	Valve Body	Pressure boundary	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A
16	Valve Body	Structural integrity	Stainless Steel	Air-indoor uncontrolled (Internal)	None	None	VII.J-15	3.3.1-94	A 0306
17	Valve Body	Structural integrity	Stainless Steel	Gas (Internal)	None	None	VII.J-19	3.3.1-97	A
18	Valve Body	Structural integrity	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A

Insert new LRA Tables 3.3.2-45, 3.3.2-46, and 3.3.2-47 after this page

Amendment 1

Table 3.3.2-45 Aging Management Review Results – Heating Steam System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
1	Bolting	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	Bolting Integrity	VII.I-4	3.3.1-43	B
2	Bolting	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of pre-load	Bolting Integrity	VII.I-5	3.3.1-45	B
3	Heat Exchanger (header) (WOA-HC-1)	Structural integrity	Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
4	Heat Exchanger (header) (WOA-HC-1)	Structural integrity	Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
5	Heat Exchanger (header) (WOA-HC-1)	Structural integrity	Steel	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
6	Heat Exchanger (header) (WOA-HC-1)	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
7	Heat Exchanger (header) (WRA-SUH-4, 5, 6)	Structural integrity	Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
8	Heat Exchanger (header) (WRA-SUH-4, 5, 6)	Structural integrity	Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G

Table 3.3.2-45 Aging Management Review Results – Heating Steam System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
9	Heat Exchanger (header) (WRA-SUH-4, 5, 6)	Structural integrity	Steel	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
10	Heat Exchanger (header) (WRA-SUH-4, 5, 6)	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
11	Heat Exchanger (tubes) (WOA-HC-1)	Structural integrity	Copper Alloy	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
12	Heat Exchanger (tubes) (WOA-HC-1)	Structural integrity	Copper Alloy	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
13	Heat Exchanger (tubes) (WOA-HC-1)	Structural integrity	Copper Alloy	Air-indoor uncontrolled (External)	None	None	N/A	N/A	G
14	Heat Exchanger (tubes) (WRA-SUH-1, 3, 4, 5)	Structural integrity	Stainless Steel	Steam (Internal)	Cracking	BWR Water Chemistry	N/A	N/A	G
15	Heat Exchanger (tubes) (WRA-SUH-1, 3, 4, 5)	Structural integrity	Stainless Steel	Steam (Internal)	Cracking	Chemistry Program Effectiveness Inspection	N/A	N/A	G

Table 3.3.2-45 Aging Management Review Results – Heating Steam System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
16	Heat Exchanger (tubes) (WRA-SUH-1, 3, 4, 5)	Structural integrity	Stainless Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
17	Heat Exchanger (tubes) (WRA-SUH-1, 3, 4, 5)	Structural integrity	Stainless Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
18	Heat Exchanger (tubes) (WRA-SUH-1, 3, 4, 5)	Structural integrity	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	C
19	Humidifier (WMA-HU-6, WOA-HU-4, 5, 9)	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
20	Humidifier (WMA-HU-6, WOA-HU-4, 5, 9)	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Chemistry Program Effectiveness	N/A	N/A	G
21	Humidifier (WMA-HU-6, WOA-HU-4, 5, 9)	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
22	Humidifier (WMA-HU-6, WOA-HU-4, 5, 9)	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Selective Leaching Inspection	N/A	N/A	G

Table 3.3.2-45 Aging Management Review Results – Heating Steam System									
Row No.	***Component* Type**	***Intended* Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	***Aging Management* Program**	**NUREG-*1801* Volume 2 Item**	***Table* 1 Item**	**Notes**
23	Humidifier (WMA-HU-6, WOA-HU-4, 5, 9)	Structural integrity	Gray Cast Iron	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
24	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
25	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
26	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
27	Piping	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
28	Strainer (body)	Structural integrity	Copper Alloy	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
29	Strainer (body)	Structural integrity	Copper Alloy	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
30	Strainer (body)	Structural integrity	Copper Alloy	Air-indoor uncontrolled (External)	None	None	N/A	N/A	G
31	Trap Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G

Table 3.3.2-45 Aging Management Review Results – Heating Steam System									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
32	Trap Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
33	Trap Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
34	Trap Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Selective Leaching Inspection	N/A	N/A	G
35	Trap Body	Structural integrity	Gray Cast Iron	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
36	Tubing	Structural integrity	Stainless Steel	Steam (Internal)	Cracking	BWR Water Chemistry	N/A	N/A	G
37	Tubing	Structural integrity	Stainless Steel	Steam (Internal)	Cracking	Chemistry Program Effectiveness Inspection	N/A	N/A	G
38	Tubing	Structural integrity	Stainless Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
39	Tubing	Structural integrity	Stainless Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
40	Tubing	Structural integrity	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VII.J-15	3.3.1-94	A

Table 3.3.2-45 Aging Management Review Results – Heating Steam System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
41	Valve Body	Structural integrity	Copper Alloy	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
42	Valve Body	Structural integrity	Copper Alloy	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
43	Valve Body	Structural integrity	Copper Alloy	Air-indoor uncontrolled (External)	None	None	N/A	N/A	G
44	Valve Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
45	Valve Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
46	Valve Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
47	Valve Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Selective Leaching Inspection	N/A	N/A	G
48	Valve Body	Structural integrity	Gray Cast Iron	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
49	Valve Body	Structural integrity	Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G

Table 3.3.2-45 Aging Management Review Results – Heating Steam System									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
50	Valve Body	Structural integrity	Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
51	Valve Body	Structural integrity	Steel	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
52	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A

Table 3.3.2-46 Aging Management Review Results – Heating Steam Condensate System									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
1	Bolting	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	Bolting Integrity	VII.I-4	3.3.1-43	B
2	Bolting	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of pre-load	Bolting Integrity	VII.I-5	3.3.1-45	B
3	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
4	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
5	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
6	Piping	Structural integrity	Steel	Treated water > 60 °C (140 °F) (Internal)	Loss of material	BWR Water Chemistry	VII.E3-18	3.3.1-17	A 0305
7	Piping	Structural integrity	Steel	Treated water > 60 °C (140 °F) (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VII.E3-18	3.3.1-17	A 0305
8	Piping	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
9	Pump Casing (WHCO-P-1A, 1B)	Structural integrity	Gray Cast Iron	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	C 0302

Table 3.3.2-46 Aging Management Review Results – Heating Steam Condensate System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
10	Pump Casing (WHCO-P-1A, 1B)	Structural integrity	Gray Cast Iron	Moist air (Internal)	Loss of material	Supplemental Piping/Tank Inspection	VII.H2-21	3.3.1-71	E 0303
11	Pump Casing (WHCO-P-1A, 1B)	Structural integrity	Gray Cast Iron	Treated water > 60 °C (140 °F) (Internal)	Loss of material	BWR Water Chemistry	VII.E3-18	3.3.1-17	A 0305
12	Pump Casing (WHCO-P-1A, 1B)	Structural integrity	Gray Cast Iron	Treated water > 60 °C (140 °F) (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VII.E3-18	3.3.1-17	A 0305
13	Pump Casing (WHCO-P-1A, 1B)	Structural integrity	Gray Cast Iron	Treated water > 60 °C (140 °F) (Internal)	Loss of material	Selective Leaching Inspection	VII.E3-12	3.3.1-85	A 0305
14	Pump Casing (WHCO-P-1A, 1B)	Structural integrity	Gray Cast Iron	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
15	Strainer (body)	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
16	Strainer (body)	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
17	Strainer (body)	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
18	Strainer (body)	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Selective Leaching Inspection	N/A	N/A	G

Table 3.3.2-46 Aging Management Review Results – Heating Steam Condensate System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
19	Strainer (body)	Structural integrity	Gray Cast Iron	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
20	Tank (WHCO-CU-1)	Structural integrity	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	C 0302
21	Tank (WHCO-CU-1)	Structural integrity	Steel	Moist air (Internal)	Loss of material	Supplemental Piping/Tank Inspection	VII.H2-21	3.3.1-71	E 0303
22	Tank (WHCO-CU-1)	Structural integrity	Steel	Treated water > 60 °C (140 °F) (Internal)	Loss of material	BWR Water Chemistry	VII.E3-18	3.3.1-17	C 0305
23	Tank (WHCO-CU-1)	Structural integrity	Steel	Treated water > 60 °C (140 °F) (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VII.E3-18	3.3.1-17	C 0305
24	Tank (WHCO-CU-1)	Structural integrity	Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
25	Tank (WHCO-CU-1)	Structural integrity	Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
26	Tank (WHCO-CU-1)	Structural integrity	Steel	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
27	Tank (WHCO-CU-1)	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A

Table 3.3.2-46 Aging Management Review Results – Heating Steam Condensate System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
28	Trap Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
29	Trap Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
30	Trap Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
31	Trap Body	Structural integrity	Gray Cast Iron	Steam (Internal)	Loss of material	Selective Leaching Inspection	N/A	N/A	G
32	Trap Body	Structural integrity	Gray Cast Iron	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A
33	Tubing	Structural integrity	Copper Alloy	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
34	Tubing	Structural integrity	Copper Alloy	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
35	Tubing	Structural integrity	Copper Alloy	Treated water > 60 °C (140 °F) (Internal)	Loss of material	BWR Water Chemistry	VII.E3-9	3.3.1-31	A 0305
36	Tubing	Structural integrity	Copper Alloy	Treated water > 60 °C (140 °F) (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VII.E3-9	3.3.1-31	A 0305

Table 3.3.2-46 Aging Management Review Results – Heating Steam Condensate System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
37	Tubing	Structural integrity	Copper Alloy	Air-indoor uncontrolled (External)	None	None	N/A	N/A	G
38	Valve Body	Structural integrity	Copper Alloy	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
39	Valve Body	Structural integrity	Copper Alloy	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
40	Valve Body	Structural integrity	Copper Alloy	Treated water > 60 °C (140 °F) (Internal)	Loss of material	BWR Water Chemistry	VII.E3-9	3.3.1-31	A 0305
41	Valve Body	Structural integrity	Copper Alloy	Treated water > 60 °C (140 °F) (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VII.E3-9	3.3.1-31	A 0305
42	Valve Body	Structural integrity	Copper Alloy	Air-indoor uncontrolled (External)	None	None	N/A	N/A	G
43	Valve Body	Structural integrity	Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
44	Valve Body	Structural integrity	Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
45	Valve Body	Structural integrity	Steel	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G

Table 3.3.2-46 Aging Management Review Results – Heating Steam Condensate System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
46	Valve Body	Structural integrity	Steel	Treated water > 60 °C (140 °F) (Internal)	Loss of material	BWR Water Chemistry	VII.E3-18	3.3.1-17	A 0305
47	Valve Body	Structural integrity	Steel	Treated water > 60 °C (140 °F) (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VII.E3-18	3.3.1-17	A 0305
48	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A

Table 3.3.2-47 Aging Management Review Results – Heating Steam Vent System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
1	Bolting	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	Bolting Integrity	VII.I-4	3.3.1-43	B
2	Bolting	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of pre-load	Bolting Integrity	VII.I-5	3.3.1-45	B
3	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	N/A	N/A	G
4	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	N/A	N/A	G
5	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	N/A	N/A	G
6	Piping	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VII.I-8	3.3.1-58	A

Plant-Specific Notes:	
0315	The BWR Water Chemistry Program and Chemistry Program Effectiveness Inspection will manage loss of material of components submerged in the suppression pool and subject to a treated water environment.
0316	The fire protection diesel engine coolant (antifreeze) is evaluated as Raw Water.
0317	The Fire Water Program also manages loss of material due to selective leaching of fire sprinkler system spray nozzles that are normally exposed to a raw water (internal) environment. The copper alloy spray nozzles are inspected or replaced in accordance with the Fire Water Program; the inspection includes detection of selective leaching.
0318	For conservatism, it is assumed that ammonia or ammonium compounds are present in the raw water environment as a by-product of organic decay, as a by-product of MIC, or possibly from fertilizers.
0319	Subject component is exposed to reactor closed cooling (RCC) water.
0320	Subject component has an air-water interface that constitutes an agressive environment.
0321	Subject component is exposed to plant service water (TSW).
0322	Environment is predominantly outdoor air with infrequent, and for short duration, exposure to diesel exhaust.
0323	The internal environment between the outer and inner vessels of CN-TK-1 is conservatively evaluated as air instead of as a vacuum. Since the external surface is exposed to the more aggressive outdoor air environment, aging effects will occur on the external surface before they occur on the internal surface.
0324	The aging effect determination for the Air-outdoor (Internal) environment is the same as the NUREG-1801 determination for an Air-outdoor (External) environment because the material is the same and the internal environment is equivalent to the external environment evaluated in the NUREG-1801 item. Monitoring of the external surface condition will be used to characterize the aging effects on the internal surfaces.

Insert A shown on page 3.3-400a

Amendment 1

Insert A to LRA Page 3.3-400

0325	The material is not aluminum alloy > 12% Zinc or 6% Magnesium, which is required for the mechanism of cracking due to stress corrosion cracking to be applicable.
0326	Based on a review of recent operating experience, the bottom portion of the air-handling unit housings for WMA-AH-51A/B are evaluated as exposed to an internal environment of condensation.
0327	No aging effects requiring management have been identified. However, for all brass (copper alloy > 15% Zn) spray nozzles that are in the scope of license renewal, the Fire Water Program is credited to provide confirmation of the absence of significant aging effects during the period of extended operation.

3.4 AGING MANAGEMENT OF STEAM AND POWER CONVERSION SYSTEMS

3.4.1 Introduction

Section 3.4 provides the results of the aging management reviews (AMRs) for those components identified in Section 2.3.4, Steam and Power Conversion Systems, as subject to AMR. The systems or portions of systems are described in the indicated sections of the Application.

- Auxiliary Steam System (Section 2.3.4.1)
- Condensate (Auxiliary) System (Section 2.3.4.2)
- Condensate (Nuclear) System (Section 2.3.4.3)
- Main Steam System (Section 2.3.4.4)
- Main Steam Leakage Control System (Section 2.3.4.5)
- Miscellaneous Drain System (Section 2.3.4.6)
- Reactor Feedwater System (Section 2.3.4.7) Insert A from page 3.4-1a

Table 3.4.1, Summary of Aging Management Programs for Steam and Power Conversion Systems Evaluated in Chapter VIII of NUREG-1801, provides the summary of the programs evaluated in NUREG-1801 that are applicable to component and commodity groups in this section. Text addressing summary items requiring further evaluation is provided in Section 3.4.2.2.

3.4.2 Results

The following tables summarize the results of the AMR for the Steam and Power Conversion Systems.

Table 3.4.2-1	Aging Management Review Results - Auxiliary Steam System
Table 3.4.2-2	Aging Management Review Results - Condensate (Auxiliary) System
Table 3.4.2-3	Aging Management Review Results - Condensate (Nuclear) System
Table 3.4.2-4	Aging Management Review Results - Main Steam System
Table 3.4.2-5	Aging Management Review Results - Main Steam Leakage Control System
Table 3.4.2-6	Aging Management Review Results - Miscellaneous Drain System
Table 3.4.2-7	Aging Management Review Results - Reactor Feedwater System

Insert B from page 3.4-1a

Amendment 1

Insert A to LRA Section 3.4.1

- Sealing Steam System (Section 2.3.4.8)

Insert B to LRA Section 3.4.2

Table 3.4.2-8 Aging Management Review Results – Sealing Steam System

- Chemistry Program Effectiveness Inspection
- External Surfaces Monitoring Program
- Flow-Accelerated Corrosion (FAC) Program
- Selective Leaching Inspection

3.4.2.1.2 Condensate (Auxiliary) System

Materials

The materials of construction for subject mechanical components of the Condensate (Auxiliary) System are:

- Gray cast iron
- Steel

Environments

Subject mechanical components of the Condensate (Auxiliary) System are exposed to the following normal operating environments:

- Air-indoor uncontrolled
- Air-outdoor
- Treated water > 60 °C (140 °F)

Add: "Moist air"

Aging Effects Requiring Management

The following aging effects require management for the subject mechanical components of the Condensate (Auxiliary) System:

- Loss of material
- Loss of pre-load

Aging Management Programs

The following aging management programs manage the aging effects for subject mechanical components of the Condensate (Auxiliary) System:

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- External Surfaces Monitoring Program

Add: "Supplemental Piping/Tank Inspection"

Amendment 1

Aging Management Programs

The following aging management programs manage the aging effects for the subject mechanical components of the Reactor Feedwater System:

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- External Surfaces Monitoring Program
- Flow-Accelerated Corrosion (FAC) Program

Insert new Section 3.4.2.1.8 from page 3.4-9a

3.4.2.2 Further Evaluation of Aging Management as Recommended by NUREG-1801

For the Steam and Power Conversion systems, those items requiring further evaluation are addressed in the following sections.

3.4.2.2.1 Cumulative Fatigue Damage

Fatigue is a time-limited aging analysis, as defined in 10 CFR 54.3. Time-limited aging analyses are required to be evaluated in accordance with 10 CFR 54.21(c). Time-limited aging analyses identified for fatigue in the Steam and Power Conversion systems are evaluated in Section 4.3.4.

3.4.2.2.2 Loss of Material due to General, Pitting, and Crevice Corrosion

3.4.2.2.2.1 Piping, Piping Components, Piping Elements, Tanks, and Heat Exchangers

Loss of material due to general, pitting, and crevice corrosion for steel piping components and tanks exposed to treated water (including steam) in the Steam and Power Conversion systems is managed by the BWR Water Chemistry Program. The BWR Water Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a verification of the effectiveness of the BWR Water Chemistry Program to manage loss of material due to general, pitting, and crevice corrosion through examination of steel piping components and tanks exposed to treated water.

3.4.2.2.2.2 Piping, Piping Components, and Piping Elements – Lubricating Oil

As described in Table 3.4.1, there are no components compared to item number 3.4.1-07. There are no steel components exposed to a lubricating oil environment that are subject to AMR for the Steam and Power Conversion systems.

3.4.2.1.8 Sealing Steam System

Materials

The materials of construction for subject mechanical components of the Sealing Steam System are:

- Steel

Environments

Subject mechanical components of the Sealing Steam System are exposed to the following normal operating environments:

- Air-indoor uncontrolled
- Steam

Aging Effects Requiring Management

The following aging effects require management for the subject mechanical components of the Sealing Steam System:

- Loss of material

Aging Management Programs

The following aging management programs manage the aging effects for subject mechanical components of the Sealing Steam System:

- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- External Surfaces Monitoring Program
- Flow-Accelerated Corrosion (FAC) Program

Table 3.4.1 Summary of Aging Management Programs for Steam and Power Conversion Systems *Evaluated in Chapter VIII of NUREG-1801*

Item Number	Component/Commodity	Aging Effect/ Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.4.1-04	Steel piping, piping components, and piping elements exposed to treated water	Loss of material due to general, pitting and crevice corrosion	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801. ~~The BWR Water Chemistry Program, in conjunction with the Chemistry Program Effectiveness Inspection, is credited to manage loss of material for steel piping, piping components, and piping elements in the steam and power conversion systems exposed to treated water, including treated water >60 C (140 °F).~~ Refer to Section 3.4.2.2.2.1 for further information.

Insert A from page 3.4-14a

Insert A to Page 3.4.-14

The BWR Water Chemistry Program, in conjunction with the Chemistry Program Effectiveness Inspection, is credited to manage loss of material for steel piping, piping components, piping elements and tanks in the steam and power conversion systems exposed to treated water, including treated water >60 °C (140 °F).

Table 3.4.2-2 Aging Management Review Results – Condensate (Auxiliary) System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
18	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (External)	None	None	VIII.H-7	3.4.1-28	I 0406
19	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VIII.H-7	3.4.1-28	C 0404
20	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VIII.H-7	3.4.1-28	A

Add new rows 21 through 25 to Table 3.4.2-2 as shown on pages 3.4-43a

Table 3.4.2-2				Aging Management Review Results – Condensate (Auxiliary) System					
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
21	Tank (CO-TK-4)	Structural integrity	Steel	Air-indoor uncontrolled (Internal)	Loss of material	External Surfaces Monitoring	VIII.H-7	3.4.1-28	C 0404
22	Tank (CO-TK-4)	Structural integrity	Steel	Moist air (Internal)	Loss of material	Supplemental Piping/Tank Inspection	N/A	N/A	G
23	Tank (CO-TK-4)	Structural integrity	Steel	Treated water > 60 °C (140 °F) (Internal)	Loss of material	BWR Water Chemistry	VIII.E-33	3.4.1-04	C
24	Tank (CO-TK-4)	Structural integrity	Steel	Treated water > 60 °C (140 °F) (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VIII.E-33	3.4.1-04	C
25	Tank (CO-TK-4)	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VIII.H-7	3.4.1-28	A

Table 3.4.2-3 Aging Management Review Results – Condensate (Nuclear) System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
78	Valve Body	Structural integrity	Stainless Steel	Air-indoor uncontrolled (External)	None	None	VIII.I-10	3.4.1-41	A
79	Valve Body	Structural integrity	Stainless Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	N/A	N/A	G
80	Valve Body	Structural integrity	Steel	Treated water (Internal)	Loss of material	BWR Water Chemistry	VIII.E-33	3.4.1-04	A
81	Valve Body	Structural integrity	Steel	Treated water (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VIII.E-33	3.4.1-04	A
82	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VIII.H-7	3.4.1-28	A
83	Valve Body	Structural integrity	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VIII.H-10	3.4.1-28	A

Insert new rows 84 through 87 to Table 3.4.2-3 as shown on page 3.4-53a

Table 3.4.2-3 Aging Management Review Results – Condensate (Nuclear) System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
84	Flexible Connection	Structural integrity	Steel	Treated water (Internal)	Loss of material	BWR Water Chemistry	VIII.E-33	3.4.1-04	A
85	Flexible Connection	Structural integrity	Steel	Treated water (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VIII.E-33	3.4.1-04	A
86	Flexible Connection	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VIII.H-7	3.4.1-28	A
87	Flexible Connection	Structural integrity	Steel	Condensation (External)	Loss of material	External Surfaces Monitoring	VIII.H-10	3.4.1-28	A

Table 3.4.2-7	Aging Management Review Results – Reactor Feedwater System								
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
17	Valve Body	Structural integrity	Steel	Treated water > 60 °C (140 °F) (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VIII.D2-7	3.4.1-04	A 0403
18	Valve Body	Structural integrity	Steel	Treated water > 60 °C (140 °F) (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	VIII.D2-8	3.4.1-29	A 0403
19	Valve Body	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VIII.H-7	3.4.1-28	A

Insert New Table 3.4.2-8 from page 3.4-76a

Table 3.4.2-8 Aging Management Review Results – Sealing Steam System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
1	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	BWR Water Chemistry	VIII.C-4	3.4.1-02	A
2	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	Chemistry Program Effectiveness Inspection	VIII.C-4	3.4.1-02	A
3	Piping	Structural integrity	Steel	Steam (Internal)	Loss of material	Flow-Accelerated Corrosion (FAC)	VIII.C-5	3.4.1-29	A
4	Piping	Structural integrity	Steel	Air-indoor uncontrolled (External)	Loss of material	External Surfaces Monitoring	VIII.H-7	3.4.1-28	A

Plant-Specific Notes:	
0404	The aging effect determination for the Air-indoor uncontrolled (Internal) environment is the same as the NUREG-1801 determination for an Air-indoor uncontrolled (External) environment because the material is the same and the internal environment is equivalent to the external environment evaluated in the NUREG-1801 item Monitoring of the external surface condition will be used to characterize the aging effects on the internal surfaces.
0405	Bolting associated with the quenchers is stainless steel and located in the suppression pool.
0406	This steel component has an external surface temperature > 212 °F. Therefore, the surface is dry and general corrosion is not an aging effect requiring management; there are also no other aging effects requiring management.
0407	The Bolting Integrity Program will also manage cracking for the carbon and low-alloy (steel) bolting at the base and foundation of the CSTs due to potential for ponding or pooling of water.
0408	The Buried Piping and Tanks Inspection Program will manage loss of material for the carbon steel (steel) piping from the CSTs that is enclosed in guard pipe and buried.
0409	The Aboveground Steel Tanks Inspection will detect and characterize loss of material at the base of each CST in contact with the tank foundation.
0410	The aging effect determination for the Air-indoor uncontrolled (Internal) environment is the same as the NUREG-1801 determination for an Air-indoor uncontrolled (External) environment because the material is the same and the internal environment is equivalent to the external environment evaluated in the NUREG-1801 item There are no aging effects requiring management.
0411	The aging effect determination for the Air-outdoor (Internal) environment is the same as the NUREG-1801 determination for an Air-outdoor (External) environment because the material is the same and the internal environment is equivalent to the external environment evaluated in the NUREG-1801 item. Monitoring of the external surface condition will be used to characterize the aging effects on the internal surfaces.

Add:
0412 - The normal environment of the Sealing Steam System is evaluated as a steam environment from when the steam evaporator relief valves are actuated.

Table 3.5.2-5 Aging Management Review Results – Diesel Generator Building

Row No.	Component / Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
10	Roof	EN, MB, SRE, SSR	Concrete	Air-indoor	None	Structures Monitoring Program	N/A	N/A	I 0501 0526

1 Refer to Table 2.0-1 for intended function descriptions.

Add new rows 11 and 12 to Table 3.5.2-5 shown on page 3.5-98a

Amendment 1

Insert A to page 3.5-98

Table 3.5.2-5 Aging Management Review Results – Diesel Generator Building									
Row No.	**Component / Commodity**	**Intended Function**[1]	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
11	South Exterior Slab	SRE	Concrete	Air-outdoor	None	Structures Monitoring Program	N/A	N/A	I 0501
12	South Exterior Slab	SRE	Concrete	Soil	None	Structures Monitoring Program	N/A	N/A	I 0501

Replace this page in its entirety with page 4.3-4a

f Columbia is analyzed for 120 startups and shutdowns. The 120 startups consist of 117 normal startups and 3 natural circulation startups. The 120 shutdowns consist of 111 normal shutdowns, 8 single safety or relief valve blowdowns, and 1 rapid depressurization with delayed trip.

Table 4.3-2
Actual Cycles and Projected Cycles

Conditions	Analyzed cycles	Actual cycles 12/13/1984 through 7/31/2007	60 year (12/13/2044) projection(3)	Cycles for future analyses(4)
Boltup/Unbolt	123	21	55	60
Reactor Startup (100 degF/hr)	120	88	233	250
Reactor Shutdown (100 degF/hr)	111	87	230	242
Vessel Pressure Tests	130	2(1, 2)	2(1)	60
Loss of Feedwater Heaters	80	0	0	80
Scram - Loss of feedwater pumps, isolation valves closed	10	7	18	20
Scram - Single safety relief valve blowdown	8	0	0	8
Scram - TG trip, FW on, isolation valves open	40	22	58	60
Scram - Other	140	34	90	90
LPCS operation	10	0	0	10
HPCS operation	10	4	10	10(4)
LPCI operation	10	0	0	10
SLC operation	10	0	0	10

(1) Vessel hydrostatic pressure tests are no longer performed. Vessel operational leak tests have replaced the hydrostatic pressure tests.
(2) These two pressure tests were hydrostatic pressure tests.
(3) Projections were not changed for those events that have not occurred.
(4) The 20 Scrams with Loss of Feedwater assume 3 HPCS injections per scram. The HPCS initiation assumes 10 additional injections without a scram. The HPCS nozzle is analyzed for 70 cycles combined from the two events.

Amendment 1

f Columbia is analyzed for 120 startups and shutdowns. The 120 startups consist of 117 normal startups and 3 natural circulation startups. The 120 shutdowns consist of 111 normal shutdowns, 8 single safety or relief valve blowdowns, and 1 rapid depressurization with delayed trip.

Table 4.3-2
Actual Cycles and Projected Cycles

Conditions	Analyzed cycles	Actual cycles 12/13/1984 through 2/16/2010	60 year (12/13/2044) projection(1)	Cycles for future analyses
Boltup/Unbolt	123	23	54	60
Reactor Startup (100 degF/hr)	120	94	224	250
Reactor Shutdown (100 degF/hr)	111	93	221	250
Vessel Pressure Tests	130	23	54	65
Loss of Feedwater Heaters	80	0	0	80
Scram – Loss of feedwater pumps, isolation valves closed	10	7	16	20
Scram – Single safety relief valve blowdown	8	1	2	8
Scram – TG trip, FW on, isolation valves open	40	23	54	60
Scram – HPCS Injection	30	12	28	60(2)
Scram – Other	140	39	92	90
LPCS operation	10	0	0	10
HPCS operation	10	3	7	10(2)
LPCI operation	10	0	0	10
SLC operation	10	0	0	10

(1) Projections were not changed for those events that have not occurred.
(2) Total HPCS injection cycles from scrams (60) and non-scrams (10) should not exceed 70.

A.1.2.4 Bolting Integrity Program

The Bolting Integrity Program is a combination of existing activities that, in conjunction with other credited programs, address the management of aging for the bolting of mechanical components and structural connections within the scope of license renewal. The Bolting Integrity Program relies on manufacturer and vendor information and industry recommendations for the proper selection, assembly, and maintenance of bolting for pressure-retaining closures and structural connections. The Bolting Integrity Program includes, through the Inservice Inspection (ISI) Program, Inservice Inspection (ISI) Program – IWF, Structures Monitoring Program, and External Surfaces Monitoring Program, the periodic inspection of bolting for indications of degradation such as leakage, loss of material due to corrosion, loss of pre-load, and cracking due to stress corrosion cracking (SCC) and fatigue.

Replace deleted text with Insert A on page A-9a

A.1.2.5 Buried Piping and Tanks Inspection Program

~~The Buried Piping and Tanks Inspection Program manages the effects of loss of material due to corrosion on the external surfaces of piping and tanks exposed to a buried environment.~~ The Buried Piping and Tanks Inspection Program is a combination of a mitigation program (consisting of protective coatings) and a condition monitoring program (consisting of visual inspections).

An inspection of buried piping will be performed within the 10-year period prior to entering the period of extended operation. An additional inspection of buried piping will be performed within 10 years after entering the period of extended operation.

The Buried Piping and Tanks Inspection Program is an existing program that requires enhancement prior to the period of extended operation.

A.1.2.6 BWR Feedwater Nozzle Program

The BWR Feedwater Nozzle Program is an existing program that manages cracking due to stress corrosion cracking and intergranular attack (SCC/IGA) and flaw growth of the feedwater nozzles. The BWR Feedwater Nozzle Program is in accordance with ASME Section XI and NRC augmented requirements.

The BWR Feedwater Nozzle Program consists of: (a) enhanced inservice inspection in accordance with the requirements of the ASME Boiler and Pressure Vessel Code, Section XI, Subsection IWB, Table IWB 2500-1 (2001 edition including the 2002 and 2003 Addenda) and the recommendations of General Electric report NE-523-A71-0594-A [Reference A.1.4-1], and (b) system modifications, as described in FSAR Section 5.3.3.1.4.5, to mitigate cracking. The program specifies periodic ultrasonic inspection of critical regions of the feedwater nozzles.

Insert A to LRA Section A.1.2.5

The Buried Piping and Tanks Inspection Program manages the effects of loss of material due to corrosion on the external surfaces of piping, piping components and tanks exposed to a buried environment. The program also manages the effects of cracking, loss of material and loss of pre-load for bolting exposed to a buried environment.

A.1.2.15 CRDRL Nozzle Program

The CRDRL Nozzle Program is an existing mitigation and condition monitoring program that manages cracking due to flaw growth of the control rod drive return line (CRDRL) nozzle, safe end, cap, and connecting welds. The CRDRL Nozzle Program consists of a) mitigation activities, and b) inspection, flaw evaluation, and repair in accordance with the ASME Boiler and Pressure Vessel Code, Section XI, Subsection IWB, Table IWB 2500-1 (2001 Edition through 2003 Addenda) and the recommendations of NUREG-0619. System modifications were implemented by the original equipment manufacturer prior to initial startup to mitigate cracking. The BWR Water Chemistry Program monitors and controls reactor coolant water chemistry in accordance with BWRVIP guidelines to ensure the long-term integrity and safe operation of the critical regions of the CRDRL nozzle.

The CRDRL Nozzle Program credits portions of the Inservice Inspection (ISI) Program.

A.1.2.16 Diesel Starting Air Inspection

The Diesel Starting Air Inspection detects and characterizes the condition of materials for the DSA System air dryers and downstream piping and components (excluding the DSA System air receivers). The inspection provides direct evidence as to whether, and to what extent, a loss of material due to corrosion has occurred.

The Diesel Starting Air Inspection is a new one-time inspection that will be implemented prior to the period of extended operation. The inspection activities will be conducted within the 10-year period prior to the period of extended operation.

A.1.2.17 Diesel Systems Inspection

The Diesel Systems Inspection detects and characterizes the condition of materials for the interior of the exhaust piping for the Division 1, 2, and 3 diesels in the Diesel Engine Exhaust System, including the loop seal drains from the exhaust piping~~, and the drain pans and drain piping associated with air-handling units of the Diesel Building HVAC systems~~. The inspection provides direct evidence as to whether, and to what extent, a loss of material due to corrosion has occurred.

The Diesel Systems Inspection is a new one-time inspection that will be implemented prior to the period of extended operation. The inspection activities will be conducted within the 10-year period prior to the period of extended operation.

A.1.2.18 Diesel-Driven Fire Pumps Inspection

The Diesel-Driven Fire Pumps Inspection detects and characterizes the material condition of the interior of the Fire Protection System diesel engine exhaust piping, and of Fire Protection System diesel heat exchangers exposed to a raw water environment.

A.1.2.37 Lubricating Oil Inspection

The Lubricating Oil Inspection detects and characterizes the condition of materials in systems and components for which the Lubricating Oil Analysis Program is credited with aging management. The inspection provides direct evidence as to whether, and to what extent, a loss of material due to corrosion or selective leaching has occurred. The inspection also determines whether a reduction in heat transfer due to fouling has occurred.

The Lubricating Oil Inspection is a new one-time inspection that will be implemented prior to the period of extended operation. The inspection activities will be conducted within the 10-year period prior to the period of extended operation.

A.1.2.38 Masonry Wall Inspection

The Masonry Wall Inspection consists of inspection activities to detect cracking of masonry walls within the scope of license renewal. Masonry walls that perform a fire barrier intended function are also managed by the Fire Protection Program. The Masonry Wall Inspection is implemented as part of the Structures Monitoring Program. The Masonry Wall Inspection performs visual inspection of external surfaces of masonry walls.

The Masonry Wall Inspection is an existing program that requires enhancement prior to the period of extended operation.

A.1.2.39 Material Handling System Inspection Program

The Material Handling System Inspection Program manages loss of material for cranes (including bridge, trolley, rails, and girders), monorails, and hoists within the scope of license renewal. The Material Handling System Inspection Program is based on guidance contained in ANSI B30.2 for overhead and gantry cranes, ANSI B30.11 for monorail systems and underhung cranes, and ANSI B30.16 for overhead hoists.

~~The Material Handling System Inspection Program is an existing program that requires enhancement prior to the period of extended operation.~~

A.1.2.40 Metal-Enclosed Bus Program

The Metal-Enclosed Bus Program is an inspection program that detects degradation of metal-enclosed bus within the scope of license renewal. The program provides for the visual inspection of interior sections of bus, and an inspection of the elastomeric seals at the joints of the duct sections. The program also makes provision for thermographic inspection of bus bolted connections.

The Metal-Enclosed Bus Program is a new aging management program that will be implemented prior to the period of extended operation. The thermography portion of the program will be performed once every 10 years, with the initial inspections to be performed prior to the period of extended operation. The visual inspection portion of the program will also be performed once every 10 years, with the first inspections to be performed prior to the period of extended operation.

A.1.2.41 Monitoring and Collection Systems Inspection

The Monitoring and Collection Systems Inspection detects and characterizes the condition of materials at the internal surfaces of subject mechanical components that are exposed to equipment or area drainage water and other potential contaminants and fluids. The inspection provides direct evidence as to whether, and to what extent, a loss of material due to corrosion or erosion has occurred. The inspection also determines whether cracking due to SCC of susceptible materials has occurred.

The Monitoring and Collection Systems Inspection is a new one-time inspection that will be implemented prior to the period of extended operation. The inspection activities will be conducted within the 10-year period prior to the period of extended operation.

A.1.2.42 Open-Cycle Cooling Water Program

The Open-Cycle Cooling Water Program manages ~~cracking due to SCC of susceptible materials and~~ loss of material due to corrosion and erosion for components located in the Standby Service Water and Plant Service Water systems, and for components connected to or serviced by those systems. The program manages fouling due to particulates (e.g., corrosion products) and biological material (micro- or macro-organisms) resulting in reduction in heat transfer for heat exchangers (including condensers, coolers, cooling coils, and evaporators) within the scope of the program. The Open-Cycle Cooling Water Program also manages loss of material for components associated with the feed-and-bleed mode for emergency makeup water to the spray pond.

The Open-Cycle Cooling Water Program consists of inspections, surveillances, and testing to detect the presence, and assess the extent of ~~cracking, fouling,~~ and loss of material. The inspection activities are combined with chemical treatments and cleaning activities to minimize the effects of aging. The program is a combination condition monitoring and mitigation program that implements the recommendations of NRC Generic Letter 89-13 for safety-related equipment in the scope of the program. The scope of the program also includes non-safety related components containing either service water or spray pond makeup water.

Insert: "fouling"

The Open-Cycle Cooling Water Program is an existing program that requires enhancement prior to the period of extended operation.

Table A-1
Columbia License Renewal Commitments

Item Number	Commitment	FSAR Supplement Location (LRA App. A)	Enhancement or Implementation Schedule
5) Buried Piping and Tanks Inspection Program	The Buried Piping and Tanks Inspection Program is an existing program that will be continued for the period of extended operation, with the following enhancements: • Revise the site program document to include the buried portions of the Radwaste Building Outside Air (WOA) piping. Add Insert A from page A-43a • Require that an inspection of a representative sample of buried piping be performed within the 10-year period prior to entering the period of extended operation (i.e., between year 30 and year 40). • Require an additional inspection of a representative sample of buried piping be performed within 10 years after entering the period of extended operation (i.e., between year 40 and year 50).	A.1.2.5	Enhancement prior to the period of extended operation. Then ongoing.
6) BWR Feedwater Nozzle Program	The BWR Feedwater Nozzle Program is an existing program that will be continued for the period of extended operation.	A.1.2.6	Ongoing
7) BWR Penetrations Program	The BWR Penetrations Program is an existing program that will be continued for the period of extended operation.	A.1.2.7	Ongoing
8) BWR Stress Corrosion Cracking Program	The BWR Stress Corrosion Cracking Program is an existing program that will be continued for the period of extended operation.	A.1.2.8	Ongoing

Amendment 1

Insert A to LRA Table A-1 Item Number 5

- Revise the site program document to include cracking, loss of material and loss of pre-load of bolting as aging effects managed by the program.
- Revise the site program document to include loss of material of stainless steel piping and piping components as an aging effect managed by the program.

Table A-1
Columbia License Renewal Commitments

Item Number	Commitment	FSAR Supplement Location (LRA App. A)	Enhancement or Implementation Schedule
16) Diesel Starting Air Inspection	The Diesel Starting Air Inspection is a new activity. The Diesel Starting Air Inspection detects and characterizes the condition of materials for the DSA System air dryers and downstream piping and components (excluding the DSA System air receivers). The inspection provides direct evidence as to whether, and to what extent, the relevant effects of aging have occurred.	A.1.2.16	Within the 10-year period prior to the period of extended operation.
17) Diesel Systems Inspection	The Diesel Systems Inspection is a new activity. The Diesel Systems Inspection detects and characterizes the condition of materials for the interior of the exhaust piping for the Division 1, 2, and 3 diesels in the Diesel Engine Exhaust System, including the loop seal drains from the exhaust piping~~, and the drain pans and drain piping associated with air-handling units of the Diesel Building HVAC systems~~. The inspection provides direct evidence as to whether, and to what extent, the relevant effects of aging have occurred.	A.1.2.17	Within the 10-year period prior to the period of extended operation.
18) Diesel-Driven Fire Pumps Inspection	The Diesel-Driven Fire Pumps Inspection is a new activity. The Diesel-Driven Fire Pumps Inspection detects and characterizes the material condition of the interior of the Fire Protection System diesel engine exhaust piping, and of Fire Protection System diesel heat exchangers exposed to a raw water environment. The inspection provides direct evidence as to whether, and to what extent, the relevant effects of aging have occurred.	A.1.2.18	Within the 10-year period prior to the period of extended operation.

Table A-1
Columbia License Renewal Commitments

Item Number	Commitment	FSAR Supplement Location (LRA App. A)	Enhancement or Implementation Schedule
23) External Surfaces Monitoring Program	The External Surfaces Monitoring Program is an existing program that will be continued for the period of extended operation, with the following enhancements: • Add aluminum, copper alloy, copper alloy >15 % Zn, gray cast iron, stainless steel (including CASS), and elastomers to the scope of the program. • Add cracking as an aging effect for aluminum ~~and stainless steel~~ components. • Add visual (VT-1 or equivalent) or volumetric examination techniques to detect cracking. • Add hardening and loss of strength as aging effects for elastomer-based mechanical sealants and flexible connections in HVAC systems. • Add physical examination techniques in addition to visual inspection to detect hardening and loss of strength for elastomer-based mechanical sealants and flexible connections in HVAC systems.	A.1.2.23	Enhancement prior to the period of extended operation. Then ongoing.
24) Fatigue Monitoring Program	The Fatigue Monitoring Program is an existing program that will be continued for the period of extended operation, with the following enhancements:	A.1.2.24 A.1.3.2 A.1.3.4	Enhancement prior to the period of extended operation. Then ongoing.

Amendment 1

Table A-1
Columbia License Renewal Commitments

Item Number	Commitment	FSAR Supplement Location (LRA App. A)	Enhancement or Implementation Schedule
38) Masonry Wall Inspection	The Masonry Wall Inspection is an existing program that will be continued for the period of extended operation, with the following enhancements: • Specify that for each masonry wall, the extent of observed masonry cracking or degradation of steel edge supports and bracing are evaluated to ensure that the current evaluation basis is still valid. Corrective action is required if the extent of masonry cracking or steel degradation is sufficient to invalidate the evaluation basis. An option is to develop a new evaluation basis that accounts for the degraded condition of the wall (i.e., acceptance by further evaluation).	A.1.2.38	Enhancement prior to the period of extended operation. Then ~~going~~. ongoing
39) Material Handling System Inspection Program	The Material Handling System Inspection Program is an existing program that will be continued for the period of extended operation, ~~with the following enhancement:~~ ~~• Ensure jib cranes and electrically operated hoists are visually inspected for corrosion~~.	A.1.2.39	~~Enhancement prior to the period of extended operation~~. ~~Then~~ ongoing.

Amendment 1

Table B-2
Consistency of Columbia Aging Management Programs with NUREG-1801 (continued)

Program Name	New / Existing	Consistent with NUREG-1801	Consistent with NUREG-1801 with Exceptions	Plant-Specific	Enhancement Required
Inservice Inspection (ISI) Program – IWF Section B.2.35	Existing	Yes	--	--	--
Lubricating Oil Analysis Program Section B.2.36	Existing	Yes	--	--	Yes
Lubricating Oil Inspection Section B.2.37	New	Yes	--	--	--
Masonry Wall Inspection Section B.2.38	Existing	Yes	--	--	Yes
Material Handling System Inspection Program Section B.2.39	Existing	Yes	--	--	~~Yes~~
Metal-Enclosed Bus Program Section B.2.40	New	--	Yes	--	--
Monitoring and Collection Systems Inspection Section B.2.41	New	Yes	--	--	--
Open-Cycle Cooling Water Program Section B.2.42	Existing	--	Yes	--	Yes
Potable Water Monitoring Program Section B.2.43	Existing	--	--	Yes	Yes

Amendment 1

Type B and C leakage rate test results from the 2007 Refueling Outage (R18) are summarized in the local leak rate test post outage report. The R18 local leak rate test involved ninety-one Type B and C air tests. Twenty-five Type B tests were conducted, including the personnel airlock barrel test. All Type B as found leak rates were below their administrative limits with the exception of the containment-side flange (CEP-V-2A), which had a leak rate exceeding its administrative limit. This flange was checked using a soap solution with test pressure applied and showed no external leakage. This visual inspection confirmed that the leakage recorded was into the system rather than a breach of the containment penetration. Sixty-six Type C tests were conducted. All but eight valves had as found leak rates below their administrative limits. The valves with leak rates in excess of their administrative limit required corrective actions to reduce their leak rates. Of the eight valves with as found leak rates in excess of their administrative limits, five required disassembly and rework, and one valve was replaced. The remaining two valves were successfully flushed and as-left tested without disassembly.

The total as found leakage at the beginning of Refueling Outage 19 (R19) was 19,712 standard cubic centimeters per minute (sccm). This equates to 16.2 percent of the total allowable containment leakage (La) of 121,536 sccm. The values from previous refueling outages (R18) and (R17) were 13,683 sccm and 20,879 sccm respectively.

The total as left leakage at the end of R19 was 13,098 sccm. This equates to 10.8 percent of the total allowable containment leakage (La) of 121,536 sccm and well below the maximum allowable startup containment leakage rate of 0.6La. The values from the previous refueling outages (R18) and (R17) were 14,051 sccm and 17,423 sccm, respectively.

The results of previous Type A tests are shown below. No Type A tests have failed to meet their acceptance criteria at Columbia.

Test Date	Total Leakage (percent)	Acceptance Limit (percent)
02/16/1984	0.2758	0.50
06/17/1987	0.3241	0.50
06/09/1991	0.319	0.50
07/20/1994	0.330	0.50
06/14/2009	0.3418	0.50

The health of the Appendix J Program is reported periodically in terms of performance indicators. The program health reports for 2007 ~~and 2008~~ indicated no age-related concerns for systems and components within the scope of the Appendix J Program.

to 2009

Amendment 1

B.2.5 Buried Piping and Tanks Inspection Program

Program Description

~~The Buried Piping and Tanks Inspection Program will manage the effects of loss of material due to corrosion on the external surfaces of piping and tanks exposed to a buried environment.~~ Replace with Insert A on page B-39a

The Buried Piping and Tanks Inspection Program is a combination of a mitigation program (consisting of protective coatings) and a condition monitoring program (consisting of visual inspections). Integrity of coatings will be inspected when components are excavated for maintenance or other reasons. If an opportunistic inspection has not occurred between year 30 and year 38, an excavation of a section of buried piping for the purpose of inspection will be performed before year 40. An additional inspection of buried piping will be performed within 10 years after entering the period of extended operation.

The Buried Piping and Tanks Inspection Program will continue to ensure that the pressure boundary integrity of the subject components is maintained consistent with the current licensing basis during the period of extended operation.

NUREG-1801 Consistency

The Buried Piping and Tanks Inspection Program is an existing Columbia program that, with enhancement, will be consistent with the 10 elements of an effective aging management program as described in NUREG-1801, Section XI.M34, "Buried Piping and Tanks Inspection."

Exceptions to NUREG-1801

None.

Required Enhancements

Prior to the period of extended operation the enhancements listed below will be implemented in the identified program element:

- **Scope of Program –**

  Revise the site program document to include the buried portions of the Radwaste Building Outside Air (WOA) piping.

Add Insert B on page B-39a

Insert A to LRA Section B.2.5, page B-39

The Buried Piping and Tanks Inspection Program will manage the effects of loss of material due to corrosion on the external surfaces of piping, piping components and tanks exposed to a buried environment. The program also manages cracking, loss of material and loss of pre-load for bolting exposed to a buried environment.

Insert B to LRA Section B.2.5, page B-39

Revise the site program document to include cracking, loss of material and loss of pre-load of bolting as aging effects managed by the program.

Revise the site program document to include loss of material of stainless steel piping and piping components as an aging effect managed by the program.

- **Detection of Aging Effects –**

  Require that an inspection of a representative sample of buried piping be performed within the 10-year period prior to entering the period of extended operation (i.e., between year 30 and year 40).

  Require an additional inspection of a representative sample of buried piping be performed within 10 years after entering the period of extended operation (i.e., between year 40 and year 50).

Operating Experience

No history of piping degradation due to external corrosion of buried piping was identified for Columbia through searches of operating experience or discussions with program owners. Columbia operating experience demonstrates that the coating of buried steel piping and tanks is effective in managing the effects of aging. Plant design considerations addressed the potential for degradation of buried piping components through the application of protective coatings.

A review was conducted of station piping failures, and it was determined that there had been no documented failures attributed to externally-initiated corrosion. Identified instances of leakage associated with buried piping have been the result of internal corrosion.

The environmental conditions at Columbia are very good based on the sandy soil and electrolyte resistivity of the soil which is considered very high. This has resulted in minimal degradation of buried piping as evidenced by excavations of certain sections of piping for examination. There have been no significant areas of degradation caused by protective coating failure. This was determined after a section of buried Standby Service Water (SW) System piping was excavated and evaluated in 2007.

Conclusion

Replace with Insert A on Page B-40a

~~The Buried Piping and Tanks Inspection Program will manage loss of material due to corrosion for susceptible piping components and tanks in buried environments.~~ The Buried Piping and Tanks Inspection Program, with the required enhancements, provides reasonable assurance that the aging effects will be managed such that components subject to aging management review will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

Insert A to LRA Section B.2.5, page B-40

The Buried Piping and Tanks Inspection Program will manage cracking and loss of pre-load of bolting and loss of material due to corrosion for susceptible bolting, piping, piping components and tanks in buried environments.

experience (e.g., time in-service, most susceptible locations, lowest design margins). Inspection findings that do not meet the acceptance criteria will be evaluated using the Columbia corrective action process to determine the need for subsequent aging management activities and for monitoring and trending of the results.

- Acceptance Criteria
  Indications or relevant conditions of degradation detected during the inspections will be compared to pre-determined acceptance criteria. If the acceptance criteria are not met, then the indications and conditions will be evaluated under the corrective action program to determine whether they could result in a loss of component intended function during the period of extended operation.

- Corrective Actions
  This element is common to Columbia programs and activities that are credited with aging management during the period of extended operation and is discussed in Section B.1.3.

- Confirmation Process
  This element is common to Columbia programs and activities that are credited with aging management during the period of extended operation and is discussed in Section B.1.3.

- Administrative Controls
  This element is common to Columbia programs and activities that are credited with aging management during the period of extended operation and is discussed in Section B.1.3.

- Operating Experience
  The Cooling Units Inspection is a new one-time inspection activity for which plant operating experience has not shown the occurrence of the aforementioned aging effects. The inspection provides for confirmation of material conditions near the period of extended operation. The elements comprising the inspection activity are to be consistent with industry practice.

  NUREG-1801 is based on industry operating experience through January 2005. Recent industry operating experience has been reviewed for applicability; none was identified. Future operating experience is captured through the normal operating experience review process, which will continue through the period of extended operation.

  A review of Columbia operating experience, documented in recent work orders, revealed that cooling unit coils have been found clean and no leakage was observed.

Add Insert A from Page B-68a

Insert A to LRA Section B.2.14, page B-68

In addition, water was found to be dripping from duct downstream of Control Room Division 1 air handling unit WMA-AH-51A in June of 2009. This was determined to be from condensation that collected in a depression in the bottom of the air handling unit housing. Water was removed from the bottom of the housing and similar air handling units were inspected and confirmed to be self-draining properly. No corrosion of the air unit housing was identified during the removal and inspection.

B.2.17 Diesel Systems Inspection

Program Description

The Diesel Systems Inspection is a new one-time inspection that will detect and characterize the material condition of the interior of the exhaust piping for the Division 1, 2, and 3 diesels in the Diesel Engine Exhaust System, including the loop seal drains from the exhaust piping~~, and the drain pans and drain piping associated with air-handling units of the Diesel Building HVAC systems~~. The inspection provides direct evidence as to whether, and to what extent, a loss of material due to corrosion has occurred or is likely to occur.

Implementation of the Diesel Systems Inspection will provide confirmation that the integrity of the subject components will be maintained consistent with the current licensing basis during the period of extended operation.

NUREG-1801 Consistency

The Diesel Systems Inspection is a new one-time inspection for Columbia that will be consistent with the 10 elements of an effective aging management program as described in NUREG-1801, Section XI.M32, "One-Time Inspection."

Exceptions to NUREG-1801

None.

Aging Management Program Elements

The results of an evaluation of each program element are provided below.

- Scope of Program
  The scope of the Diesel Systems Inspection includes the steel exhaust piping exposed to an air-outdoor environment, and the loop seal drains from the exhaust piping that are exposed to a raw water environment, for the following diesel engines:
  - DG-ENG-1A1/1A2
  - DG-ENG-1B1/1B2
  - DG-ENG-1C
  - DSA-ENG-C/2C

  ~~Additionally the stainless steel drain pans and steel drain piping exposed to a raw water environment and associated with the following equipment are in the scope of the Diesel Systems Inspection:~~

- ~~DMA-AH-11, 12, 21, 22, 31, 32, and 51 (air-handling unit housings)~~

- Preventive Actions
  No actions are taken as part of the Diesel Systems Inspection to prevent aging effects or to mitigate aging degradation.

- Parameters Monitored or Inspected
  The parameters to be inspected by the Diesel Systems Inspection include wall thickness or visual evidence of internal surface degradation~~,~~ of the diesel exhaust piping ~~and the drain pans and drain piping~~ as measures of loss of material. Inspections will be performed by qualified personnel using established NDE techniques (i.e., ultrasonic examination). Visual inspection of the internals for evidence of corrosion and corrosion products may be performed as opportunities for access arise.

- Detection of Aging Effects
  The Diesel Systems Inspection will use a combination of established volumetric and visual examination techniques (such as equivalent to VT-1 or VT-3) performed by qualified personnel on a representative sample of the subject components to identify evidence of loss of material.

  The sample population will be determined by engineering evaluation based on sound statistical sampling methodology, and, where practical, will be focused on the components most susceptible to aging, such as due to their time in service, the severity of conditions during normal plant operations, and design margins.

  The Diesel Systems Inspection will be conducted after the issuance of the renewed license and prior to the end of the current operating license, with sufficient time to implement programmatic oversight for the period of extended operation. The activities will be conducted no earlier than 10 years prior to the end of the current operating license, so that conditions are more representative of the conditions expected during the period of extended operation.

- Monitoring and Trending
  This one-time inspection activity is used to characterize conditions and to determine if, and to what extent, further actions may be required. The activity includes provisions for increasing the inspection sample size and locations if degradation is detected.

  The sample size will be determined by engineering evaluation of the materials of construction, the environment (i.e., service conditions), aging effects, and operating experience (e.g., time in-service, susceptible locations, lowest design margins). Inspection findings that do not meet the acceptance criteria will be evaluated using

B.2.23 External Surfaces Monitoring Program

Program Description

The External Surfaces Monitoring Program will manage the following aging effects for the external surfaces, and in some cases the internal surfaces, of mechanical components within the scope of license renewal:

- Loss of material for metals (aluminum, copper alloy, copper alloy > 15% Zn, gray cast iron, stainless steel (including CASS), and steel) that are exposed to condensation, air-indoor uncontrolled, and air-outdoor environments
- Cracking of aluminum ~~and stainless steel~~ exposed to condensation environments
- Hardening and loss of strength for elastomer-based mechanical sealants and flexible connections in HVAC systems

The External Surfaces Monitoring Program is a condition monitoring program that consists of visual inspections and surveillance activities of accessible external surfaces on a frequency that generally exceeds once per fuel cycle. Surfaces that are inaccessible during normal plant operation are inspected during refueling outages. Surfaces that are inaccessible or not readily visible during both plant operations and refueling outages, such as surfaces that are insulated, are inspected opportunistically, for example during maintenance activities during which insulation is removed.

The External Surfaces Monitoring Program is supplemented by the Aboveground Steel Tanks Inspection to manage loss of material for the inaccessible external surfaces of the carbon steel condensate storage tanks (i.e., the tank bottom).

NUREG-1801 Consistency

The External Surfaces Monitoring Program is an existing Columbia program that, with enhancement, will be consistent with the 10 elements of an effective aging management program as described in NUREG-1801, Section XI.M36, "External Surfaces Monitoring."

Exceptions to NUREG-1801

None.

Required Enhancements

Prior to the period of extended operation the enhancements listed below will be implemented in the identified program element:

- **Scope of Program –**
  - Add aluminum, copper alloy, copper alloy >15% Zn, gray cast iron, stainless steel (including CASS), and elastomers to the scope of the program.
  - Add cracking as an aging effect for aluminum ~~and stainless steel~~ components.
  - Add hardening and loss of strength as aging effects for elastomer-based mechanical sealants and flexible connections in HVAC systems.
- **Monitoring and Trending –**
  - Add physical examination techniques in addition to visual inspection to detect hardening and loss of strength for elastomer-based mechanical sealants and flexible connections in HVAC systems.
  - Add visual (VT-1 or equivalent) or volumetric examination techniques to detect cracking.

Operating Experience

The elements that comprise the External Surfaces Monitoring Program are consistent with industry practice and have proven effective in maintaining the material condition of Columbia plant systems and components.

A review of the most recent plant-specific operating experience, through a search of condition reports, revealed that minor component leakage (typically at bolted joints and closures), damage (event-driven, not age-related), and degradation are routinely identified by the External Surfaces Monitoring Program, with subsequent corrective actions taken in a timely manner; and that no loss of pressure boundary integrity has occurred that was, or could have been, attributed to the aging effects that are in the scope of the program.

Operating experience associated with the External Surfaces Monitoring Program is routinely documented and communicated to site personnel in System Health Reports. System Health Reports are updated after significant changes, or at least quarterly.

Conclusion

The External Surfaces Monitoring Program will detect and manage loss of material for aluminum, copper alloy, copper alloy >15% Zn, gray cast iron, stainless steel (including CASS), and steel components. The continued implementation of the External Surfaces Monitoring Program, with the required enhancements, provides reasonable assurance that the effects of aging, including cracking for aluminum ~~and stainless steel~~ components and hardening and loss of strength for elastomer-based mechanical sealants and flexible connections in HVAC systems, will be managed such that components subject to aging management will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

periodically reported, including material conditions. Industry operating experience has been, and continues to be, evaluated for impact to Columbia and for possible program enhancement. For example, based on review of INPO operating experience 14865, the program was enhanced to require evaluation of replacements for future inspection.

Periodic self assessments are also conducted. Gaps identified during the most recent self assessment have all been closed; and the FAC program plan was ~~recently~~ updated, with the ~~current~~ revision addressing all issues identified by the self assessment. In the last benchmark assessment, performed in March 2007, no issues or weaknesses were identified.

As a result, Columbia has programs and procedures in place, with operating experience demonstrating that the FAC Program is capable of detecting and managing loss of material due to FAC for susceptible components, and will continue to be an effective aging management program for the period of extended operation.

A review of program health reports, recent self-assessment reports, and related condition reports, demonstrates that the FAC Program is effective in detecting loss of material due to FAC for susceptible components, and defining the corrective actions (e.g., repair or replacement) necessary to assure their continued operation in accordance with design requirements.

Conclusion

The FAC Program will detect and manage loss of material due to FAC for susceptible components. The FAC Program, with the required enhancements, provides reasonable assurance that the aging effects will be managed such that components subject to aging management review will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

contain fuel oil. Quarterly sampling of the fuel oil tanks for the diesel-driven fire pumps has been effective at identifying unacceptable levels of water and sediment prior to a loss of function. Higher than expected amounts of water or sediment during periodic sampling has resulted in cleaning of the tanks and filtering of the fuel to restore acceptable conditions. The periodic cleaning and filtering has included the addition of a biocide due to evidence of biofouling.

To meet new Environmental Protection Agency requirements, Columbia will be transitioning to Ultra-Low-Sulfur Diesel (ULSD) fuel prior to the period of extended operation. ULSD fuel and its possible adverse impacts on diesel performance are addressed in NRC Information Notice 2006-022. The impact of using ULSD fuel on the Columbia design and licensing basis has been evaluated, including the consideration of related operating experience from the industry, and corrective actions assigned to account for the future transition. ~~Columbia will provide notification of any changes to the Fuel Oil Chemistry Program as a result of the transition to ULSD fuel.~~

Replace with Insert A below

Conclusion

The Fuel Oil Chemistry Program will manage loss of material and cracking for susceptible components through monitoring and control of contaminants in the fuel oil. The Fuel Oil Chemistry Program provides reasonable assurance that the aging effects will be managed such that components subject to aging management review will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

Insert A:
Energy Northwest determined that there are no compatibility issues and that no corrective actions or modifications are necessary as a result of the transition to ULSD fuel.

B.2.39 Material Handling System Inspection Program

Program Description

The Material Handling System Inspection Program is credited with managing loss of material for cranes (including bridge, trolley, rails, and girders), monorails, and hoists within the scope of license renewal. The Material Handling System Inspection Program is based on guidance contained in ANSI B30.2 for overhead and gantry cranes, ANSI B30.11 for monorail systems and underhung cranes, and ANSI B30.16 for overhead hoists. The inspections monitor structural members for signs of corrosion and wear. The inspections are performed periodically for installed cranes and hoists (e.g., annually for the reactor building crane, other NUREG-0612 heavy load handling systems and the refueling platform).

The Material Handling System Inspection Program provides reasonable assurance that the effects of aging are adequately managed for Columbia cranes (including bridge, trolley, rails, and girders), monorails, and hoists and that their intended function will continue to be performed consistent with the current licensing basis for the period of extended operation.

NUREG-1801 Consistency

Replace stricken text with "is"

The Material Handling System Inspection Program is an existing Columbia program that~~, with enhancement, will be~~ consistent with the 10 elements of an effective aging management program as described in NUREG-1801, Section XI.M23, "Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems."

Exceptions to NUREG-1801

None.

Required Enhancements

Replace stricken text with "None."

~~Prior to the period of extended operation the enhancement listed below will be implemented in the identified program element:~~

- ~~**Detection of Aging Effects**~~

  ~~Ensure jib cranes and electrically operated hoists are visually inspected for corrosion.~~

Operating Experience

A review of crane and hoist inspections previously conducted at Columbia and of industry operating experience confirms the acceptability of the inspections and their

Amendment 1

frequency in that degradation of cranes (including bridge, trolley, rails, and girders), monorails, and hoists was detected prior to loss of function. Related crane and hoist inspections have found no age-related degradation problems.

The health of the Material Handling System Inspection Program is reported periodically in terms of performance indicators. The program health reports for 2007 ~~and 2008~~ noted no age-related improvements for the program.

The Material Handling System Inspection Program has been effective in managing the identified aging effects. The site corrective action program and ongoing review of industry operating experience will be used to ensure that the program continues to be effective in managing the identified aging effects.

replace with "to 2009"

Conclusion

The Material Handling System Inspection Program will be capable of detecting and managing loss of material for cranes (including bridge, trolley, rails, and girders), monorails, and hoists within the scope of license renewal. The continued implementation of the Material Handling System Inspection Program~~, with the required enhancement,~~ provides reasonable assurance that the aging effects will be managed such that components subject to aging management review will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

Amendment 1

- Confirmation Process
This element is common to Columbia programs and activities that are credited with aging management during the period of extended operation and is discussed in Section B.1.3.

- Administrative Controls
This element is common to Columbia programs and activities that are credited with aging management during the period of extended operation and is discussed in Section B.1.3.

- Operating Experience
The Metal-Enclosed Bus Program is a new program for which there is no direct site-specific operating experience. Based on review of plant-specific and industry operating experience, the identified aging effects require management for the period of extended operation.

  Plant operating experience has shown that the corrective action program has addressed issues related to bus and bus enclosure degradation in recent years. For example, corrosion was identified on insulators used to support bus associated with the unit normal auxiliary transformer (which is not in scope for license renewal). In addition, the corrective action program noted that the use of thermography would provide an improvement to the bus preventive maintenance program. Industry operating experience will be included in the development of this program.

Add Insert A shown below here

Required Enhancements

Not applicable, this is a new program.

Conclusion

The Metal-Enclosed Bus Program will manage aging degradation for metal-enclosed bus. The Metal-Enclosed Bus Program will provide reasonable assurance that the aging effects will be managed such that metal-enclosed bus subject to aging management review will continue to perform its intended functions consistent with the current licensing basis for the period of extended operation.

Insert A:
Also, in August 2009, there was a failure of a 6.9 kV non-segregated metal-enclosed bus (this bus not in the license renewal scope). The corrective action program is addressing the cause and actions needed to prevent reoccurrence on plant metal-enclosed busses.

- Floor Drains Radioactive (FDR) System
- Fuel Pool Cooling (FPC) System
- Miscellaneous Waste Radioactive (MWR) System
- Plant Sanitary Drains (PSD) System
- Process Sampling Radioactive (PSR) System
- Reactor Closed Cooling (RCC) Water System

Add:
Process Sampling
(PS) System

A representative sample of components in these systems, to be defined in the implementing documents, and to include containment isolation piping and valve bodies, will be examined for evidence of a loss of material (due to crevice, galvanic, general, or pitting corrosion, erosion, or MIC), or to confirm a lack thereof, and the results applied to all of the systems and components within the scope of the inspection, based on engineering evaluation. ~~In addition, the representative sample will include stainless steel components exposed to temperatures greater than 140 ºF that will be examined for evidence of cracking due to SCC.~~

Replace with Insert A
on page B-160a

- Preventive Actions
  No actions are taken as part of the Monitoring and Collection Systems Inspection to prevent aging effects or to mitigate aging degradation.

- Parameters Monitored or Inspected
  The parameters to be inspected by the Monitoring and Collection Systems Inspection include wall thickness or visual evidence of internal surface degradation, as measures of a loss of material or cracking in susceptible materials. Inspections will be performed by qualified personnel using established NDE techniques.

- Detection of Aging Effects
  The Monitoring and Collection Systems Inspection will use a combination of established volumetric and visual examination techniques (such as equivalent to VT-1 or VT-3) performed by qualified personnel on a sample population of subject components to identify evidence of loss of material or cracking in susceptible materials or to confirm a lack thereof on the susceptible internal surfaces of the components.

  The sample population will be determined by engineering evaluation based on sound statistical sampling methodology, and, where practical, will be focused on the components most susceptible to aging, such as due to their time in service, the severity of conditions during normal plant operations, and the lowest design margins. The sample population will include at least one location for containment isolation components.

Insert A to Page B-160

In addition, the representative sample will include stainless steel components exposed to temperatures greater than 140 °F and copper alloy> 15% Zn components exposed to raw water that will be examined for evidence of cracking due to SCC.

B.2.42 Open-Cycle Cooling Water Program

Program Description

The Open-Cycle Cooling Water Program manages loss of material due to crevice, galvanic, general, pitting, and MIC, and erosion for components located in the Standby Service Water and Plant Service Water systems, and components connected to or serviced by those systems, and in the Tower Makeup Water and Circulating Water systems. The program also manages fouling due to particulates (e.g., corrosion products) and biological material (micro- and macro-organisms) resulting in reduction in heat transfer for heat exchangers within the scope of the program. ~~In addition, the program manages cracking for copper alloy > 15% Zn components in the Process Sampling System and for aluminum components in the HVAC systems that are subject to condensation.~~

Replace: "fouling and loss of material"

Add: "and"

The Open-Cycle Cooling Water Program consists of inspections, surveillances, and testing to detect the presence, and assess the extent, of ~~fouling, loss of material, and cracking~~, combined with chemical treatments and cleaning activities to minimize fouling, loss of material~~, and cracking~~. The existing program is a combination condition monitoring and mitigation program that implements the recommendations of NRC GL 89-13, "Service Water System Problems Affecting Safety-Related Equipment."

NUREG-1801 Consistency

The Open-Cycle Cooling Water Program is an existing Columbia program that, with enhancement, will be consistent with the 10 elements of an effective aging management program as described in NUREG-1801 Section XI.M20, "Open-Cycle Cooling Water System," with exceptions.

Exceptions to NUREG-1801

Program Elements Affected:

- **Preventive Actions –**

  NUREG-1801 states that system components are lined or coated to protect underlying metal surfaces from being exposed to aggressive cooling water environments. Protective coatings on the inner walls are not used in the service water systems that are within the scope of license renewal at Columbia.

- **Monitoring and Trending –**

  NUREG-1801 states that testing and inspections are performed annually and during refueling outages. Inspection frequencies for the Open-Cycle Cooling Water Program are based on operating conditions and past history; flow rates, water quality, lay-up, and heat exchanger design.

- Parameters Monitored or Inspected
  The Potable Water Monitoring Program monitors the water treatment plant performance and the overall status of the potable water system, including water quality.

- Detection of Aging Effects
  The Potable Water Monitoring Program will be enhanced to use a combination of established volumetric and visual examination techniques performed by qualified personnel on locations within the PWC, PWH, and ROA systems, as determined by engineering evaluation, to identify evidence of a loss of material, or to confirm a lack thereof. At least one inspection will be conducted within the 10-year period prior to the period of extended operation.

  Based on operating experience, it is necessary that inspections be conducted at least once every five years, and include components of the PWC and PWH systems that are located in the Reactor Building, and components associated with the ROA air washer (ROA-AW-1), including the air washer housing.

  Insert: "or Radwaste Building (including corridors)"

- Monitoring and Trending
  The Potable Water Monitoring Program monitors the water treatment plant performance and the overall status of the potable water system, including water quality, and the results are recorded and trended.

- Acceptance Criteria
  The acceptance criteria for potable water system inspections are: indications or relevant conditions of degradation detected during the inspection will be compared to pre-determined acceptance criteria. If the acceptance criteria are not met, then the indications and conditions will be evaluated under the corrective action program to determine whether they could result in a loss of component intended function during the period of extended operation.

  Acceptance criteria have been established for potable water quality, which minimizes the presence of impurities that could cause degradation.

- Corrective Actions
  This element is common to Columbia programs and activities that are credited with aging management during the period of extended operation and is discussed in Section B.1.3.

- Confirmation Process
  This element is common to Columbia programs and activities that are credited with aging management during the period of extended operation and is discussed in Section B.1.3.

inspection includes a visual examination and hardness measurement, or NRC approved alternative, of a sample set of components to determine whether selective leaching is occurring or is likely to occur in the period of extended operation.

The aging management activity is credited for the following systems:

- Auxiliary Steam (AS) System
- Circulating Water (CW) System
- Containment Nitrogen (CN) System
- Control Rod Drive (CRD) System
- Diesel Building HVAC Systems (DMA)
- Diesel Fuel Oil (DO) System
- Fire Protection (FP) System

Insert:
"Heating Steam (HS) System
Heating Steam Condensate (HCO) System"

- High Pressure Core Spray (HPCS) System
- Low Pressure Core Spray (LPCS) System
- Main Steam (MS) System
- Plant Service Water (TSW) System
- Potable Cold Water (PWC) System
- Potable Hot Water (PWH) System
- Process Sampling (PS) System
- Radwaste Building Chilled Water (WCH) System
- Radwaste Building HVAC Systems (WEA, WMA, WOA, WRA)
- Reactor Building HVAC Systems (REA, ROA, RRA)
- Residual Heat Removal (RHR) System
- Standby Service Water (SW) System
- Tower Makeup Water (TMU) System

- Preventive Actions
No actions are taken as part of the Selective Leaching Inspection to prevent aging effects or to mitigate aging degradation. Although the control of water chemistry may reduce selective leaching in treated water environments, no specific credit is taken for water chemistry control as part of this program.

of whether failures were maintenance preventable. A review of the Maintenance Rule program periodic assessments did not identify any age-related functional failures related to structures. Two non-age related functional failures identified were that the Reactor Building crane was parked without the tornado latches installed and a 10 CFR 21 notice from Whiting Crane Corporation regarding a weld defect on the Reactor Building crane main trolley.

Replace with "documented"

A ~~recent~~ condition report ~~documents~~ a surface flaw noted in the concrete of the west exterior wall of the Reactor Building. The surface flaw appears to have existed for a significant period of time with no apparent adverse effects on secondary containment or the Reactor Building structure. Add Insert A on page B-196a

NRC Unresolved Item (URI) 05000397/2007005-02 was issued in February of 2008. This URI identified that Columbia had not performed nor scheduled condition monitoring, inspection, or preventative maintenance (since receiving an operating license in 1983) of the submerged portion of the suppression chamber, the standby service water spray ponds, or the condensate storage tanks. The URI stated that although the licensee performed some monitoring of these structures, failure to perform monitoring of the submerged portion of these structures could result in undetected cracks or leakage that could prevent them from meeting their design basis functions. This URI was documented in a condition report ~~that is currently being~~ resolved under the corrective action process with closure information ~~expected near the time of the LRA submittal~~.

Replace with "reviewed and accepted by the NRC"

Replace with "and has been"

The Structures Monitoring Program provides reasonable assurance that aging effects are being managed. This has been demonstrated through inspection reports, program health reports, periodic assessments, and the corrective action program.

The site corrective action program and ongoing review of industry operating experience will be used to ensure that the program continues to be effective in managing the identified aging effects.

Conclusion

The Structures Monitoring Program, with enhancements, will be capable of detecting and managing aging effects for structures within the scope of license renewal. The continued implementation of the Structures Monitoring Program, with the required enhancements, provides reasonable assurance that the effects of aging will be managed so that components subject to aging management review will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

Insert A for LRA Section B.2.50, Page B-196

Investigation concluded that the crack has existed since construction and was repaired by grout material. A visual inspection of the cracked area determined additional sealing was required in order to prevent potential corrosion of reinforcing steel. The surface flaw crack has been partially sealed at the north end to close up the wider portion of the gap. The location of the surface flaw has been noted for re-inspection and future trending by the Structural Monitoring Program.

B.2.51 Supplemental Piping/Tank Inspection

Program Description

The Supplemental Piping/Tank Inspection is a new one-time inspection that will detect and characterize the material condition of steel, gray cast iron, and stainless steel components that are exposed to moist air environments, particularly the aggressive alternate wet and dry environment that exists at air-water interfaces or air spaces of susceptible piping and tanks. The inspection provides direct evidence as to whether, and to what extent, loss of material due to crevice, galvanic, general, and pitting corrosion, or MIC has occurred or is likely to occur that could result in a loss of intended function of the subject components.

Implementation of the Supplemental Piping/Tank Inspection will ensure that the pressure boundary integrity of susceptible safety-related components is maintained consistent with the current licensing bases during the period of extended operation. Implementation of the inspection will also ensure that the structural integrity of susceptible NSR components will be maintained such that spatial interactions (e.g., leakage) will not result in the loss of any safety-related component intended functions during the period of extended operation.

NUREG-1801 Consistency

The Supplemental Piping/Tank Inspection is a new one-time inspection for Columbia that will be consistent with the 10 elements of an effective aging management program as described in NUREG-1801, Section XI.M32, "One-Time Inspection."

Exceptions to NUREG-1801

None.

Aging Management Program Elements

The results of an evaluation of each program element are provided below.

- Scope of Program
  The scope of the Supplemental Piping/Tank Inspection includes the internal and external surfaces of steel, gray cast iron, and stainless steel components at air-water interfaces and other susceptible locations in the following systems:
    - Condensate (Nuclear) (COND) System
    - Containment Vacuum Breakers (CVB)
    - Diesel Cooling Water (DCW) System
    - Equipment Drains Radioactive (EDR) System

Add: "Condensate (Auxiliary) (CO) System"

- Fire Protection (FP) System
- Floor Drain (FD) System
- Floor Drain Radioactive (FDR) System
- Fuel Pool Cooling (FPC) System
- High Pressure Core Spray (HPCS) System
- Low Pressure Core Spray (LPCS) System
- Main Steam (MS) System
- Miscellaneous Drain (MD) System
- Process Sampling Radioactive (PSR) System
- Reactor Building Outside Air (ROA) System
- Reactor Closed Cooling Water (RCC) System
- Reactor Core Isolation Cooling (RCIC) System
- Residual Heat Removal (RHR) System
- Standby Liquid Control (SLC) System
- Standby Service Water (SW) System
- Tower Makeup Water (TMU) System

Add:
Heating Steam Condensate (HCO) System

A representative sample of components at susceptible locations will be examined for evidence of loss of material (due to crevice, galvanic, general, or pitting corrosion, or MIC), or to confirm a lack thereof.

The Supplemental Piping/Tank Inspection focuses on a limited but representative sample population of subject components at susceptible locations to be defined in the implementing documents, to include external piping surfaces and internal tank and piping surfaces at air-water interfaces. The inspections provide symptomatic evidence of loss of material at the other susceptible, but possibly inaccessible, locations (such as internal surfaces of piping) due to the similarities in materials and environmental conditions.

- Preventive Actions
  No actions are taken as part of the Supplemental Piping/Tank Inspection to prevent aging effects or to mitigate aging degradation.

- Parameters Monitored or Inspected
  The parameters to be inspected by the Supplemental Piping/Tank Inspection include wall thickness or visual evidence of internal and external surface degradation, as measures of loss of material. Inspections will be performed by qualified personnel

Operating Experience

The Water Control Structures Inspection has been effective in managing the identified aging effects. Visual inspections conducted by the Water Control Structures Inspection, implemented as part of the Structures Monitoring Program, have found no age-related problems.

The general structural condition of Standby Service Water Pump Houses "A" and "B" and their associated spray ponds is good. No adverse conditions or deficiencies (cracking, spalling, or honeycombs) were noted during the inspection of concrete structural elements (walls, slabs, beams, etc.) that would affect the structural integrity of either pump house or spray pond. Equipment anchorages were secured. No degraded conditions (bent or twisted members, cracked welds, loose or missing fasteners, etc) were identified for steel members. The "saddle" supports for the ring header were noted to have the coating delaminating in places. However, there were only minor amounts of corrosion products at those locations (i.e., not a structural concern). Pipe supports on spray pond walls were in good shape with all fasteners installed and tight. Doors and frames did not show any evidence of a degraded condition. There were no signs of moisture intrusion from the roof above and no signs of gross deficiencies (spalling, cracking, honeycombs) found from below. There were no obvious deficiencies identified with the crane structural frames. The rails appeared in good physical condition with no obvious signs of degradation such as bent or deformed rails. The Standby Service Water Pump Houses and the Spray Ponds are capable of performing their intended design function as the ultimate heat sink in response to accident conditions.

Replace with "and has been"

NRC Unresolved Item (URI) 05000397/2007005-02 was issued in February of 2008. This URI identified that Columbia had not performed nor scheduled condition monitoring, inspection, or preventative maintenance (since receiving an operating license in 1983) of the submerged portion of the suppression chamber, the standby service water spray ponds, or the condensate storage tanks. The URI stated that although the licensee performed some monitoring of these structures, failure to perform monitoring of the submerged portion of these structures could result in undetected cracks or leakage that could prevent them from meeting their design basis functions. This URI was documented in a condition report ~~that is currently being~~ resolved under the corrective action process with closure information ~~expected near the time of the LRA submittal~~.

Replace with "reviewed and accepted by the NRC"

The general conditions noted for the Circulating Water Pump House (including circulating water basin) and the cooling tower basins, including the structural components within the structures, was acceptable. Minor leaching was observed in the Circulating Water Pump House on a concrete pad near the interface with the siding, in addition to cracks in the wall along joints due to stresses caused by a hanger attached to the wall above the door, corrosion on the lower section of various door frames, and

The 37 Drawings specifically referenced in Enclosure 2 have been processed into ADAMS.

These drawings can be accessed by NRC Staff members within the ADAMS package or by performing a search on the Document/Report Number.

D-01 TO D-37X

For information only –3 copies

Revised Boundary Drawings

Drawing number	Reason
LR-216-01,3682	Added Rev 0 indication on drawing.
LR-225-02,21	Added Rev 0 indication on drawing.
LR-225-02,22	Added Rev 0 indication on drawing.
LR-M502-1	Revised
LR-M508-1	Revised
LR-M-513	Revised
LR-M515-4	Revised
LR-M515-5	Revised
LR-M517	Revised
LR-M525-2	Revised
LR-M526-1	Revised
LR-M526-2	Revised
LR-M527-1	Revised
LR-M537	Revised
LR-M539	Revised
LR-M604	Revised
LR-M788-1	Revised
LR-M852	Revised
LR-P541-1	Revised
LR-P542	Revised
LR-M502-3	New drawing
LR-M508-2	New drawing
LR-M514-1	New drawing
LR-M519	New drawing
LR-M521-2	New drawing
LR-M527-1	New drawing
LR-M527-2	New drawing
LR-M531	New drawing
LR-M532	New drawing
LR-M533-1	New drawing
LR-M533-2	New drawing
LR-M534	New drawing
LR-M536	New drawing
LR-M537	New drawing
LR-M543-2	New drawing
LR-M545-2	New drawing
LR-M545-3	New drawing