3.0 AGING MANAGEMENT REVIEW RESULTS

For those structures and components that are identified as being subject to an aging management review, 10 CFR 54.21(a)(3) requires demonstration that the effects of aging will be adequately managed so that their intended function(s) will be maintained consistent with the current licensing basis for the period of extended operation.

This section describes the results of the aging management reviews of the structures and components determined, during the scoping and screening processes, to be subject to an aging management review. Organization of this section is based on Tables 1 through 6 of Volume 1 of NUREG-1801, Generic Aging Lessons Learned (GALL), draft dated January 2005 (the GALL Report), and Chapter 3, “Aging Management Review Results,” of NUREG-1800, Standard Review Plan for the Review of License Renewal Applications for Nuclear Power Plants (SRP-LR), draft dated January 2005. The use of the draft January 2005 GALL Report is in accordance with the January 13, 2005 meeting between the NRC and NEI on updating license renewal guidance documents, as summarized and documented in a meeting summary dated February 17, 2005 (ML050490142).

Descriptions of the internal and external service environments that were used in the aging management review to determine aging effects requiring management are provided in Table 3.0-1 and Table 3.0-2. These tables also identify the equivalent NUREG-1801 environments. A description of the passive component materials identified in the Oyster Creek LRA is provided in Table 3.0-3. This table provides the Oyster Creek nomenclature used and the equivalent NUREG-1801 material identification. A description of the aging effects identified in the Oyster Creek LRA is provided in Table 3.0-4. This table also provides the equivalent NUREG-1801 aging effects.

This section is subdivided according to the following system groupings:

NUREG-1801 is the NRC Staff's generic evaluation of existing plant programs. The evaluation results documented in the report indicate that many of the existing programs are adequate to manage the aging effects for particular structures or components within the scope of license renewal, without change. The report also contains recommendations on specific areas for augmentation of existing programs for license renewal. In order to take full advantage of NUREG-1801, a comparison is made between the AMR results and the tables of NUREG-1801. The results of this comparison are provided in the following two tables:

Table 3.x.1 – where ‘3’ indicates LRA Section 3; ‘x’ indicates the subsection number; and ‘1’ indicates the first table type. For example, in the Reactor Vessel, Internals, and Reactor Coolant System section this table would be numbered 3.1.1 and in the Auxiliary Systems section, this table would be numbered 3.3.1. This table type is referred to as “Table 1.”

Table 3.x.2.1.y – where ‘3’ indicates LRA Section 3.0; ‘x’ indicates the subsection number; ‘2’ indicates the second table type; ‘1’ indicates the summary subsection for materials, environments, aging effects and aging management programs; and ‘y’ indicates the specific system being addressed. For example, within Section 3.1 for the Reactor Vessel, Internals, and Reactor Coolant System, the table number for the Reactor Internals would be 3.1.2.1.4; and for the Reactor Vessel would be 3.1.2.1.5. Also, within Section 3.2 for Engineered Safety Features, this table would be 3.2.2.1.1, for the Containment Spray System; and the next system, Core Spray, has a table numbered 3.2.2.1.2. This table type is referred to as “Table 2.”

FURTHER EVALUATION TEXT

In those cases where NUREG-1801, Volume 1 recommends “further evaluation” of an item by the reviewer, separate text sections are provided as an aid in these evaluations. These text sections provide the Oyster Creek positions for each item and address the issues raised in the “further evaluation recommended” sections of NUREG-1800, Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants. The LRA “further evaluation” section numbering aligns with the applicable issue text in Section 3 of NUREG-1800. For example, the first line item in NUREG-1801, Volume 1, Table 1 relates to fatigue of reactor coolant pressure boundary components. The “Further Evaluation Recommended” column notes that further evaluation is recommended. Discussion of review requirements for this item is outlined in Section 3.1.2.2.1 of NUREG-1800. Correspondingly, Section 3.1.2.2.1 of the LRA provides a discussion of the associated Oyster Creek position and aging management review results for the item. This correlation continues for all of the further evaluation items in Sections 3.1 through 3.6 of NUREG-1800.

Table Description

NUREG-1801, the GALL Report, contains the NRC staff’s generic evaluation of existing plant programs. It documents the technical basis for determining where existing programs are adequate without modification, and where existing programs should be augmented for the extended period of operation. The evaluation results documented in the report indicate that many of the existing programs are adequate to manage the aging effects for particular structures or components. The GALL Report also contains recommendations on the specific areas for which existing programs should be augmented for license renewal. In order to take full advantage of NUREG-1801, a comparison between the AMR results and the tables of NUREG-1801 has been made. The results of that comparison are provided in the tables in this section.

The purpose of Table 1 is to provide a summary comparison of specific plant AMR details with the corresponding tables of NUREG-1801, Volume 1. The table is essentially the same as Tables 1 through 6 of NUREG-1801, Volume 1, except that the “Type” column has been replaced by an “Item Number” column and the “Related Item” column has been replaced by a “Discussion” column. The “Item Number” column provides the reviewer with a means to cross reference from Table 2 to Table 1. The “Discussion” column is used to provide clarifying or amplifying information. The following are examples of information that might be contained within this column.

- “Further Evaluation Recommended” information or reference to where that information is located
- The name of a plant-specific program being used
- Exceptions to the NUREG-1801 assumptions
- A discussion of how the line is consistent with the corresponding line item in NUREG-1801, Volume 1, when it may appear inconsistent
- A discussion of how the item is different from the corresponding line item in NUREG-1801, Volume 1, when it may appear to be consistent (e.g., when there is exception taken to an aging management program that is listed in NUREG- 1801)

The format of Table 1 provides the reviewer with a means of aligning a specific Table 1 row with the corresponding NUREG-1801, Volume 1, table row, thereby allowing for the ease of checking consistency.

Table 2 provides the detailed results of the aging management reviews for those components/commodities identified in LRA Section 2 as being subject to aging management review. There will be a Table 2 for each of the systems within the associated system grouping. Table 2 consists of the following nine columns:

Component Type – The first column identifies the components from Section 2 that are subject to aging management review. They are listed in alphabetical order, and are the same as listed in the Section 2 Tables.

Intended Function – The second column contains the license renewal component intended functions for the listed component types. Definitions of intended functions are contained in Table 2.1-1.

Material – The third column lists the particular materials of construction for the component/commodity group. A description of passive component materials is provided in Table 3.0-3.

Environment – The fourth column lists the environment to which the component types are exposed. Internal and external service environments are indicated. The environments used in the Oyster Creek aging management reviews are listed below in Tables 3.0-1 and 3.0-2.

Aging Effect Requiring Management – As part of the aging management review process, aging effects requiring management are identified for material and environment combinations. The aging effects requiring management are those effects that must be managed to maintain the component intended function for the period of extended operation. These are listed in the fifth column.

The Oyster Creek aging management review methodology is based on generic industry guidance for determining aging effects, based on the materials of construction and applicable environmental conditions. The aging effects are derived from known age-related degradation mechanisms, industry operating experience and Oyster Creek operating experience. Sources of applicable aging effects include EPRI Non-Class 1 Mechanical Implementation Guideline and Mechanical Tools - Revision 3, NUREG-1801, and previous license renewal applications and associated NRC Safety Evaluation Reports.

Aging Management Programs – The aging management programs used to manage the aging effects requiring management are identified in the sixth column of Table 2. Aging management programs are described in Appendix B.

NUREG-1801, Volume 2 Item – Each combination of component, material, environment, aging effect and aging management program that is listed in Table 2, is compared to NUREG-1801, Volume 2, with consideration given to the standard notes, to identify consistency. Consistency is documented by noting the appropriate NUREG-1801, Volume 2, item number in the seventh column of Table 2. If there is no corresponding item number in NUREG-1801, Volume 2, this row in the seventh column is left blank. Thus, a reviewer can readily identify the correlation between the plant-specific tables and the NUREG-1801, Volume 2, tables.

Table 1 Item – When a NUREG-1801, Volume 2 item is identified in the seventh column, a corresponding Table 1 (LRA Table 3.x.1) summary item number is indicated in the eighth column. The Table 1 summary item number is based on the sequential "ID" column number in Tables 1 through 6 of NUREG-1801, Volume 1. The applicable Table 1 summary item number is derived from correlation of the "Related Item" in Tables 1 through 6 of NUREG-1801, Volume 1 with the Volume 2 item number in the seventh column.

Notes – The notes provided in each Table 2 describe how the information in the table aligns with the information in NUREG-1801. Each Table 2 contains both standard "lettered" notes and plant specific "numbered" notes.

The standard "lettered" notes (e.g., A, B, C…) provide generic information regarding comparison of the Oyster Creek aging management strategy with the NUREG-1801, Volume 2 Aging Management Table line item identified in the seventh column.

Generic notes A through E indicate that a useful comparison may be made between the Table 2 line item and NUREG-1801. Therefore, items associated with notes A through E will also contain a NUREG-1801 Volume 2 item and a reference to a Table 1 item. Generic note I will also include a NUREG-1801 Volume 2 item and a reference to a Table 1 item, with a plant specific (numbered) note justifying the lack of the GALL aging effect.

Notes F, G, H and J denote differences in material, environment, or aging effect requiring management that preclude a reviewer comparison. When these notes are utilized, no NUREG-1801, Volume 2 Aging Management Table item is associated with the Oyster Creek line item.

The plant-specific numbered notes (e.g., 1, 2, 3…) provide plant-specific information or clarification. These notes may indicate why an aging effect is or is not included, provide details regarding program application, or describe differences between the Oyster Creek item and corresponding NUREG-1801, Volume 2 Aging Management Table items.

Notes are shown for each system, immediately following the Table 2 for the system.

TABLE 1 USAGE

The reviewer evaluates each row in Table 1 by moving from left to right across the table. No evaluation of information in the Component, Aging Effect/ Mechanism, Aging Management Program or Further Evaluation Recommended columns is required, as this information is taken directly from NUREG-1801, Volume 1. The Discussion column provides the information of most use to the reviewer and summarizes the information necessary to determine how the aging management review results align with NUREG-1801, Volume 1.

TABLE 2 USAGE

Table 2 provides the aging management review information for the plant, irrespective of any comparisons to NUREG-1801. In a given row in the table, the reviewer can see the intended function, material, environment, aging effect requiring management, and aging management program combination for a component type. In addition, a referenced item number in column seven will identify any correlation between the information in Table 2 and that in NUREG-1801, Volume 2. The reviewer can refer to the item number in NUREG-1801, Volume 2 to verify the correlation. If the column is blank, no correlation to NUREG-1801, Volume 2 was identified. As the reviewer continues across the table from left to right in a row, the next column is labeled Table 1 Item. If there is a reference number to a corresponding row in Table 1, the reviewer can refer to Table 1 to determine how the aging management program for this combination aligns with NUREG-1801. Table 2 provides a reviewer with a means to navigate from the components subject to an aging management review in LRA Section 2 through the evaluation of aging management programs used to manage the effects of aging for the plant structures and components.

The NUREG-1801 Volume 2 tables are generally provided by system and structure. When making the correlations between the Oyster Creek components and NUREG-1801, matches within the equivalent or comparable NUREG system or structure were sought first. If a match could not be found in the equivalent system or structure, or if there was no equivalent NUREG system or structure, then matches were sought elsewhere within the same NUREG section, e.g., the Engineered Safety Features or Auxiliary Systems NUREG section. If a match could not be found within the same NUREG section, then a match was sought from other NUREG sections.

Cumulative Fatigue Damage and TLAAs in Table 2

A Fatigue analysis is a time-limited aging analysis (TLAA) as defined in 10 CFR 54.3. TLAAs are required to be evaluated in accordance with 10 CFR 54.21(c)(1). For those components subject to cumulative fatigue usage, the impact on existing TLAAs was evaluated and is addressed in Section 4.3.

Where specified by NUREG-1801 Volume 2, the following rules were used when applying TLAA to the aging effects associated with cumulative fatigue for a component:

1. For RCPB components, a TLAA is applied for the aging effects of cumulative fatigue to all piping.
2. In addition, TLAA is conservatively applied to RCPB piping components and piping elements, including valves, flow elements and thermowells, based on the NUREG-1801 definition of piping elements.
3. For non-RCPB components, a TLAA is applied for the aging effects of cumulative fatigue to piping only.

The use of TLAA in the following tables indicates that the current licensing basis was reviewed for TLAAs and the fatigue analysis was evaluated where one exists for that component. However, not every component has an explicit fatigue analysis. In the absence of an explicit fatigue analysis for a component, the effects of cumulative fatigue are managed by the other aging management programs for that component. For example, cumulative fatigue effects in bolting are managed by the Bolting Integrity program. Additionally, as stated in Section 4.3.3, piping and piping components were designed to codes and standards that require application of stress range reduction factors to account for cyclic thermal conditions. Maintaining plant thermal cycles within the limit (7000 cycles) ensures piping, piping components, and bolting are within fatigue limits.

Table 3.0-1 – Oyster Creek Internal Service Environments

Oyster Creek Environment	Description	Equivalent NUREG-1801 Environment
Auxiliary Steam[1]	Heating and process steam produced from heating boiler using Boiler Treated Water.	Steam
Boiler Treated Water [1]	Demineralized water subject to chemistry controls specified in the plant Auxiliary Boiler Chemistry procedure.	Treated Water
Closed Cooling Water	Treated water subject to water chemistry controls recommended in EPRI TR-107396, "Closed Cooling Water Chemistry Guidelines." Closed Cooling Water includes Reactor Building Closed Cooling Water (RBCCW), and Turbine Building Closed Cooling Water (TBCCW).	Closed cycle cooling water
Closed Cooling Water < 140^{o}F[2]	Closed cooling water below the temperature threshold for SCC in austenitic stainless steel components.	Closed cycle cooling water
Condensation	Condensation environment applies to internal surfaces of design features, such as drain traps, provided to collect potential moisture in gas or air systems.	Condensation (Internal/External)

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[1] This environment is not an exact match of the environment defined in NUREG-1801 because water chemistry is controlled to different guidelines. However for aging management review considerations it is considered equivalent.

[2] This environment is not an exact match of environments defined in NUREG-1801; however it is bounded by the listed equivalent NUREG-1801 environment.

Table 3.0-1 – Oyster Creek Internal Service Environments

Oyster Creek Environment	Description	Equivalent NUREG-1801 Environment
Containment Atmosphere	This environment is inert with nitrogen to render the atmosphere non-flammable by maintaining the oxygen content below 4% by volume. The average normal temperature inside the drywell is 139^{o}F, with a humidity range of 20-40%. The upper elevations (above elev. 95') of the drywell could be exposed to higher temperatures, up to 256^{o}F.	Air – Indoor Uncontrolled
Diesel Engine Exhaust gases	Gas present in diesel engine exhaust	Diesel Exhaust
Dry Gas	Carbon dioxide, halon, helium, dried air, hydrogen, oxygen, nitrogen	Gas Air, Dry
Fuel Oil	Diesel oil used for the combustion engines and heating boilers.	Fuel Oil
Indoor Air	Air in a sheltered environment, other than containment atmosphere. Air temperature range is 65^{o}F - 140^{o}F and the humidity is 100% maximum	Air – Indoor Uncontrolled
Lubricating Oil	Low to medium viscosity hydrocarbons used for lubrication of rotating equipment.	Lubricating Oil
Outdoor Air	Outdoor air environment is subject to local weather conditions. The mean temperature range is 23.7^{o}F - 84^{o}F and the average annual precipitation is approximately 42 inches.	Air - Outdoor

Table 3.0-1 – Oyster Creek Internal Service Environments

Oyster Creek Environment	Description	Equivalent NUREG-1801 Environment
Raw Water – Fresh Water	Fresh raw water is drawn from either a deep well or from the Fire Pond Dam. Water taken from the deep wells is processed in the pretreatment facility and used for domestic water or treated further and used as Demineralized water and for make up to the condensate storage and transfer system. Fresh water drawn from the Fire Pond Dam is untreated and is used for fire suppression and to the circulating water and service water pumps seals, and dilution pump oil coolers. Recent chemistry results show that the pH = 4.8, chlorides = 12 ppm, and sulfates = 6 ppm.	Raw Water
Raw Water – Salt Water	Raw salt water is drawn from Barnegat Bay, which receives salt water from the Atlantic Ocean and fresh water runoff from streams, which border it on the western shore, including Oyster Creek and Forked River. Recent tests of water samples taken at the Intake Structure and Canal showed that the pH = 7.9, Chlorides =14659 ppm, and Sulfates 1419 ppm. The average monthly water temperature range is 37^{o}F in the winter and 80^{o}F in summer	
Refrigerant	Inert gases such as Freon commonly used in refrigeration and air conditioning systems.	Gas
Sodium Pentaborate	This environment consists of treated water containing sodium pentaborate solution. The environment is found only in Standby Liquid Control System (Liquid Poison System)	Sodium pentaborate solution
Steam	Steam that is subject to BWR water chemistry controls	Steam

Table 3.0-1 – Oyster Creek Internal Service Environments

Oyster Creek Environment	Description	Equivalent NUREG-1801 Environment
Treated Water	Treated water is demineralized water and is the base water for all clean systems. Depending on the system, this demineralized water may require additional processing. Treated water can be deaerated, include corrosion inhibitors, biocides, or some combination of these treatments. Treated water is subject to BWR water chemistry controls. Treated water includes reactor grade water, spent fuel pool water, torus water, and demineralized water.	Treated Water Reactor Coolant
Treated Water < 140°F[1]	Treated Water below the temperature threshold for SCC in austenitic stainless steel components.	Treated Water
Treated Water > 482°F	Treated water above thermal embrittlement threshold for CASS components.	Treated Water > 482°F

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[1] This environment is not an exact match of environments defined in NUREG-1801; however it is bounded by the listed equivalent NUREG-1801 environment

Table 3.0-2 – Oyster Creek External Service Environments

Oyster Creek Environment	Description	Equivalent NUREG-1801 Environment
Adverse localized Environment	Environment, which could exist in limited plant areas caused by heat, radiation, moisture or voltage in the presence of oxygen. Used for electrical insulation only.	Adverse Localized Environment
Aggressive Environment[1]	Ground water and raw water environments are considered aggressive if pH < 5.5, or chlorides > 500 ppm, or sulfates > 1500 ppm.	Aggressive Environment
Boiler Treated Water[2]	Demineralized water subject to chemistry controls recommended by the boiler manufacturer. Water chemistry controls are implemented through plant procedures.	Treated Water
Closed Cooling Water	Treated water subject to water chemistry controls recommended in EPRI TR-107396, "Closed Cooling Water Chemistry Guidelines." Closed Cooling Water includes Reactor Building Closed Cooling Water (RBCCW), and Turbine Building Closed Cooling Water (TBCCW).	Closed cycle cooling water
Closed Cooling Water < 140°F[3]	Closed cooling water below the temperature threshold for SCC in austenitic stainless steel components.	Closed cycle cooling water
Concrete	Embedded or Encased in concrete	Concrete

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[1] This environment is not an exact match of aggressive environment defined in NUREG-1801, Table IX.D. However it is an exact match of the aggressive environment used in NUREG-1801 AMR tables, for example line Item III.A3-4 (T-05).

[2] This environment is not an exact match of the environment defined in NUREG-1801 because water chemistry is controlled to different guidelines. However for aging management review considerations it is considered equivalent.

[3] This environment is not an exact match of environments defined in NUREG-1801; however it is bounded by the listed equivalent NUREG-1801 environment

Table 3.0-2 – Oyster Creek External Service Environments

Oyster Creek Environment	Description	Equivalent NUREG-1801 Environment
Containment Atmosphere	This environment is inert with nitrogen to render the atmosphere non-flammable by maintaining the oxygen content below 4% by volume. The average normal temperature inside the drywell is 139^{o}F, with a humidity range of 20-40%. The upper elevations (above elev. 95') of the drywell could be exposed to higher temperatures, up to 256^{o}F. For bolting this environment includes potential leakage of treated water, steam, or raw water.	Air – Indoor Uncontrolled Air with Reactor Coolant Leakage Air with Steam or Water Leakage
Dry Gas	Nitrogen	Gas Air, Dry
Encased	Applies to components encapsulated in steel, or aluminum. Encased components are inaccessible, and not exposed to air, water, or other environments.	Environment not in NUREG-1801
Fuel Oil	Diesel oil used for the combustion engines and heating boilers.	Fuel Oil
Indoor Air	Air in a sheltered environment, other than containment atmosphere. Air temperature range is 65^{o}F - 140^{o}F and the humidity is 100% maximum. For bolting this environment includes potential leakage of treated water, steam, sodium pentaborate, or raw water.	Air – indoor Uncontrolled Air with Reactor Coolant Leakage Air with Steam or Water Leakage
Lubricating Oil	Low to medium viscosity hydrocarbons used for lubrication of rotating equipment.	Lubricating Oil
Outdoor Air	Outdoor air environment is subject to local weather conditions. The mean temperature range is 23.7^{o}F - 84^{o}F and the average annual precipitation is approximately 42 inches.	Air - Outdoor

Table 3.0-2 – Oyster Creek External Service Environments

Oyster Creek Environment	Description	Equivalent NUREG-1801 Environment
Raw Water – Fresh Water	Fresh raw water is drawn from either a deep well or from the Fire Pond Dam. Water taken from the deep wells is processed in the pretreatment facility and used for domestic water or treated further and used as Demineralized water and for make up to the condensate storage and transfer system. Fresh water drawn from the Fire Pond Dam is untreated and is used for fire suppression and to the circulating water and service water pumps seals, and dilution pump oil coolers. Recent chemistry results show that the pH = 4.8, chlorides = 12 ppm, and sulfates = 6 ppm.	Raw Water
Raw Water – Salt Water	Raw salt water is drawn from Barnegat Bay, which receives salt water from the Atlantic Ocean and fresh water runoff from streams, which border it on the western shore, including Oyster Creek and Forked River. Recent tests of water samples taken at the Intake Structure and Canal showed that the pH = 7.9, Chlorides =14659 ppm, and Sulfates 1419 ppm. The average monthly water temperature range is 37^{o}F in the winter and 80^{o}F in summer.	
Soil	External environment for structures and components buried in soil. Buried structures and components may be exposed to groundwater if they are located below the local ground water elevation. Site groundwater has been tested and determined non-aggressive to concrete.	Soil
Steam	Steam that is subject to BWR water chemistry controls	Steam

Table 3.0-2 – Oyster Creek External Service Environments

Oyster Creek Environment	**Description**	**Equivalent NUREG-1801 Environment**
Treated Water	Treated water is demineralized water and is the base water for all clean systems. Depending on the system, this demineralized water may require additional processing. Treated water can be deaerated, include corrosion inhibitors, biocides, or some combination of these treatments. Treated water is subject to BWR water chemistry controls. Treated water includes reactor grade water, spent fuel pool water, torus water, and demineralized water.	Treated water
Treated Water < 140°F[1]	Treated Water below the temperature threshold for SCC in austenitic stainless steel components.	Treated water
Treated Water > 482°F	Treated water above thermal embrittlement threshold for CASS components.	Treated water > 482°F
Water – flowing	Water that is refreshed, thus having larger impact on leaching of calcium hydroxide from concrete structures.	Water - flowing
Water - standing	Water that is stagnant and un-refreshed, thus possibly resulting in increased ionic strength of solution up to saturation	Water - standing

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[1] This environment is not an exact match of environments defined in NUREG-1801; however it is bounded by the listed equivalent NUREG-1801 environment

Table 3.0-3 – Oyster Creek Passive Component Materials

Oyster Creek Material	Equivalent NUREG-1801 Material	Comments
Alloy steel	Steel	Alloy steel closure bolting with yield strength < 150 ksi; except for the reactor vessel bolting, and bolting in the Control Rod Drive system which are high-strength bolting (yield > 150 ksi)
Aluminum	Aluminum	
Alumina Silica	Material not in NUREG-1801	Alumina silica consists of high temperature ceramic fibers and inorganic binders. The material is used in fire rated barriers.
Aluminum bronze	Copper alloy	
Asbestos (Thermal Insulation)	Material not In NUREG-1801	Fibrous material used for thermal insulation of piping and components
Boraflex	Boraflex	
Boral	Boral	
Brass	Copper alloy	
Bronze	Copper alloy	
Calcium Silicate (Thermal Insulation)	Material not In NUREG-1801	Thermal insulation material manufactured from mineral fiber and molded or shaped to easily fit around piping and components
CASS	Cast austenitic stainless steel (CASS)	
Carbon and low alloy steel	Steel	
Cast Iron	Steel Gray cast iron	For Oyster Creek, cast iron is treated as gray cast iron and subject to loss of material due to selective leaching.

Table 3.0-3 – Oyster Creek Passive Component Materials

Oyster Creek Material	Equivalent NUREG-1801 Material	Comments
Chrome Moly	Steel	Chrome Moly is not specifically identified in NUREG-1801. The material provides high resistance to loss of material due to flow-accelerated corrosion (FAC). However it is conservatively treated as carbon steel.
Concrete	Concrete	
Copper	Copper alloy <15% Zn	
Copper Alloy	Copper alloy > 15% Zn	
Elastomer	Elastomer	Butyl, Rubber, Neoprene, silicones
Epoxy Potting	Material not in NUREG-1801	Epoxy resin material used as a pressure boundary for containment electrical penetrations.
Fiberglass (Thermal Insulation)	Material not in NUREG-1801	Semi-rigid fibrous glass quilted between two layers of scrim and encapsulated in a fiberglass cloth, jackets, forming a composite blanket; or pre-molded fiberglass modules and panels encased in fiberglass jackets.
Galvanized steel	Galvanized Steel	
Glass	Glass	
Gravel, Sand	Material not in NUREG-1801	Crushed stone and sand used for tank foundations.
Grout	Grout	
Gypsum board	Material not in NUREG-1801	Wallboard used in fire barriers.
Insulation material – bakelite, phenolic melamine or ceramic, molded polycarbonate	Insulation materials (e.g. bakelite, phenolic melamine or ceramic, molded polycarbonate)	

Table 3.0-3 – Oyster Creek Passive Component Materials

Oyster Creek Material	**Equivalent NUREG-1801 Material**	**Comments**
High strength alloy steel	Low-alloy steel, yield strength >150 ksi	Closure bolting for the reactor vessel and in the Control Rod Drive system.
Lubrite	Lubrite	
Masonry	Concrete block	
Mecatiss	Material Not NUREG-1801	Mecatiss is a trade name for fire barrier material. It consists of layers of mineral wool covered internally and externally by fiberglass cloth, which is saturated with a patented silicon sealer. Each layer of wool and cloth is also coated with patented mastic glue, which forms heat and moisture barriers.
Nickel alloy	Nickel alloys	
NUKON (Thermal Insulation)	Material Not in NUREG-1801	NUKON insulation system consists of fiberglass blankets, modules, or panels used for thermal insulation of piping and components inside the primary containment drywell.
Permali	Material Not in NUREG-1801	Trade name for a composite material used for shielding purposes in the primary containment biological shield wall penetrations.
Plexiglass	Material Not in NUREG-1801	Plexiglass is clear plastic material (Lucite) used in the Standby Gas Treatment ductwork.
Polyethylene	Material Not in NUREG-1801	
Polymers	Polymer (e.g., rubber)	Polymers in the Oyster Creek LRA are plastic materials. Rubbers are addressed as elastomers.
Polypropylene	Material Not in NUREG-1801	Polypropylene is a thermoplastic material with good resistance to strong acids, weak to strong alkalis, and most organic solvents. The material is used for chlorination system piping

Table 3.0-3 – Oyster Creek Passive Component Materials

Oyster Creek Material	Equivalent NUREG-1801 Material	Comments
Polyvinyl chloride (PVC, CPVC)	Material Not in NUREG-1801	PVC and CPVC piping and fitting and conduits.
Porcelain, Malleable iron, aluminum, galvanized steel, cement	Porcelain, Malleable iron, aluminum, galvanized steel, cement	Used for High Voltage Insulators
Pyrocrete	Material Not in NUREG-1801	Used as Fire Barrier
Roofing Material	Material Not in NUREG-1801	Built-up roofing materials (waterproofing membrane, felt, tar, flashing, etc.) for structures,
Stainless steel	Stainless steel	
Tar	Material Not in NUREG-1801	Bituminous materials used for sealing concrete joints, and intake canal slope protection.
Thermo-Lag	Material Not in NUREG-1801	Used as Fire Barrier
Titanium	Material Not in NUREG-1801	Heat exchanger titanium tubes.
Treated wood	Material Not in NUREG-1801	Pressure treated utility poles, wood piles and wood sheeting used in water control structures.
Various (Gravel, Tar, Soil, wood, galvanized steel)	Various	Material that make dams, canals, and other earthen water control structures
Various metals used for electrical connections	Various metals used for electrical contacts	
Various organic polymers (e.g. EPR, XLPE, PVC, ETFE)	Various organic polymers (e.g. EPR, SR, EPDM, XLPE)	Polymers used in electrical applications
Zinc	Material Not in NUREG-1801	

Table 3.0-4 – Oyster Creek Aging Effects

Oyster Creek Aging Effects	**Description or Explanation**	**Equivalent NUREG-1801 Aging Effects**
Change in Material Properties - Concrete	Change in material properties is used to designate loss of bond, increase in porosity and permeability, and loss of strength listed in NUREG-1801. Change in material properties is evidenced in concrete structures and structural members as increased permeability, increased porosity, reduction in pH, reduction in tensile strength, reduction in compressive strength, reduction in modulus of elasticity, and reduction in bond strength.	Loss of Bond/ Corrosion of Rebar Increase in Porosity and Permeability/Aggressive Chemical Attack Increase in Porosity and permeability, Loss of Strength/ Leaching Hydroxide Increase in Porosity, Permeability/ Leaching of Calcium Hydroxide Reduction of Strength and Modulus/ Elevated Temperature (>150^{o} F general; >200^{o} F local)
Change in Material Properties - Elastomer	Change in material properties is used to designate increased hardness, shrinkage and loss of strength due to weathering and hardening and loss of strength due to elastomer degradation.	Increased Hardness, Shrinkage and loss of strength/ Weathering Hardening and Loss of Strength/ Elastomer Degradation
Cracking - Concrete	Cracking in concrete may be due to reaction with aggregate, corrosion of embedded steel, freeze-thaw, aggressive chemical attack, elevated temperature, shrinkage, and settlement. Aging mechanisms are not specifically listed in the AMR tables. However, the applicable mechanisms are addressed as indicated by NUREG-1801 Vol. 2 Item line number.	Expansion and Cracking/ Reaction with Aggregate Loss of Material (Spalling, Scaling) and Cracking/ Freeze-Thaw Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)/ Corrosion of Embedded Steel Increase in Porosity and Permeability, Cracking, Loss of Material (Spalling, Scalling)/ Aggressive Chemical Attack Cracks and distortion due to increased stress levels from settlement
Cracking - Masonry	Cracking of masonry walls is due to restraint against expansion and contraction, shrinkage, and creep. The walls are not exposed to aggressive environment.	Cracking due to Restraint shrinkage, Creep, and Aggressive Environment

Table 3.0-4 – Oyster Creek Aging Effects

Oyster Creek Aging Effects	Description or Explanation	Equivalent NUREG-1801 Aging Effects
Cracking Initiation and Growth	This term is synonymous to the “cracking” standardized expression in NUREG-1801. The Oyster Creek AMR tables present aging at the aging effect level and do not specifically list the associated aging mechanisms. However aging management reviews consider the applicable aging mechanisms and the credited aging management programs are reviewed to ensure that the applicable aging mechanisms are adequately managed.	Cracking/ Cyclic Loading Cracking/ Stress Corrosion Cracking Cracking / Stress Corrosion Cracking and Intergranular Stress Corrosion Cracking Cracking / Stress Corrosion Cracking, Intergranular Stress Corrosion Cracking, and Cyclic Loading Cracking/ Stress Corrosion Cracking, Intergranular Stress Corrosion Cracking, Irradiation-assisted Stress Corrosion Cracking Cracking/ Flow-Induced vibration Cracking/ Thermal and Mechanical Loading
Cumulative Fatigue Damage (TLAA)	Cumulative fatigue damage is due to fatigue as defined by ANSI B31.1, ASME III, and ASME VIII.	Cumulative Fatigue Damage
Embrittlement, Cracking, Melting, Discoloration, Swelling, or Loss of Dielectric Strength Leading to Reduced Insulation Resistance (IR); Electric Failure/ Degradation of Organics (Thermal/Thermoxidative), Radioalysis and Photolysis (UV Sensitive Materials only) of Organics; Radiation-induced Oxidation, and Moisture Intrusion	Same as NUREG-1801 Table IX.E	Embrittlement, Cracking, Melting, Discoloration, Swelling, or Loss of Dielectric Strength Leading to Reduced Insulation Resistance (IR); Electric Failure/ Degradation of Organics (Thermal/Thermoxidative), Radioalysis and Photolysis (UV Sensitive Materials only) of Organics; Radiation-induced Oxidation, and Moisture Intrusion
Fretting or Lockup	Same as NUREG-1801 Table IX.E	Fretting or Lockup

Table 3.0-4 – Oyster Creek Aging Effects

Oyster Creek Aging Effects	Description or Explanation	Equivalent NUREG-1801 Aging Effects
Localized Damage and Breakdown of Insulation Leading to Electrical Failure/ Moisture Intrusion, Water Trees	Same as NUREG-1801 Table IX.E	Localized Damage and Breakdown of Insulation Leading to Electrical Failure/Moisture Intrusion, Water Trees
Loss of Form	In earthen water-control structures, loss of form can result from erosion, settlement, sedimentation, frost action, waves, currents, surface runoff, and seepage.	Loss of Form
Loss of Fracture Toughness	Same as NUREG-1801 Table IX.E	Loss of Fracture Toughness/ Thermal Aging Embrittlement Loss of Fracture Toughness/ Neutron Irradiation Embrittlement Loss of Fracture Toughness/ Thermal Aging and Neutron Irradiation Embrittlement
Loss of Leak Tightness	The primary containment personnel/equipment airlock can experience loss of leak tightness in closed position resulting from mechanical wear of locks, hinges, and closure mechanisms	Loss of Leak Tightness

Table 3.0-4 – Oyster Creek Aging Effects

Oyster Creek Aging Effects	Description or Explanation	Equivalent NUREG-1801 Aging Effects
Loss of Material • Metallic materials	Loss of material for metallic materials can be the result of one or more aging mechanism including general corrosion, pitting, crevice corrosion, microbiologically influenced corrosion, fouling, flow-accelerated corrosion, galvanic corrosion, selective leaching, and wear. The Oyster Creek AMR tables present aging at the aging effect level and do not specifically list the applicable aging mechanisms. However the Oyster Creek aging management reviews consider the applicable aging mechanisms and the credited aging management programs are reviewed to ensure that the applicable aging mechanisms are adequately managed. For example loss of material due galvanic corrosion is managed by programs that manage loss of material due to general corrosion, such as water chemistry programs and one-time inspection or by periodic inspections. The NRC staff has found that these activities are adequate to manage loss of material due to galvanic corrosion (D/QC SER NUREG-1796, Section 3.3.2.5). Selective leaching and flow-accelerated corrosion mechanisms are also not specifically listed in the Oyster Creek AMR tables. However loss of material due to selective leaching is evaluated as indicated by the use of the Selective Leaching of Materials program. Loss of material or “Wall Thinning” due to flow-accelerated corrosion is evaluated as indicated by identification of the applicable NUREG-1801 Vol. 2 line number and by the use of Flow-Accelerated Corrosion program.	Loss of Material/ General, Pitting, and Crevice Corrosion Loss of Material/ Corrosion Loss of Material/ General Corrosion Loss of Material/ General (Steel Only), Pitting and Crevice Corrosion Loss of Material/ Pitting, Crevice, and Microbiologically influenced Corrosion, and Fouling Loss of Material/ General, Pitting, Crevice, and Microbiologically Influenced Corrosion Loss of Material/ General and Pitting Corrosion Loss of Material/Microbiologically Influenced Corrosion Loss of Material/ Pitting and Crevice Corrosion Loss of Material/ Pitting and Crevice Corrosion, and Fouling Loss of Material/ Pitting, Crevice, and Galvanic Corrosion Loss of Material/ Selective Leaching Loss of Material/ Selective Leaching and General Corrosion Loss of Material/ Wear Wall Thinning/ Flow-Accelerated Corrosion

Table 3.0-4 – Oyster Creek Aging Effects

Oyster Creek Aging Effects	Description or Explanation	Equivalent NUREG-1801 Aging Effects
Loss of Material - Concrete	Loss of material in concrete may be due to corrosion of embedded steel, freeze-thaw, aggressive chemical attack, and abrasion or cavitation. Aging mechanisms are not specifically listed in the Oyster Creek AMR tables. However, the applicable mechanisms are addressed as indicated by NUREG-1801 Vol. 2 Item line number.	Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)/ Corrosion of Embedded Steel Loss of Material (Spalling, Scaling) and Cracking/ Freeze-Thaw Increase in Porosity and Permeability, Cracking, Loss of Material (Spalling, Scalling)/ Aggressive Chemical Attack Loss of Material/ Abrasion; Cavitation Loss of Material/ Corrosion of Embedded Steel
Loss of Material, Loss of Form	Same as NUREG-1801 Table IX.E	Loss of Material, Loss of Form
Loss of Mechanical Function	Same as NUREG-1801 Table IX.E	Loss of Mechanical Function
Loss of Preload	Same as NUREG-1801 Table IX.E	Loss of Preload
Loss of Sealing	Same as NUREG-1801 Table IX.E	Loss of Sealing; Leakage Through Containment
Not Applicable	The aging effect in NUREG-1801 is determined not applicable to Oyster Creek material and environment combination. A basis for this determination is provided in a plant specific note.	
None	The material in the specified environment does not result in an aging effect requiring management.	None
Reduction in Anchor Capacity Due to Local Concrete Degradation	Same as NUREG-1801 Table IX.E	Reduction in Anchor Capacity Due to Local Concrete Degradation

Table 3.0-4 – Oyster Creek Aging Effects

Oyster Creek Aging Effects	Description or Explanation	Equivalent NUREG-1801 Aging Effects
Reduction of Heat Transfer	Same as NUREG-1801 Table IX.E	Reduction of Heat Transfer
Reduction of Neutron-Absorbing Capacity	Same as NUREG-1801 Table IX.E	Reduction of Neutron-Absorbing Capacity
Reduction or Loss of Isolation Function	Same as NUREG-1801 Table IX.E	Reduction or Loss of Isolation Function
Various degradation / various mechanisms	Same as NUREG-1801	Various degradation / various mechanisms

3.1 AGING MANAGEMENT OF REACTOR VESSEL, INTERNALS, AND REACTOR COOLANT SYSTEMS

3.1.1 INTRODUCTION

This section provides the results of the aging management review for those components identified in Section 2.3.1, Reactor vessel, Internals, and Reactor Coolant Systems (RCS), as being subject to aging management review. The systems, or portions of systems, which are addressed in this section are described in the indicated sections.

- Isolation Condenser System (2.3.1.3)
- Nuclear Boiler Instrumentation System (2.3.1.4)
- Reactor Head Cooling System (2.3.1.5)
- Reactor Internals (2.3.1.6)
- Reactor Pressure Vessel (2.3.1.7)
- Reactor Recirculation System (2.3.1.8)

3.1.2 RESULTS

3.1.2.1 Materials, Environments, Aging Effects Requiring Management And Aging Managements Programs For The Reactor Vessel, Internals, And Reactor Coolant System

3.1.2.1.1 Isolation Condenser System

Materials

The materials of construction for the Isolation Condenser System components are:

- Alloy Steel
- Carbon and low alloy steel
- Cast Austenitic Stainless Steel (CASS)
- Stainless Steel

Environments

The Isolation Condenser System components are exposed to the following environments:

- Containment Atmosphere
- Indoor Air
- Outdoor Air
- Steam
- Treated Water
- Treated Water < 140F

Aging Effects Requiring Management

The following aging effects associated with the Isolation Condenser System components require management:

- Cracking Initiation and Growth
- Cumulative Fatigue Damage (TLAA)
- Loss of Fracture Toughness
- Loss of Material
- Loss of Preload
- Reduction of Heat Transfer

Aging Management Programs

The following aging management programs manage the aging effects for the Isolation Condenser System components:

- ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD
- Bolting Integrity
- BWR Stress Corrosion Cracking
- One Time Inspection
- Structures Monitoring Program
- Water Chemistry

Table 3.1.2.1.1, Summary of Aging Management Evaluation – Isolation Condenser System summarizes the results of the aging management review for the Isolation Condenser System.

3.1.2.1.2 Nuclear Boiler Instrumentation System

Materials

The materials of construction for the Nuclear Boiler Instrumentation System components are:

- Alloy Steel
- Carbon and Low Alloy Steel
- Stainless Steel

Environments

The Nuclear Boiler Instrumentation System components are exposed to the following environments:

- Containment Atmosphere
- Indoor Air
- Steam
- Treated Water
- Treated Water < 140F

Aging Effects Requiring Management

The following aging effects associated with the Nuclear Boiler Instrumentation System components require management:

- Cracking Initiation and Growth
- Cumulative Fatigue Damage (TLAA)
- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Nuclear Boiler Instrumentation System components:

- ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD
- Bolting Integrity
- BWR Stress Corrosion Cracking
- One-Time Inspection
- Water Chemistry

Table 3.1.2.1.2, Summary of Aging Management Evaluation – Nuclear Boiler Instrumentation System summarizes the results of the aging management review for the Nuclear Boiler Instrumentation System.

3.1.2.1.3 Reactor Head Cooling System

Materials

The materials of construction for the Reactor Head Cooling System components are:

- Alloy Steel
- Carbon and Low Alloy Steel
- Cast Austenitic Stainless Steel (CASS)
- Stainless Steel

Environments

The Reactor Head Cooling System components are exposed to the following environments:

- Containment Atmosphere
- Indoor Air
- Steam
- Treated Water
- Treated Water < 140F

Aging Effects Requiring Management

The following aging effects associated with the Reactor Head Cooling components require management:

- Cumulative Fatigue Damage (TLAA)
- Cracking Initiation and Growth
- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Reactor Head Cooling System components:

- ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD
- Bolting Integrity
- One Time Inspection
- Structures Monitoring Program
- Water Chemistry

Table 3.1.2.1.3, Summary of Aging Management Evaluation – Reactor Head Cooling System summarizes the results of the aging management review for the Reactor Head Cooling System.

3.1.2.1.4 Reactor Internals

Materials

The materials of construction for the Reactor Internal components are:

- Cast Austenitic Stainless Steel (CASS)
- Nickel Alloy
- Stainless Steel

Environments

The Reactor Internal components are exposed to the following environments:

- Containment Atmosphere
- Steam
- Treated Water
- Treated Water > 482F

Aging Effects Requiring Management

The following aging effects associated with the Reactor Internals require management

- Cracking Initiation and Growth
- Cumulative Fatigue Damage (TLAA)
- Loss of Fracture Toughness

Aging Management Programs

The following aging management programs manage the aging effects for the Reactor Internal components:

- BWR Vessel Internals
- Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS)
- Water Chemistry

Table 3.1.2.1.4, Summary of Aging Management Evaluation – Reactor Internals summarizes the results of the aging management review for the Reactor Internals.

3.1.2.1.5 Reactor Pressure Vessel

Materials

The materials of construction for the Reactor Pressure Vessel components are:

- Carbon and Low Alloy Steel
- Carbon and Low Alloy Steel (with stainless cladding)
- High Strength Alloy Steel
- Nickel Alloy
- Stainless Steel

Environments

The Reactor Pressure Vessel components are exposed to the following environments:

- Containment Atmosphere
- Steam
- Treated Water
- Treated Water > 482F

Aging Effects Requiring Management

The following aging effects associated with the Reactor Pressure Vessel require Management

- Cracking Initiation and Growth
- Cumulative Fatigue Damage (TLAA)
- Loss of Material
- Loss of Fracture Toughness

Aging Management Programs

The following aging management programs manage the aging effects for the Reactor Pressure Vessel components:

- ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWC
- BWR Control Rod Drive Return Line Nozzle
- BWR Feedwater Nozzle
- Reactor Head Closure Studs
- BWR Penetrations
- BWR Stress Corrosion Cracking
- BWR Vessel ID Attachment Welds
- BWR Vessel Internals
- One Time Inspection
- Reactor Head Closure Studs
- Reactor Vessel Surveillance
- Water Chemistry

Table 3.1.2.1.5, Summary of Aging Management Evaluation – Reactor Pressure Vessel summarizes the results of the aging management review for the Reactor Pressure Vessel.

3.1.2.1.6 Reactor Recirculation System

Materials

The materials of construction for the Reactor Recirculation System components are:

- Alloy Steel
- Carbon and low alloy steel
- Cast Austenitic Stainless Steel (CASS)
- Glass
- Stainless steel

Environments

The Oyster Creek Reactor Recirculation System components are exposed to the following environments:

- Containment Atmosphere
- Indoor Air
- Lubricating Oil
- Treated Water
- Treated Water < 140F
- Treated Water > 482F

Aging Effects Requiring Management

The following aging effects associated with the Reactor Recirculation components require management:

- Cracking Initiation and Growth
- Cumulative Fatigue Damage (TLAA)
- Loss of Fracture Toughness
- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Reactor Recirculation System components:

- ASME Section XI Inservice Inspection, subsections IWB, IWC, and IWD
- Bolting Integrity
- BWR Stress Corrosion Cracking
- Lubricating Oil Monitoring
- One-Time Inspection Activities
- Structures Monitoring Program
- Water Chemistry

Table 3.1.2.1.6, Summary of Aging Management Evaluation – Reactor Recirculation System summarizes the results of the aging management review for the Reactor Recirculation System.

3.1.2.2 AMR Results Consistent with the GALL Report for Which Further Evaluation is Recommended

NUREG-1801 provides the basis for identifying those programs that warrant further evaluation by the reviewer in the LRA. For the Reactor Vessel, Internals, and Reactor Coolant System, those programs are addressed in the following subsections.

3.1.2.2.1 Cumulative Fatigue Damage (BWR/PWR)

Fatigue is a time-limited aging analysis (TLAA) as defined in 10 CFR 54.3. TLAAs are required to be evaluated in accordance with 10 CFR 54.21(c)(1). The evaluation of this TLAA is addressed separately in Section 4.3.

For Oyster Creek the evaluation of fatigue for the reactor vessel and the reactor internals is discussed in Sections 4.3.1 and 4.3.2, respectively. The evaluation of fatigue as a TLAA for the Class 1 portions of the reactor coolant boundary piping and components, including those for Core Spray System, Isolation Condenser, the Reactor Recirculation System, Shutdown Cooling System, Control Rod Drive, Feedwater, Main Steam, Post-Accident Sampling, Standby Liquid Control, Nuclear Boiler Instrumentation, Reactor Head Cooling System, and Reactor Water Cleanup Systems is discussed in Section 4.3.3.

3.1.2.2.2 Loss of Material due to General, Pitting, and Crevice Corrosion (BWR/PWR)

1. Loss of material due to general, pitting, and crevice corrosion in a steel PWR steam generator shell assembly (PWR)

   This is applicable to PWRs only.

2. Loss of material due to pitting and crevice corrosion could occur in stainless steel BWR isolation condenser components. General, pitting, and crevice corrosion could occur in steel BWR isolation condenser components. The existing program relies on control of reactor water chemistry to mitigate corrosion and on ASME Section XI inservice inspection (ISI). However, the existing program should be augmented to detect loss of material due to general, pitting or crevice corrosion. The GALL report recommends an augmented program to include temperature and radioactivity monitoring of the shell-side water, and eddy current testing of tubes to ensure that the component's intended function will be maintained during the period of extended operation.

   Oyster Creek will use the Water Chemistry program, B.1.2, to manage aging of stainless steel tube side components of the Isolation Condenser System exposed to reactor coolant. The program activities provide for monitoring and controlling of water chemistry using station procedures and processes for the prevention or mitigation of loss of material aging effects. The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program, B.1.1, will be used with the Water Chemistry program to manage loss of material. The ASME Section XI Inservice

Inspection program will be enhanced to perform inspection of the isolation condenser tube side components, including temperature and radioactivity monitoring of the shell-side water, eddy current testing of the tubes, and inspection (VT or UT) of the tubesheet and channel head to ensure that significant degradation is not occurring and the component intended function will be maintained during the extended period of operation. Observed conditions that have the potential for impacting the intended function are evaluated or corrected in accordance with the corrective action process. The Water Chemistry program and the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program are described in Appendix B.

3.1.2.2.3 Loss of Fracture Toughness due to Neutron Irradiation Embrittlement (BWR/PWR)

1. Neutron irradiation embrittlement is a time-limited aging analysis (TLAA) to be evaluated for the period of extended operation for all ferritic materials that have a neutron fluence greater than 10^{17} n/cm2 (E >1 MeV) at the end of the license renewal term. Certain aspects of neutron irradiation embrittlement are TLAAs as defined in 10 CFR 54.3. TLAAs are required to be evaluated in accordance with 10 CFR 54.21(c)(1). The evaluation of this TLAA is addressed separately in Section 4.2.

   For Oyster Creek the effects of increased neutron fluence on the fracture toughness of the reactor vessel beltline plates and welds is discussed in Section 4.2. Also discussed in 4.2 is the impact on the vessel's temperature- pressure curves and weld exam requirements.

2. Loss of fracture toughness due to neutron irradiation embrittlement could occur in BWR and PWR reactor vessels. A reactor vessel materials surveillance program monitors neutron irradiation embrittlement of the reactor vessel. Reactor vessel surveillance programs are plant specific, depending on matters such as the composition of limiting materials, availability of surveillance capsules, and projected fluence levels. In accordance with 10 CFR Part 50, Appendix H, an applicant is required to submit its proposed withdrawal schedule for approval prior to implementation. Thus, further staff evaluation is required for license renewal.

   The Oyster Creek Reactor Vessel Surveillance program, B.1.23, is based the BWR Integrated Surveillance Program (ISP) and satisfies the requirements of 10 CFR 50, Appendix H. The reactor vessel surveillance aging management program includes periodic testing of metallurgical surveillance samples to monitor the progress of neutron embrittlement of the reactor pressure vessel as a function of neutron fluence, in accordance with Regulatory Guide (RG) 1.99, “Radiation Embrittlement of Reactor Vessel Materials," Revision 2. BWRVIP-116 identifies and schedules additional capsules to be withdrawn and tested during the license renewal period. Oyster Creek will continue to participate in using the Integrated Surveillance Program during the period of extended operation by implementing the requirements of BWRVIP-116, and by addressing any additional actions required by the associated NRC Safety Evaluation with BWRVIP-116, once it is approved. Observed conditions that have the potential for impacting the intended function are evaluated or corrected in accordance with the corrective action process. The Reactor Vessel Surveillance program is described in Appendix B.

3. Loss of fracture toughness due to neutron irradiation embrittlement in Westinghouse and B&W baffle/former bolts and screws (PWR).

   This is applicable to PWRs only.

3.1.2.2.4 Cracking due to Stress Corrosion Cracking and Intergranular Stress Corrosion Cracking (BWR)

1. Cracking due to stress corrosion cracking (SCC) and intergranular stress corrosion cracking [IGSCC]) could occur in small-bore steel and stainless steel reactor coolant system and connected system piping less than Nominal Pipe Size (NPS) 4. The existing program relies on ASME Section XI ISI and on control of water chemistry to mitigate SCC. The GALL report recommends that a plant-specific destructive examination or a nondestructive examination (NDE) that permits inspection of the inside surfaces of the piping be conducted to ensure that cracking has not occurred and the component intended function will be maintained during the period of extended operation. The AMPs should be augmented by verifying that service-induced weld cracking is not occurring in the small-bore piping less than NPS 4, including pipe, fittings, and branch connections.

   Stress corrosion cracking (SCC) and intergranular stress corrosion cracking (IGSCC) of carbon and low alloy steels are not considered applicable aging mechanisms in steam or treated water environments. This is in accordance with EPRI Mechanical Tools Appendix A.

   Oyster Creek will use the Water Chemistry program, B.1.2, to mitigate aging due to stress corrosion cracking and intergranular stress corrosion cracking of stainless steel piping, piping components, fittings and branch connection components exposed to reactor coolant within the RCPB, including those components in Core Spray, the Reactor Recirculation, Shutdown Cooling, Control Rod Drive, Feedwater, Main Steam, Standby Liquid Control, Nuclear Boiler Instrumentation, Reactor Head Cooling System, Reactor Water Cleanup, Post-Accident Sampling, and Isolation Condenser Systems. The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program, B.1.1, will be used with the Water Chemistry Program to manage the effects of stress corrosion cracking. Oyster Creek will also use The One-Time Inspection program, B.1.24, to verify that service-induced weld cracking is not occurring in the small-bore piping less than NPS 4, including pipe, fittings, and branch connections. The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD programs will also be used for Class 1 stainless steel pipe, piping components, fittings, and branch connections that are greater than or equal to NPS 4 to verify stress corrosion cracking is not occurring and to ensure the component intended function will be maintained during the extended period of operation.

Observed conditions that have the potential for impacting the intended function are evaluated or corrected in accordance with the corrective action process. The Water Chemistry program, The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program and the One-Time Inspection program are described in Appendix B.

2. Cracking due to SCC and IGSCC could occur in the stainless steel and nickel alloy BWR reactor vessel flange leak detection lines. The GALL report recommends that a plant-specific aging management program be evaluated because existing programs may not be capable of mitigating or detecting cracking due to SCC.

   Oyster Creek will use the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program, B.1.1, to ensure the reactor vessel flange leak detection lines are not experiencing aging effects caused by SCC and IGSCC. The Oyster Creek ISI Program utilizes a VT-2 visual examination on the line prior to reactor cavity drain down during each refueling outage. This examination will be credited for managing cracking. Observed conditions that have the potential for impacting the intended function are evaluated or corrected in accordance with the corrective action process. The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program is described in Appendix B.

3. Cracking due to SCC and IGSCC could occur in steel and stainless steel BWR isolation condenser components. The existing program relies on control of reactor water chemistry to mitigate SCC and on ASME Section XI inservice inspection (ISI). However, the existing program should be augmented to detect cracking due to SCC and cyclic loading or loss of material due to pitting and crevice corrosion. The GALL report recommends an augmented program to include temperature and radioactivity monitoring of the shell-side water, and eddy current testing of tubes to ensure that the component’s intended function will be maintained during the period of extended operation.

   Oyster Creek will use the Water Chemistry program, B.1.2, to manage aging of stainless steel tube side components of the Isolation Condenser System exposed to reactor coolant. The program activities provide for monitoring and controlling of water chemistry using station procedures and processes for the prevention or mitigation of cracking due stress corrosion cracking and IGSCC. The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program, B.1.1, will be used with the Water Chemistry Program to manage the aging effects of stress corrosion cracking and IGSCC. The ASME Section XI Inservice Inspection Program will be enhanced to perform inspection of the isolation condenser tube side components, including temperature and radioactivity monitoring of the shell-side water, eddy current testing of the tubes, and inspection (VT or UT) of the tubesheet and channel head to ensure that significant degradation is not occurring and the component intended function will be maintained during the extended period of operation.

Observed conditions that have the potential for impacting the intended function are evaluated or corrected in accordance with the corrective action process. The Water Chemistry program and the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program are described in Appendix B.

3.1.2.2.5 Crack Growth due to Cyclic Loading (PWR)

This is applicable to PWRs only.

3.1.2.2.6 Loss of Fracture Toughness due to Neutron Irradiation Embrittlement and Void Swelling (PWR)

This is applicable to PWRs only.

3.1.2.2.7 Cracking due to Stress Corrosion Cracking (PWR)

This is applicable to PWRs only.

3.1.2.2.8 Cracking due to Cyclic Loading (BWR)

Cracking due to cyclic loading could occur in the stainless steel BWR jet pump sensing lines. The GALL report recommends that a plant specific aging management program be evaluated to mitigate or detect cracking due to line

This item is not applicable to Oyster Creek. Oyster Creek does not have jet pumps or jet pump sensing lines.

3.1.2.2.9 Loss of Preload due to Stress Relaxation (PWR)

This is applicable to PWRs only.

3.1.2.2.10 Loss of Material due to Erosion (PWR)

This is applicable to PWRs only.

3.1.2.2.11 Cracking due to Flow-Induced Vibration (BWR)

Cracking due to flow-induced vibration could occur for the BWR stainless steel steam dryers. The GALL report recommends further evaluation of a plant-specific aging management program to ensure that this aging effect is adequately managed.

Oyster Creek will use the Reactor Internals program, B.1.9, to manage to the effects of cracking of the steam dryer. Oyster Creek will implement the guidelines of BWRVIP-135 for the steam dryer when issued. Observed conditions that have the potential for impacting the intended function are evaluated or corrected in accordance with the corrective action process. The Reactor Internals program is described in Appendix B.

3.1.2.2.12 Cracking due to Thermal and Mechanical Loading (BWR/PWR)

Cracking due to thermal and mechanical loading could occur in Class 1 small-bore steel (BWR), steel with stainless steel cladding, and stainless steel reactor coolant system and connected system piping less than NPS 4. The existing program relies on ASME Section XI ISI to manage cracking due to thermal and mechanical loading. However, Inservice Inspection for Class 1 components Inspection in accordance with ASME Section XI does not require volumetric examination of pipes less than NPS 4. Therefore, a plant-specific destructive examination or a nondestructive examination (NDE) that permits inspection of the inside surfaces of the piping is to be conducted to ensure that cracking has not occurred and the component intended function will be maintained during the extended period of operation. A one-time inspection of a sample of locations is an acceptable method to ensure that the aging effect is not occurring and the component's intended function will be maintained during the period of extended operation.

Oyster Creek will use the ASME Section XI, Inservice Inspection, Subsections IWB, IWC, and IWD program, B.1.1 to mitigate cracking due to thermal and mechanical loading of steel and stainless steel piping, piping components, fittings and branch connections exposed to reactor coolant within the RCPB, including those components in Core Spray, the Reactor Recirculation, Shutdown Cooling, Control Rod Drive, Feedwater, Main Steam, Standby Liquid Control, Nuclear Boiler Instrumentation, Post-Accident Sampling System, Reactor Head Cooling System, Reactor Water Cleanup, and Isolation Condenser Systems. Oyster Creek will also use The One-Time Inspection program, B.1.24, to verify that service-induced weld cracking is not occurring in the small-bore piping less than NPS 4, including pipe, fittings, and branch connections. The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD programs will also be used for Class 1 steel pipe, fittings, and branch connections that are greater than or equal to NPS 4 to verify stress corrosion cracking is not occurring and to ensure the component intended function will be maintained during the extended period of operation.

Observed conditions that have the potential for impacting the intended function are evaluated or corrected in accordance with the corrective action process. The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program and the One-Time Inspection program are described in Appendix B.

3.1.2.2.13 Cracking due to Primary Water Stress Corrosion Cracking (PWR)

This is applicable to PWRs only.

3.1.2.2.14 Wall Thinning due to Flow-accelerated Corrosion (PWR)

This is applicable to PWRs only.

3.1.2.2.15 Changes in Dimensions due to Void Swelling (PWR)

This is applicable to PWRs only.

3.1.2.2.16 Cracking Due to Stress Corrosion Cracking and Primary Water Stress Corrosion Cracking PWR)

This is applicable to PWRs only.

3.1.2.2.17 Cracking due to Stress Corrosion Cracking, Primary Water Stress Corrosion Cracking, and Irradiation-Assisted Stress Corrosion Cracking (PWR)

This is applicable to PWRs only.

3.1.2.2.18 Cracking due to Stress Corrosion Cracking and Irradiation-Assisted Stress Corrosion Cracking (PWR)

This is applicable to PWRs only.

3.1.2.3 Time-Limited Aging Analysis

The time-limited aging analyses identified below are associated with the Reactor Vessel, Internals and Reactor Coolant System components:

- Section 4.2, Neutron Embrittlement of the Reactor Vessel and Internals
- Section 4.3, Metal Fatigue Analysis

3.1.3 CONCLUSION

The Reactor Vessel, Internals, and Reactor Coolant System piping, fittings, and components that are subject to aging management review have been identified in accordance with the requirements of 10 CFR 54.4. The aging management programs selected to manage aging effects for the Reactor Vessel, Internals, and Reactor Coolant System components are identified in the summaries in Section 3.1.2.1 above.

A description of these aging management programs is provided in Appendix B, along with the demonstration that the identified aging effects will be managed for the period of extended operation.

Therefore, based on the conclusions provided in Appendix B, the effects of aging associated with the Reactor Vessel, Internals, and Reactor Coolant System components will be adequately managed so that there is reasonable assurance that the intended function(s) will be maintained consistent with the current licensing basis during the period of extended operation.

Table 3.1.1 Summary of Aging Management Evaluations for the Reactor Vessel, Internals, and Reactor Coolant System

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.1.1-1	Reactor coolant pressure boundary closure bolting, head closure studs, support skirts and attachment welds, pressurizer relief tank components, steam generator components, and reactor vessel internals	Cumulative fatigue damage	TLAA, evaluated in accordance with 10 CFR 54.21(c)	Yes, TLAA	Fatigue is a TLAA; further evaluation is documented in Subsection 3.1.2.2.1.
3.1.1-2	Reactor coolant pressure boundary components, steam generator tubes and sleeves, reactor vessel internals, pressurizer components	Cumulative fatigue damage	TLAA, evaluated in accordance with 10 CFR 54.21(c) and environmental effects are to be addressed for Class 1 components	Yes, TLAA	(Fatigue is a TLAA; further evaluation is documented in Subsection 3.1.2.2.1.
3.1.1-3	Pump and valve closure bolting	Cumulative fatigue damage	TLAA, evaluated in accordance with 10 CFR 54.21(c) check Code limits for allowable cycles (less than 7000 cycles) of thermal stress range	Yes, TLAA	Fatigue is a TLAA; further evaluation is documented in Subsection 3.1.2.2.1.
3.1.1-4	PWR Only				

Table 3.1.1 Summary of Aging Management Evaluations for the Reactor Vessel, Internals, and Reactor Coolant System

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.1.1-5	Stainless steel; steel isolation condenser tube side components exposed to reactor coolant	Loss of material due to general (steel only), pitting and crevice corrosion	Inservice inspection, water chemistry, and plant-specific verification program	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801 with exceptions. The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program, B.1.1will be used with the Water Chemistry program, B.1.2, to manage the loss of material in the stainless steel tube side component of the isolation condensers. The ASME Section XI Inservice Inspection program will be enhanced to included inspections recommended in NUREG-1801. Exceptions apply to the NUREG-1801 recommendations for the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD and Water Chemistry program implementation. See subsection 3.1.2.2.2.2
3.1.1-6	Reactor vessel beltline shell, nozzles, and welds	Loss of fracture toughness due to neutron irradiation embrittlement	TLAA, evaluated in accordance with Appendix G of 10 CFR 50 and RG 1.99. The applicant may choose to demonstrate that the materials of the nozzles are not controlling for the TLAA evaluations.	Yes, TLAA	Consistent with NUREG-1801. Loss of Fracture Toughness for the reactor vessel beltline shell, and welds is addressed as a TLAA in section 4.2. See subsection 3.1.2.2.3.1

Table 3.1.1 Summary of Aging Management Evaluations for the Reactor Vessel, Internals, and Reactor Coolant System

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.1.1-7	Reactor vessel beltline shell, nozzles, and welds; safety injection nozzles	Loss of fracture toughness due to neutron irradiation embrittlement	Reactor vessel surveillance	Yes, plant specific	Consistent with NUREG-1801.The loss of fracture toughness due to neutron irradiation embrittlement of the Reactor vessel beltline shell, and welds will be managed by Reactor Vessel Surveillance program, B.1.23. (See subsection 3.1.2.2.3.2)
3.1.1-8	PWR Only				
3.1.1-9	Steel and stainless steel Class 1 piping, fittings and branch connections < NPS 4 exposed to reactor coolant	Cracking due to Stress corrosion cracking and intergranular stress corrosion cracking	Inservice Inspection, Water chemistry, and a plant specific examination	Yes, parameters monitored/inspected and detection of aging effects are to be evaluated	The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program, B.1.1will be used with the Water Chemistry program, B.1.2, to manage the stress corrosion cracking Steel and stainless steel Class 1 piping, fittings exposed to reactor coolant. The One-Time Inspection program, B.1.24, will be used to verify that service-induced weld cracking is not occurring in the small-bore piping less than NPS 4, including pipe, fittings, and branch connections as recommended in NUREG-01. See subsection 3.1.2.2.4.1

Table 3.1.1 Summary of Aging Management Evaluations for the Reactor Vessel, Internals, and Reactor Coolant System

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.1.1-10	Stainless steel and nickel alloy reactor vessel flange leak detection line	Cracking due to Stress corrosion cracking and intergranular stress corrosion cracking	A plant-specific aging management program is to be evaluated because existing programs may not be capable of mitigating or detecting crack initiation and growth due to SCC in the vessel flange leak detection line.	Yes, plant specific	The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program, B.1.1, will be used to manage the effects of stress corrosion cracking in the stainless steel vessel flange leak detection line. See subsection 3.1.2.2.4.2
3.1.1-11	Stainless steel; steel isolation condenser tube side components exposed to reactor coolant	Cracking due to Stress corrosion cracking and intergranular stress corrosion cracking	Inservice inspection, water chemistry, and plant-specific verification program	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801 with exceptions. The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program, B.1.1will be used with the Water Chemistry program, B.1.2, to manage the cracking in the stainless steel tube side component of the isolation condensers. The ASME Section XI Inservice Inspection program will be enhanced to include inspections recommended in NUREG-1801. Exceptions apply to the NUREG-1801 recommendations for the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD and Water Chemistry program implementation. See subsection 3.1.2.2.4.3
3.1.1-12	PWR Only				

Table 3.1.1 Summary of Aging Management Evaluations for the Reactor Vessel, Internals, and Reactor Coolant System

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.1.1-13	PWR Only				
3.1.1-14	PWR Only				
3.1.1-15	PWR Only				
3.1.1-16	PWR Only				
3.1.1-17	Stainless steel jet pump sensing line	Cracking due to cyclic loading	Plant specific	Yes, plant specific	Not Applicable. Oyster Creek does not have jet pumps or jet pump sensing lines. (See subsection 3.1.2.2.8)
3.1.1-18	PWR Only				
3.1.1-19	PWR Only				
3.1.1-20	Stainless steel steam dryers exposed to reactor coolant	Cracking due to flow-induced vibration	Plant specific	Yes, plant specific	Oyster Creek will use the Reactor Internals program, B.1.9, to manage to the effects of cracking of the steam dryer. Oyster Creek will implement the guidelines of BWRVIP-135 for the steam dryer when issued. See subsection 3.1.2.2.11

Table 3.1.1 Summary of Aging Management Evaluations for the Reactor Vessel, Internals, and Reactor Coolant System

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.1.1-21	BWR steel and stainless steel Class 1 piping, fittings and branch connections < NPS 4 exposed to reactor coolant; PWR stainless steel and steel with stainless steel cladding Class 1 piping, fittings and branch connections < NPS 4	Cracking due to thermal and mechanical loading	Inservice Inspection and a plant specific examination (one-time inspection)	Yes, parameters monitored/inspected and detection of aging effects are to be evaluated	The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program, B.1.1, will be used to manage Cracking due to thermal and mechanical loading of Class 1 steel and stainless steel piping, piping components, and fittings exposed to reactor coolant. In addition the One-Time Inspection will also be used to verify that service induced weld cracking is not occurring in small bore piping less than NPS 4. See subsection 3.1.2.2.12
3.1.1-22	PWR Only				
3.1.1-23	PWR Only				
3.1.1-24	PWR Only				
3.1.1-25	PWR Only				
3.1.1-26	PWR Only				
3.1.1-27	PWR Only				
3.1.1-28	PWR Only				
3.1.1-29	PWR Only				

Table 3.1.1 Summary of Aging Management Evaluations for the Reactor Vessel, Internals, and Reactor Coolant System

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.1.1-30	PWR Only				
3.1.1-31	Stainless steel and nickel alloy penetrations for control rod drive stub tubes instrumentation, jet pump instrument, standby liquid control, flux monitor, and drain line exposed to reactor coolant	Cracking due to stress corrosion cracking, Intergranular stress corrosion cracking, cyclic loading	BWR penetrations and water chemistry	No	The Water Chemistry program, B.1.2, to manage stress corrosion cracking in the nickel alloy Standby Liquid Control and Incore Instrumentation penetrations exposed to reactor coolant. Inspections performed as part of the BWR Vessel Penetration Program, B.1.8, will be used to verify the effectiveness of the Water Chemistry program. The stainless steel control rod stubs and incore flux monitoring housings are managed by the BWR Reactor Internals program, B.1.9, evaluated in item 3.1.1-35.

Table 3.1.1 Summary of Aging Management Evaluations for the Reactor Vessel, Internals, and Reactor Coolant System

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.1.1-32	Stainless steel, cast austenitic stainless steel, and nickel alloy piping, piping components, and piping elements greater than or equal to 4 NPS; nozzle safe ends and associated welds	Cracking due to Stress corrosion cracking and intergranular stress corrosion cracking	BWR Stress Corrosion Cracking and Water Chemistry	No	The Water Chemistry program, B.1.2, and the BWR Stress Corrosion Cracking program, B.1.7, will be used to manage stress corrosion cracking of stainless steel and cast austenitic stainless steel components greater than 4 NPS, including the reactor vessel safe ends and associated welds. The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program, B.1.1, will be used in addition to the Water Chemistry and BWR Stress Corrosion Cracking programs to manage cracking due to stress corrosion cracking and intergranular stress corrosion cracking. Cracking in CRD Return Line nozzle and Feedwater nozzle thermal sleeves is managed by the CRD Nozzle, B.1.6, and the Feedwater Nozzle, B.1.5, programs in conjunction with the Water Chemistry program.

Table 3.1.1 Summary of Aging Management Evaluations for the Reactor Vessel, Internals, and Reactor Coolant System

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.1.1-33	Stainless steel, nickel alloy vessel shell attachment welds exposed to reactor coolant	Cracking due to Stress corrosion cracking and intergranular stress corrosion cracking	BWR vessel ID attachment welds and water chemistry	No	Consistent with NUREG-1801, with exceptions. The Water Chemistry program, B.1.2, and the Attachment Welds program, B.1.4, will be used to manage stress corrosion cracking in the nickel alloy vessel shell attachment welds exposed to reactor coolant. The program activities provide for monitoring and controlling of water chemistry for the prevention or mitigation of aging effects. Exceptions apply to the NUREG-1801 recommendations for Water Chemistry and BWR Vessel ID Attachment Welds program implementation.
3.1.1-34	Stainless steel fuel supports and control rod drive assemblies control rod drive housing exposed to reactor coolant	Cracking due to Stress corrosion cracking and intergranular stress corrosion cracking	BWR vessel internals and water chemistry	No	Consistent with NUREG-1801, with exceptions. The Water Chemistry program, B.1.2, and the BWR Reactor Internals program, B.1.9, will be used to manage stress corrosion cracking in the stainless steel control rod drive housings and fuel supports exposed to reactor coolant. Exceptions apply to the NUREG-1801 recommendations for Water Chemistry program implementation.

Table 3.1.1 Summary of Aging Management Evaluations for the Reactor Vessel, Internals, and Reactor Coolant System

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.1.1-35	Stainless steel, cast austenitic stainless steel, nickel alloy core shroud, core plate, core plate bolts, support structure, top guide, core spray lines, spargers, jet pump assemblies, control rod drive housing, nuclear instrumentation guide tubes	Cracking due to stress corrosion cracking, intergranular stress corrosion cracking, irradiation-assisted stress corrosion cracking	BWR vessel internals and water chemistry	No	Consistent with NUREG-1801, with exceptions. The Water Chemistry program, B.1.2, used to manage cracking due to stress corrosion cracking, intergranular stress corrosion cracking, irradiation-assisted stress corrosion cracking in the stainless steel core shroud, core plate, core plate bolts, support structure, top guide, core spray lines and sparger, control rod drive housing, nuclear instrumentation guide tubes, and repair hardware exposed to reactor coolant. Inspections performed as part of the BWR Reactor Internals program, B.1.9, will be used to verify the effectiveness of the Water Chemistry program. Exceptions apply to the NUREG-1801 recommendations for the Water Chemistry and BWR Reactor Internals program implementation.
3.1.1-36	Steel (with or without stainless steel cladding) control rod drive return line nozzles exposed to reactor coolant	Cracking due to cyclic loading	CRD return line nozzle	No	Consistent with NUREG-1801with exceptions. The BWR Control Rod Drive Return Line Nozzle program, B.1.6, will be used to manage cracking due to cyclic loading of the CRD return line nozzle. Exceptions apply to the NUREG-1801 recommendations for the BWR Control Rod Drive Return Line program implementation.

Table 3.1.1 Summary of Aging Management Evaluations for the Reactor Vessel, Internals, and Reactor Coolant System

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.1.1-37	Steel (with or without stainless steel cladding) feedwater nozzles exposed to reactor coolant	Cracking due to cyclic loading	Feedwater nozzle	No	Consistent with NUREG-1801 with exceptions. The BWR Feedwater Nozzle program, B.1.5, will be used to manage cracking due to cyclic loading of the feedwater nozzle. Exceptions apply to the NUREG-1801 recommendations for the BWR Feedwater Nozzle program implementation.
3.1.1-38	Steel piping, piping components, and piping elements exposed to reactor coolant	Wall thinning due to flow-accelerated corrosion	Flow-accelerated corrosion	No	Consistent with NUREG-1801. The Flow-Accelerated Corrosion program, B.1.11, will be used to manage wall thinning due to flow-accelerated corrosion on Steel piping, piping components, and piping elements exposed to reactor coolant. This includes piping and piping components in the Main Steam and Feedwater systems.
3.1.1-39	Nickel alloy core shroud and core plate access hole cover (welded and mechanical covers)	Cracking due to stress corrosion cracking, intergranular stress corrosion cracking, irradiation-assisted stress corrosion cracking	Inservice inspection and water chemistry	No	This line item is not used for Oyster Creek because Oyster Creek does not have access holes or hole covers in the shroud support plate.
3.1.1-40	Steel top head enclosure (without cladding) top head nozzles (vent, top head spray or RCIC, and spare) exposed to reactor coolant	Loss of material due to general, pitting and crevice corrosion	Inservice inspection and water chemistry	No	The Oyster Creek top head enclosure is clad with stainless steel and not subject to loss of material from general, pitting and crevice corrosion. No aging program is required.

Table 3.1.1 Summary of Aging Management Evaluations for the Reactor Vessel, Internals, and Reactor Coolant System

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.1.1-41	Nickel alloy core shroud and core plate access hole cover (welded and mechanical covers)	Cracking due to stress corrosion cracking, intergranular stress corrosion cracking, irradiation-assisted stress corrosion cracking	Inservice inspection, water chemistry, and augmented inspection of the access hole cover welds	No	This line item is not used for Oyster Creek, because Oyster Creek does not have access holes or hole covers in the shroud support plate.
3.1.1-42	High-strength low alloy steel top head closure studs and nuts exposed to air with reactor coolant leakage	Cracking due to Stress corrosion cracking and intergranular stress corrosion cracking	Reactor head closure studs	No	Consistent with NUREG-1801 with exceptions. The Reactor Head Closure Studs program, B.1.3, will be used to manage cracking in the high-strength low alloy steel top head closure studs due to Stress corrosion cracking and intergranular stress corrosion cracking. Exceptions apply to the NUREG-1801 recommendations for the Reactor Head Closure Studs program implementation.
3.1.1-43	Jet pump assembly castings; orificed fuel support	Loss of fracture toughness due to thermal aging and neutron irradiation embrittlement	Thermal aging and neutron irradiation embrittlement	No	Consistent with NUREG-1801. The Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS) program, B.1.10 will be used to manage loss of fracture toughness due to thermal aging and neutron irradiation embrittlement for fuel support assemblies, control rod guide tube base castings, and the core spray nozzle elbows. The components are constructed of CASS and are exposed to reactor coolant and high neutron flux. This line item is not applied to jet pumps because Oyster Creek does not have jet pumps.

Table 3.1.1 Summary of Aging Management Evaluations for the Reactor Vessel, Internals, and Reactor Coolant System

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.1.1-44	Reactor coolant pressure boundary (RCPB) valve closure bolting, manway and holding bolting, and closure bolting in high-pressure and high-temperature systems	Cracking due to stress corrosion cracking, loss of material due to wear, loss of preload due to stress relaxation	Bolting Integrity	No	Consistent with NUREG-1801 with exceptions. The Bolting Integrity program, B.1.12, will be used to manage loss of material due to wear and loss of preload due to stress relaxation for bolting used on closure bolting for components in the RCPB. Exceptions apply to the NUREG-1801 recommendations for the Bolting Integrity program implementation.
3.1.1-45	Copper alloy piping, piping components, and piping elements exposed to closed cycle cooling water	Loss of material due to pitting, crevice, and galvanic corrosion	Closed-cycle cooling water system and One-Time Inspection	No	Not Applicable. Oyster Creek has no copper alloy piping, piping components, or piping elements exposed to a closed cycle cooling water environment in the Reactor Vessel, Internals, or Reactor Coolant System.
3.1.1-46	Steel piping, piping components, and piping elements exposed to closed cycle cooling water	Loss of material due to general, pitting and crevice corrosion	Closed-cycle cooling water system and One-Time Inspection	No	Not Applicable. Oyster Creek has no stainless steel piping, piping components, or piping elements exposed to a closed cycle cooling water environment in the Reactor Vessel, Internals, or Reactor Coolant System.

Table 3.1.1 Summary of Aging Management Evaluations for the Reactor Vessel, Internals, and Reactor Coolant System

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.1.1-47	Cast austenitic stainless steel Class 1 pump casings, and valve bodies and bonnets exposed to reactor coolant >250°C (>482°F)	Loss of fracture toughness due to thermal aging embrittlement	Inservice inspection. Thermal aging susceptibility screening is not necessary, inservice inspection requirements are sufficient for managing these aging effects. ASME Code Case N-481 also provides an alternative for pump casings.	No	Consistent with NUREG-1801 with exceptions. The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program, B.1.1, will be used to manage loss of fracture toughness due to thermal aging embrittlement in Class 1 pump casing and valve bodies exposed to exposed to reactor coolant >482F. This line item applies to components in the Reactor Recirculation, Reactor Water cleanup, and Isolation Condenser systems. Exceptions apply to the NUREG-1801 recommendations for the ASME Section XI Inservice Inspection program implementation.
3.1.1-48	Copper alloy >15% Zn piping, piping components, and piping elements exposed to closed cycle cooling water	Loss of material due to selective leaching	Selective Leaching of Materials	No	Not Applicable. Oyster Creek has no copper alloy >15% Zn piping, piping components, or piping elements exposed to a closed cycle cooling water environment in the Reactor Vessel, Internals, or Reactor Coolant System.
3.1.1-49	Cast austenitic stainless steel piping and CRD pressure housings	Loss of fracture toughness due to thermal aging embrittlement	Thermal aging embrittlement of CASS	No	Not applicable. Oyster Creek does not have cast austenitic stainless steel piping that is subject to loss of fracture toughness due to thermal aging embrittlement. Aging of the core spray sparger spray nozzle is evaluated in line item 3.1.1-43.
3.1.1-50	PWR only				
3.1.1-51	PWR only				

Table 3.1.1 Summary of Aging Management Evaluations for the Reactor Vessel, Internals, and Reactor Coolant System

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.1.1-52	PWR only				
3.1.1-53	PWR only				
3.1.1-54	PWR only				
3.1.1-55	PWR only				
3.1.1-56	PWR only				
3.1.1-57	PWR only				
3.1.1-58	PWR only				
3.1.1-59	PWR only				
3.1.1-60	PWR only				
3.1.1-61	PWR Only				
3.1.1-62	PWR Only				
3.1.1-63	PWR Only				

Table 3.1.1 Summary of Aging Management Evaluations for the Reactor Vessel, Internals, and Reactor Coolant System

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.1.1-64	PWR Only				
3.1.1-65	PWR Only				
3.1.1-66	PWR Only				
3.1.1-67	PWR Only				
3.1.1-68	PWR Only				
3.1.1-69	PWR Only				
3.1.1-70	Stainless steel piping, piping components, and piping elements exposed to air with borated water leakage or gas	None	None	NA - No AEM or AMP	Not Applicable. Oyster Creek has no steel or stainless steel piping, piping components, or piping elements exposed to air with borated water leakage or gas.
3.1.1-71	Stainless steel, cast austenitic 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.
3.1.1-72	Steel and stainless steel piping, piping components, and piping elements in concrete	None	None	NA - No AEM or AMP	Not Applicable. Oyster Creek has no steel or stainless steel piping, piping components, or piping elements in concrete in the RCPB.

Table 3.1.1 Summary of Aging Management Evaluations for the Reactor Vessel, Internals, and Reactor Coolant System

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.1.1-73	PWR Only				

Table 3.1.2.1.1
Isolation Condenser System
Summary of Aging Management Evaluation

Table 3.1.2.1.1 Isolation Condenser System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bird Screen	Filter	Carbon and low alloy steel	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.E-8 (E-45)	3.2.1-2	E
Closure bolting	Mechanical Closure	Alloy Steel	Indoor Air (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
						V.E-4 (EP-25)	3.2.1-25	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B
						V.E-5 (EP-24)	3.2.1-25	B, 10
		Carbon and low alloy steel	Indoor Air (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B

Table 3.1.2.1.1 Isolation Condenser System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	V.E-4 (EP-25)	3.2.1-25	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B
						V.E-5 (EP-24)	3.2.1-25	B, 10
		Stainless Steel	Containment Atmosphere (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C2-11 (R-18)	3.1.1-1	A, 3
				Loss Of Preload	Bolting Integrity (B.1.12)			G
			Indoor Air (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C2-11 (R-18)	3.1.1-1	A, 3
				Loss Of Preload	Bolting Integrity (B.1.12)			G
Gauge Snubber	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E

Table 3.1.2.1.1 Isolation Condenser System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchangers (isolation condensers)	Heat Transfer	Stainless Steel (Tubes)	Treated Water (Internal)	Reduction of Heat Transfer	Water Chemistry (B.1.2)	V.D2-10 (EP-34)	3.2.1-24	B
			Treated Water < 140F (External)	Reduction of Heat Transfer	Water Chemistry (B.1.2)	V.D2-10 (EP-34)	3.2.1-24	B
	Pressure Boundary	Carbon and low alloy steel (Shell Side Components)	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.D2-2 (E-26)	3.2.1-2	E
			Indoor Air (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-13 (E-29)	3.2.1-2	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.E-3 (S-18)	3.4.1-2	A
					Water Chemistry (B.1.2)	VIII.E-3 (S-18)	3.4.1-2	B
		Stainless Steel (Tube Side Components)	Indoor Air (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	C, 9
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-5 (R-15)	3.1.1-11	B, 8

Table 3.1.2.1.1 Isolation Condenser System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchangers (isolation condensers)	Pressure Boundary	Stainless Steel (Tubes and Tube Side Components)	Treated Water (Internal)	Cracking Initiation and Growth	Water Chemistry (B.1.2)	IV.C1-5 (R-15)	3.1.1-11	B, 8
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	C, 8
				Loss of Material	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-6 (R-16)	3.1.1-5	B, 8
					Water Chemistry (B.1.2)	IV.C1-6 (R-16)	3.1.1-5	B, 8
			Treated Water < 140F (External)	Loss of Material	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	V.D2-23 (EP-32)	3.2.1-3	E, 1
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.D2-2 (E-26)	3.2.1-2	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-27 (E-08)	3.2.1-10	A
					Water Chemistry (B.1.2)	V.D2-27 (E-08)	3.2.1-10	B

Table 3.1.2.1.1 Isolation Condenser System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.D2-2 (E-26)	3.2.1-2	E
			Indoor Air (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-13 (E-29)	3.2.1-2	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.E-8 (E-45)	3.2.1-2	E
			Treated Water <140F (Internal)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	V.D2-26 (E-10)	3.2.1-1	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-27 (E-08)	3.2.1-10	A
					Water Chemistry (B.1.2)	V.D2-27 (E-08)	3.2.1-10	B, 11
		Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A

Table 3.1.2.1.1 Isolation Condenser System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Steam (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-1 (R-03)	3.1.1-9	B, 4
						IV.C1-2 (R-55)	3.1.1-21	B, 4
						IV.C1-9 (R-22)	3.1.1-32	E, 4, 6
					BWR Stress Corrosion Cracking (B.1.7)	IV.C1-9 (R-22)	3.1.1-32	B, 4
					One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	A, 4
						IV.C1-2 (R-55)	3.1.1-21	A, 4
						VIII.B2-1 (SP-45)	3.4.1-8	A, 4
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	B, 4

Table 3.1.2.1.1 Isolation Condenser System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Steam (Internal)	Cracking Initiation and Growth	Water Chemistry (B.1.2)	IV.C1-9 (R-22)	3.1.1-32	B, 4
						VIII.B2-1 (SP-45)	3.4.1-8	B, 4
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A, 4
						V.D2-22 (E-16)	3.2.1-1	A, 4
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E, 4
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E, 4
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-1 (R-03)	3.1.1-9	B
						IV.C1-2 (R-55)	3.1.1-21	B
						IV.C1-9 (R-22)	3.1.1-32	E, 6

Table 3.1.2.1.1 Isolation Condenser System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking Initiation and Growth	BWR Stress Corrosion Cracking (B.1.7)	IV.C1-9 (R-22)	3.1.1-32	B
					One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	A
						IV.C1-2 (R-55)	3.1.1-21	A
						VIII.E-25 (SP-19)	3.4.1-8	A
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	B
						IV.C1-9 (R-22)	3.1.1-32	B
						VIII.E-25 (SP-19)	3.4.1-8	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
						V.D2-22 (E-16)	3.2.1-1	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E

Table 3.1.2.1.1 Isolation Condenser System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
Thermowell	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.D2-2 (E-26)	3.2.1-2	E
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-27 (E-08)	3.2.1-10	A
					Water Chemistry (B.1.2)	V.D2-27 (E-08)	3.2.1-10	B
		Stainless Steel	Indoor Air (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Treated Water (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	E, 2, 7
						IV.C1-2 (R-55)	3.1.1-21	E, 2, 7
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	E, 2, 7
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E

Table 3.1.2.1.1 Isolation Condenser System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Thermowell	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
Valve Body	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.D2-2 (E-26)	3.2.1-2	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-27 (E-08)	3.2.1-10	A
					Water Chemistry (B.1.2)	V.D2-27 (E-08)	3.2.1-10	B
		Stainless Steel	Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.D2-2 (E-26)	3.2.1-2	E
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-27 (E-08)	3.2.1-10	A
					Water Chemistry (B.1.2)	V.D2-27 (E-08)	3.2.1-10	B

Table 3.1.2.1.1 Isolation Condenser System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	CASS	Containment Atmosphere (External)	None	None	IV.E-1 (RP-02)	3.1.1-71	A
			Indoor Air (External)	None	None	IV.E-1 (RP-02)	3.1.1-71	A
			Steam (Internal)	Cracking Initiation and Growth	BWR Stress Corrosion Cracking (B.1.7)	IV.C1-10 (R-20)	3.1.1-32	B, 4
					Water Chemistry (B.1.2)	IV.C1-10 (R-20)	3.1.1-32	B, 4
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A, 4
				Loss of Fracture Toughness	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-4 (R-08)	3.1.1-47	B, 4
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E, 4, 5
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E, 4, 5
			Treated Water (Internal)	Cracking Initiation and Growth	BWR Stress Corrosion Cracking (B.1.7)	IV.C1-10 (R-20)	3.1.1-32	B
					Water Chemistry (B.1.2)	IV.C1-10 (R-20)	3.1.1-32	B

Table 3.1.2.1.1 Isolation Condenser System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	CASS	Treated Water (Internal)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E, 5
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E, 5
		Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Indoor Air (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Steam (Internal)	Cracking Initiation and Growth	BWR Stress Corrosion Cracking (B.1.7)	IV.C1-9 (R-22)	3.1.1-32	B, 4
					One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	E, 2, 4, 7
						IV.C1-2 (R-55)	3.1.1-21	E, 2, 4, 7
						VIII.B2-1 (SP-45)	3.4.1-8	A, 4
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	E, 2, 4, 7

Table 3.1.2.1.1 Isolation Condenser System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Stainless Steel	Steam (Internal)	Cracking Initiation and Growth	Water Chemistry (B.1.2)	IV.C1-9 (R-22)	3.1.1-32	B, 4
						VIII.B2-1 (SP-45)	3.4.1-8	B, 4
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A, 4
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E, 4
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E, 4
			Treated Water (Internal)	Cracking Initiation and Growth	BWR Stress Corrosion Cracking (B.1.7)	IV.C1-9 (R-22)	3.1.1-32	B
					One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	E, 2, 7
						IV.C1-2 (R-55)	3.1.1-21	E, 2, 7
						VIII.E-25 (SP-19)	3.4.1-8	A
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	E, 2, 7

Table 3.1.2.1.1 Isolation Condenser System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking Initiation and Growth	Water Chemistry (B.1.2)	IV.C1-9 (R-22)	3.1.1-32	B
						VIII.E-25 (SP-19)	3.4.1-8	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. This Aging Effect for the isolation condenser is addressed by the Aging Management Program, "ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD", as enhanced by the inspection and verification requirements from NUREG-1801.
2. ASME XI Inservice Inspection, Subsections IWB, IWC, and IWD does not apply to cracking of these items.
3. Cumulative Fatigue Damage (TLAA) is not included in NUREG-1801 as an aging effect for stainless steel bolting in BWRs. The bolting fatigue issue is addressed by TLAA, evaluated in accordance with 10CFR54.21(c).
4. The environment of steam is considered similar to the environments of reactor coolant or treated water for evaluation of this component and material, consistent with the environment definitions in NUREG-1801 Chapter IX.
5. CASS material for this item is a subset of "Stainless Steel" for this Aging Effect.
6. The program for ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD is applied in addition to the NUREG-1801 specified programs for this item.
7. The applicable Aging Management Programs recommended in NUREG-1801 for Class 1 carbon and stainless steel piping, fittings, and branch connections < 4 in. NPS are also specified here for Class 1 valve bodies and other components < 4 in. NPS.
8. The reactor coolant environment of Treated Water (Internal) applies to the isolation condenser tube side piping, including supply and return piping, as this loop is connected to reactor coolant pressure boundary piping.

9. Indoor Air (External) environment applies to the isolation condenser tube side channel head.
10. Line item IV.C1-12 (R-27) for loss of preload for RCPB closure bolting does not apply since the A 193 B7 alloy steel closure bolting is not high-strength. Line item EP-24 has been applied to the loss of preload aging effect for RCPB closure bolting.
11. Line item IV.C1-7 (R-23) for flow-accelerated corrosion is not an applicable aging mechanism as this is a standby system.

Table 3.1.2.1.2
Nuclear Boiler Instrumentation
Summary of Aging Management Evaluation

Table 3.1.2.1.2 Nuclear Boiler Instrumentation

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Containment Atmosphere (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 4
			Indoor Air (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
						V.E-4 (EP-25)	3.2.1-25	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B
						V.E-5 (EP-24)	3.2.1-25	B, 4

Table 3.1.2.1.2 Nuclear Boiler Instrumentation (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Containment Atmosphere (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 4
			Indoor Air (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
					Bolting Integrity (B.1.12)	V.E-4 (EP-25)	3.2.1-25	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B
					Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 4
		Stainless Steel	Containment Atmosphere (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C2-11 (R-18)	3.1.1-1	A
				Loss Of Preload	Bolting Integrity (B.1.12)			G

Table 3.1.2.1.2 Nuclear Boiler Instrumentation (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Stainless Steel	Indoor Air (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C2-11 (R-18)	3.1.1-1	A
				Loss Of Preload	Bolting Integrity (B.1.12)			G
Condensing chamber	Pressure Boundary	Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A, 3
			Steam (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-1 (R-03)	3.1.1-9	B, 2, 3, 5, 8
						IV.C1-2 (R-55)	3.1.1-21	B, 2, 3, 5, 8
					One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	A, 2, 3, 5
						IV.C1-2 (R-55)	3.1.1-21	A, 2, 3, 5
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	B, 2, 3, 5
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E, 2, 3

Table 3.1.2.1.2 Nuclear Boiler Instrumentation (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Condensing chamber	Pressure Boundary	Stainless Steel	Steam (Internal)	Loss of Material	Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E, 2, 3
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-1 (R-03)	3.1.1-9	B, 3, 5, 8
						IV.C1-2 (R-55)	3.1.1-21	B, 3, 5, 8
					One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	A, 3, 5
						IV.C1-2 (R-55)	3.1.1-21	A, 3, 5
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	B, 3, 5
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A, 3
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E, 3
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E, 3

Table 3.1.2.1.2 Nuclear Boiler Instrumentation (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Gauge Snubber	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
Piping and fittings	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
	Pressure Boundary	Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Indoor Air (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Steam (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-1 (R-03)	3.1.1-9	B, 2

Table 3.1.2.1.2 Nuclear Boiler Instrumentation (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Steam (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-2 (R-55)	3.1.1-21	B, 2
					One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	A, 2
						IV.C1-2 (R-55)	3.1.1-21	A, 2
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	B, 2
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A, 2
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E, 2
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E, 2
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.A1-9 (R-61)	3.1.1-10	E, 7
						IV.C1-1 (R-03)	3.1.1-9	B

Table 3.1.2.1.2 Nuclear Boiler Instrumentation (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-2 (R-55)	3.1.1-21	B
						IV.C1-9 (R-22)	3.1.1-32	E, 1
					BWR Stress Corrosion Cracking (B.1.7)	IV.C1-9 (R-22)	3.1.1-32	B
					One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	A
						IV.C1-2 (R-55)	3.1.1-21	A
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	B
						IV.C1-9 (R-22)	3.1.1-32	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E

Table 3.1.2.1.2 Nuclear Boiler Instrumentation (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
Valve Body	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
	Pressure Boundary	Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Indoor Air (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.A1-9 (R-61)	3.1.1-10	E, 7
					One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	E, 6, 9
						IV.C1-2 (R-55)	3.1.1-21	E, 6, 9
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	E, 6, 9

Table 3.1.2.1.2 Nuclear Boiler Instrumentation (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The program for ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD is applied in addition to the NUREG-1801 specified programs for this item.
2. The environment of steam is considered similar to the environments of reactor coolant or treated water for evaluation of this component and material, consistent with the environment definitions in NUREG-1801 Chapter IX.
3. Temperature Equalizing Columns RE08A and RE08B are included in the Condensing Chamber component type category.
4. Line item IV.C1-12 (R-27) for loss of preload for RCPB closure bolting does not apply since the A 193 B7 alloy steel closure bolting is not high-strength. Line item V.E-5 (EP-24) has been applied to the loss of preload aging effect for RCPB closure bolting.
5. The Aging Management Programs recommended in NUREG-1801 for Class 1 stainless steel piping, fittings, and branch connections < 4 in. N.P.S. are also specified here for Class 1 condensing chambers < 4 in. N.P.S.
6. The applicable Aging Management Programs recommended in NUREG-1801 for Class 1 stainless steel piping, fittings, and branch connections < 4 in. N.P.S. are also specified here for Class 1 valve bodies < 4 in. N.P.S.
7. The Reactor Pressure Vessel flange leak detection line is visually inspected per the ISI program each refueling outage.
8. ASME XI Inservice Inspection, Subsections IWB, IWC, and IWD applies to this item which is comprised of piping < 4 in. N.P.S.
9. ASME XI Inservice Inspection, Subsections IWB, IWC, and IWD does not apply to cracking of valves.

Table 3.1.2.1.3
Reactor Head Cooling System
Summary of Aging Management Evaluation

Table 3.1.2.1.3 Reactor Head Cooling System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Containment Atmosphere (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 2
			Indoor Air (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
						VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 2
						VII.I-5 (AP-26)	3.3.1-35	B

Table 3.1.2.1.3 Reactor Head Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Containment Atmosphere (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 2
			Indoor Air (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
						VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 2
						VII.I-5 (AP-26)	3.3.1-35	B
Flow Element	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A

Table 3.1.2.1.3 Reactor Head Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flow Element	Leakage Boundary	Stainless Steel	Treated Water <140F (Internal)	Loss of Material	Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
	Pressure Boundary	Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Indoor Air (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Steam (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-1 (R-03)	3.1.1-9	B, 1

Table 3.1.2.1.3 Reactor Head Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Steam (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-2 (R-55)	3.1.1-21	B, 1
					One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	A, 1
						IV.C1-2 (R-55)	3.1.1-21	A, 1
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	B, 1
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A, 1
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A, 1
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B, 1
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-1 (R-03)	3.1.1-9	B
						IV.C1-2 (R-55)	3.1.1-21	B

Table 3.1.2.1.3 Reactor Head Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	A
						IV.C1-2 (R-55)	3.1.1-21	A
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
Restricting Orifice	Pressure Boundary	Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Steam (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	E, 1, 4, 5
						IV.C1-2 (R-55)	3.1.1-21	E, 1, 4, 5
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	E, 1, 4, 5

Table 3.1.2.1.3 Reactor Head Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Restricting Orifice	Pressure Boundary	Stainless Steel	Steam (Internal)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A, 1
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A, 1
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B, 1
	Throttle	Stainless Steel	Steam (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	E, 1, 4, 5
						IV.C1-2 (R-55)	3.1.1-21	E, 1, 4, 5
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	E, 1, 4, 5
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A, 1
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A, 1
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B, 1
Valve Body	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E

Table 3.1.2.1.3 Reactor Head Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Leakage Boundary	Carbon and low alloy steel	Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	IV.C1-2 (R-55)	3.1.1-21	E, 4, 5
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B

Table 3.1.2.1.3 Reactor Head Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Carbon and low alloy steel	Treated Water (Internal)	Not Applicable	None	IV.C1-1 (R-03)	3.1.1-9	I, 3, 4
		CASS	Indoor Air (External)	None	None	IV.E-1 (RP-02)	3.1.1-71	A
			Treated Water (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	E, 4, 5
						IV.C1-2 (R-55)	3.1.1-21	E, 4, 5
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	E, 4, 5
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
		Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Treated Water (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	E, 4, 5

Table 3.1.2.1.3 Reactor Head Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	IV.C1-2 (R-55)	3.1.1-21	E, 4, 5
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	E, 4, 5
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The environment of steam is considered similar to the environments of reactor coolant or treated water for evaluation of this component and material, consistent with the environment definitions in NUREG-1801 Chapter IX.
2. NUREG-1801 line item IV.C1-12 (R-27) for loss of preload for RCPB closure bolting does not apply since the A 193 B7 alloy steel closure bolting is not high-strength. Line item V.E-5 (EP-24) has been applied to the loss of preload aging effect for RCPB closure bolting.
3. SCC and IGSCC of carbon and low alloy steel are not considered applicable aging mechanisms in a treated water environment per EPRI Mechanical Tools Appendix A.
4. The applicable programs for the aging effect of cracking as identified in line items IV.C1-1 (R-03) and IV.C1-2 (R-55) for class 1 piping, fittings and branch connections < NPS 4 have been applied to Class 1 components < NPS 4.
5. ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD does not apply to this component.

Table 3.1.2.1.4
Reactor Internals
Summary of Aging Management Evaluation

Table 3.1.2.1.4 Reactor Internals

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Control Rod Drive Assembly (Housing and Guide Tube)	Pressure Boundary	Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Treated Water	Cracking Initiation and Growth	BWR Vessel Internals (B.1.9)	IV.B1-8 (R-104)	3.1.1-34	B
					Water Chemistry (B.1.2)	IV.B1-8 (R-104)	3.1.1-34	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.B1-14 (R-53)	3.1.1-1	A
	Structural Support	CASS	Treated Water >482F (Internal)	Cracking Initiation and Growth	BWR Vessel Internals (B.1.9)	IV.B1-8 (R-104)	3.1.1-34	B, 8
					Water Chemistry (B.1.2)	IV.B1-8 (R-104)	3.1.1-34	B, 8
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.B1-14 (R-53)	3.1.1-1	A

Table 3.1.2.1.4 Reactor Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Control Rod Drive Assembly (Housing and Guide Tube)	Structural Support	CASS	Treated Water >482F (Internal)	Loss of Fracture Toughness	Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS) (B.1.10)	IV.B1-9 (R-103)	3.1.1-43	C
		Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Treated Water	Cracking Initiation and Growth	BWR Vessel Internals (B.1.9)	IV.B1-8 (R-104)	3.1.1-34	B
					Water Chemistry (B.1.2)	IV.B1-8 (R-104)	3.1.1-34	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.B1-14 (R-53)	3.1.1-1	A
Core Plate (Lower Core Grid)	Structural Support	Stainless Steel	Treated Water	Cracking Initiation and Growth	BWR Vessel Internals (B.1.9)	IV.B1-6 (R-93)	3.1.1-35	B
					Water Chemistry (B.1.2)	IV.B1-6 (R-93)	3.1.1-35	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.B1-14 (R-53)	3.1.1-1	A
Core Plate (Lower Core Grid) Wedges	Structural Support	Nickel Alloy	Treated Water	Cracking Initiation and Growth	BWR Vessel Internals (B.1.9)	IV.B1-2 (R-96)	3.1.1-35	D, 2

Table 3.1.2.1.4 Reactor Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Core Plate (Lower Core Grid) Wedges	Structural Support	Nickel Alloy	Treated Water	Cracking Initiation and Growth	Water Chemistry (B.1.2)	IV.B1-2 (R-96)	3.1.1-35	D, 2
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.B1-14 (R-53)	3.1.1-1	A
Core Shroud	Pressure Boundary	Stainless Steel	Treated Water	Cracking Initiation and Growth	BWR Vessel Internals (B.1.9)	IV.B1-1 (R-92)	3.1.1-35	B
					Water Chemistry (B.1.2)	IV.B1-1 (R-92)	3.1.1-35	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.B1-14 (R-53)	3.1.1-1	A
	Structural Support	Stainless Steel	Treated Water	Cracking Initiation and Growth	BWR Vessel Internals (B.1.9)	IV.B1-1 (R-92)	3.1.1-35	B
					Water Chemistry (B.1.2)	IV.B1-1 (R-92)	3.1.1-35	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.B1-14 (R-53)	3.1.1-1	A
Core Spray Line Spray Nozzle Elbows	Pressure Boundary	CASS	Treated Water >482F	Cracking Initiation and Growth	BWR Vessel Internals (B.1.9)	IV.B1-7 (R-99)	3.1.1-35	B, 8
					Water Chemistry (B.1.2)	IV.B1-7 (R-99)	3.1.1-35	B, 8

Table 3.1.2.1.4 Reactor Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Core Spray Line Spray Nozzle Elbows	Pressure Boundary	CASS	Treated Water >482F	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.B1-14 (R-53)	3.1.1-1	A
				Loss of Fracture Toughness	Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS) (B.1.10)	IV.B1-9 (R-103)	3.1.1-43	C
Core Spray Lines, Thermal Sleeves, Spray Rings (Sparger), and Spray Nozzles	Pressure Boundary	Stainless Steel	Treated Water	Cracking Initiation and Growth	BWR Vessel Internals (B.1.9)	IV.B1-7 (R-99)	3.1.1-35	B
					Water Chemistry (B.1.2)	IV.B1-7 (R-99)	3.1.1-35	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.B1-14 (R-53)	3.1.1-1	A
	Spray	Stainless Steel	Treated Water	Cracking Initiation and Growth	BWR Vessel Internals (B.1.9)	IV.B1-7 (R-99)	3.1.1-35	B

Table 3.1.2.1.4 Reactor Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Core Spray Lines, Thermal Sleeves, Spray Rings (Sparger), and Spray Nozzles	Spray	Stainless Steel	Treated Water	Cracking Initiation and Growth	Water Chemistry (B.1.2)	IV.B1-7 (R-99)	3.1.1-35	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.B1-14 (R-53)	3.1.1-1	A
	Structural Support	Stainless Steel	Treated Water	Cracking Initiation and Growth	BWR Vessel Internals (B.1.9)	IV.B1-7 (R-99)	3.1.1-35	B
					Water Chemistry (B.1.2)	IV.B1-7 (R-99)	3.1.1-35	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.B1-14 (R-53)	3.1.1-1	A
Core Spray Ring (Sparger) Repair Hardware	Structural Support	Stainless Steel	Treated Water	Cracking Initiation and Growth	BWR Vessel Internals (B.1.9)	IV.B1-7 (R-99)	3.1.1-35	D, 5

Table 3.1.2.1.4 Reactor Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Core Spray Ring (Sparger) Repair Hardware	Structural Support	Stainless Steel	Treated Water	Cracking Initiation and Growth	Water Chemistry (B.1.2)	IV.B1-7 (R-99)	3.1.1-35	D, 5
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.B1-14 (R-53)	3.1.1-1	A
Fuel Support Piece	Direct Flow	CASS	Treated Water >482F	Cracking Initiation and Growth	BWR Vessel Internals (B.1.9)	IV.B1-8 (R-104)	3.1.1-34	B, 8
					Water Chemistry (B.1.2)	IV.B1-8 (R-104)	3.1.1-34	B, 8
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.B1-14 (R-53)	3.1.1-1	A
				Loss of Fracture Toughness	Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS) (B.1.10)	IV.B1-9 (R-103)	3.1.1-43	A
	Structural Support	CASS	Treated Water >482F (Internal)	Cracking Initiation and Growth	BWR Vessel Internals (B.1.9)	IV.B1-8 (R-104)	3.1.1-34	B, 8
					Water Chemistry (B.1.2)	IV.B1-8 (R-104)	3.1.1-34	B, 8
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.B1-14 (R-53)	3.1.1-1	A

Table 3.1.2.1.4 Reactor Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Fuel Support Piece	Structural Support	CASS	Treated Water >482F (Internal)	Loss of Fracture Toughness	Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS) (B.1.10)	IV.B1-9 (R-103)	3.1.1-43	A
Incore Neutron Monitor Dry Tubes, Guide Tubes & Housings	Pressure Boundary	Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Treated Water	Cracking Initiation and Growth	BWR Vessel Internals (B.1.9)	IV.B1-10 (R-105)	3.1.1-35	B, 3
					Water Chemistry (B.1.2)	IV.B1-10 (R-105)	3.1.1-35	B, 3
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.B1-14 (R-53)	3.1.1-1	A
Shroud Repairs (tie rods and lug/clevis assemblies)	Structural Support	Nickel Alloy	Treated Water	Cracking Initiation and Growth	BWR Vessel Internals (B.1.9)	IV.B1-2 (R-96)	3.1.1-35	D
					Water Chemistry (B.1.2)	IV.B1-2 (R-96)	3.1.1-35	D
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.B1-14 (R-53)	3.1.1-1	A

Table 3.1.2.1.4 Reactor Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Shroud Repairs (tie rods and lug/clevis assemblies)	Structural Support	Stainless Steel	Treated Water	Cracking Initiation and Growth	BWR Vessel Internals (B.1.9)	IV.B1-1 (R-92)	3.1.1-35	B, 4
					Water Chemistry (B.1.2)	IV.B1-1 (R-92)	3.1.1-35	B, 4
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.B1-14 (R-53)	3.1.1-1	A, 4
Shroud Support Structure	Pressure Boundary	Nickel Alloy	Treated Water	Cracking Initiation and Growth	BWR Vessel Internals (B.1.9)	IV.B1-2 (R-96)	3.1.1-35	B
					Water Chemistry (B.1.2)	IV.B1-2 (R-96)	3.1.1-35	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.B1-14 (R-53)	3.1.1-1	A
	Structural Support	Nickel Alloy	Treated Water	Cracking Initiation and Growth	BWR Vessel Internals (B.1.9)	IV.B1-2 (R-96)	3.1.1-35	B
					Water Chemistry (B.1.2)	IV.B1-2 (R-96)	3.1.1-35	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.B1-14 (R-53)	3.1.1-1	A

Table 3.1.2.1.4 Reactor Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Top Guide (Upper Core Grid)	Structural Support	Stainless Steel	Treated Water	Cracking Initiation and Growth	BWR Vessel Internals (B.1.9)	IV.B1-16 (R-98)	3.1.1-35	B, 6
					Water Chemistry (B.1.2)	IV.B1-16 (R-98)	3.1.1-35	B, 6
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.B1-14 (R-53)	3.1.1-1	A
Vessel Steam Dryer	Structural Support	Stainless Steel	Steam	Cracking Initiation and Growth	BWR Vessel Internals (B.1.9)	IV.B1-15 (RP-18)	3.1.1-20	E, 1, 7
					Water Chemistry (B.1.2)	IV.B1-15 (RP-18)	3.1.1-20	E, 1, 7

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The Oyster Creek Vessel Internals program will be enhanced to include inspection of the reactor vessel steam dryer. The program inspection requirements will follow the guidelines of BWRVIP-139 when approved by the NRC.
2. These core plate components are not identified in NUREG-1801 for this reference.
3. Incore neutron monitor dry tubes are periodically replaced and are short lived.
4. Includes the keeper plate, upper bracket, lateral support (bumper), and lower attachment hooks
5. Core spray repair hardware are not identified in NUREG-1801 for this reference.
6. The top guide has exceeded the IASCC threshold. The Oyster Creek Vessel Internals program will be revised to include the additional top guide inspections described in XI.M9 (BWR Vessel Internals).
7. The dryer enivronment includes treated water internally.
8. CASS material for this item is assumed to be a subset of Stainless Steel for this aging effect.

Table 3.1.2.1.5
Reactor Pressure Vessel
Summary of Aging Management Evaluation

Table 3.1.2.1.5 Reactor Pressure Vessel

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Nozzle (Bottom head drain)	Pressure Boundary	Carbon and low alloy steel	Containment Atmosphere (External)	None	None	V.C-1 (E-35)	3.2.1-2	I, 1
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)			H, 2
					Water Chemistry (B.1.2)			H, 2
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-6 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D-27 (E-08)	3.2.1-10	C
					Water Chemistry (B.1.2)	V.D-27 (E-08)	3.2.1-10	D
Nozzle Safe Ends (Core Spray, Isolation Condenser & CRD Return)	Pressure Boundary	Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A

Table 3.1.2.1.5 Reactor Pressure Vessel (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Nozzle Safe Ends (Core Spray, Isolation Condenser & CRD Return)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking Initiation and Growth	BWR Stress Corrosion Cracking (B.1.7)	IV.A1-1 (R-68)	3.1.1-32	B
					Water Chemistry (B.1.2)	IV.A1-1 (R-68)	3.1.1-32	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-6 (R-04)	3.1.1-2	A
Nozzle Safe Ends (Feedwater & Main Steam)	Pressure Boundary	Carbon and low alloy steel	Containment Atmosphere (External)	None	None	V.C-1 (E-35)	3.2.1-2	I, 1
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)			H, 2
					Water Chemistry (B.1.2)			H, 2
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-6 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D-27 (E-08)	3.2.1-10	A

Table 3.1.2.1.5 Reactor Pressure Vessel (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Nozzle Safe Ends (Feedwater & Main Steam)	Pressure Boundary	Carbon and low alloy steel	Treated Water (Internal)	Loss of Material	Water Chemistry (B.1.2)	V.D-27 (E-08)	3.2.1-10	B
Nozzle Safe Ends (Recirculation Inlet & outlet)	Pressure Boundary	Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Treated Water (Internal)	Cracking Initiation and Growth	BWR Stress Corrosion Cracking (B.1.7)	IV.A1-1 (R-68)	3.1.1-32	B
					Water Chemistry (B.1.2)	IV.A1-1 (R-68)	3.1.1-32	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-6 (R-04)	3.1.1-2	A
Nozzle Thermal Sleeves (CRD Return Line)	Direct Flow	Stainless Steel	Treated Water	Cracking Initiation and Growth	BWR Control Rod Drive Return Line Nozzle (B.1.6)	IV.A1-1 (R-68)	3.1.1-32	E, 8
					Water Chemistry (B.1.2)	IV.A1-1 (R-68)	3.1.1-32	D
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-6 (R-04)	3.1.1-2	A
Nozzle Thermal Sleeves (Feedwater Nozzle)	Direct Flow	Nickel Alloy	Treated Water	Cracking Initiation and Growth	BWR Feedwater Nozzle (B.1.5)	IV.A1-1 (R-68)	3.1.1-32	E, 9

Table 3.1.2.1.5 Reactor Pressure Vessel (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Nozzle Thermal Sleeves (Feedwater Nozzle)	Direct Flow	Nickel Alloy	Treated Water	Cracking Initiation and Growth	Water Chemistry (B.1.2)	IV.A1-1 (R-68)	3.1.1-32	D
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-6 (R-04)	3.1.1-2	A
Nozzles (Core Spray)	Pressure Boundary	Carbon and low alloy steel (with stainless steel cladding)	Containment Atmosphere (External)	None	None	V.C-1 (E-35)	3.2.1-2	I, 1
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)			H, 2
					Water Chemistry (B.1.2)			H, 2
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-6 (R-04)	3.1.1-2	A
Nozzles (CRD Return)	Pressure Boundary	Carbon and low alloy steel (with stainless steel cladding)	Containment Atmosphere (External)	None	None	V.C-1 (E-35)	3.2.1-2	I, 1
			Treated Water (Internal)	Cracking Initiation and Growth	BWR Control Rod Drive Return Line Nozzle (B.1.6)	IV.A1-2 (R-66)	3.1.1-36	B

Table 3.1.2.1.5 Reactor Pressure Vessel (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Nozzles (CRD Return)	Pressure Boundary	Carbon and low alloy steel (with stainless steel cladding)	Treated Water (Internal)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-6 (R-04)	3.1.1-2	A
Nozzles (Feedwater)	Pressure Boundary	Carbon and low alloy steel	Containment Atmosphere (External)	None	None	V.C-1 (E-35)	3.2.1-2	I, 1
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)			H, 2
					BWR Feedwater Nozzle (B.1.5)	IV.A1-3 (R-65)	3.1.1-37	B
					Water Chemistry (B.1.2)			H, 2
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-6 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D-27 (E-08)	3.2.1-10	C
					Water Chemistry (B.1.2)	V.D-27 (E-08)	3.2.1-10	D
Nozzles (Isolation Condenser)	Pressure Boundary	Carbon and low alloy steel (with stainless steel cladding)	Containment Atmosphere (External)	None	None	V.C-1 (E-35)	3.2.1-2	I, 1

Table 3.1.2.1.5 Reactor Pressure Vessel (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Nozzles (Isolation Condenser)	Pressure Boundary	Carbon and low alloy steel (with stainless steel cladding)	Steam (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)			H, 2, 4
					Water Chemistry (B.1.2)			H, 2, 4
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-6 (R-04)	3.1.1-2	A, 4
Nozzles (Main Steam)	Pressure Boundary	Carbon and low alloy steel	Containment Atmosphere (External)	None	None	V.C-1 (E-35)	3.2.1-2	I, 1
			Steam (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)			H, 2, 4
					Water Chemistry (B.1.2)			H, 2, 4
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-6 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D-27 (E-08)	3.2.1-10	C
					Water Chemistry (B.1.2)	V.D-27 (E-08)	3.2.1-10	D

Table 3.1.2.1.5 Reactor Pressure Vessel (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Nozzles (Recirculation Inlet & Outlet)	Pressure Boundary	Carbon and low alloy steel (with stainless steel cladding)	Containment Atmosphere (External)	None	None	V.C-1 (E-35)	3.2.1-2	I, 1
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)			H, 2
					Water Chemistry (B.1.2)			H, 2
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-6 (R-04)	3.1.1-2	A
Penetrations (CRD Stub Tubes)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking Initiation and Growth	BWR Vessel Internals (B.1.9)	IV.A1-5 (R-69)	3.1.1-31	E, 7
					Water Chemistry (B.1.2)	IV.A1-5 (R-69)	3.1.1-31	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-6 (R-04)	3.1.1-2	A
	Structural Support	Stainless Steel	Treated Water (Internal)	Cracking Initiation and Growth	BWR Vessel Internals (B.1.9)	IV.A1-5 (R-69)	3.1.1-31	E, 7
					Water Chemistry (B.1.2)	IV.A1-5 (R-69)	3.1.1-31	B

Table 3.1.2.1.5 Reactor Pressure Vessel (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Penetrations (CRD Stub Tubes)	Structural Support	Stainless Steel	Treated Water (Internal)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-6 (R-04)	3.1.1-2	A
Penetrations (Instrumentation including safe ends)	Pressure Boundary	Nickel Alloy	Containment Atmosphere (External)	None	None	IV.E-2 (RP-03)	3.1.1-71	A
			Treated Water (Internal)	Cracking Initiation and Growth	BWR Penetrations (B.1.8)	IV.A1-5 (R-69)	3.1.1-31	B
					Water Chemistry (B.1.2)	IV.A1-5 (R-69)	3.1.1-31	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-6 (R-04)	3.1.1-2	A
		Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Treated Water (Internal)	Cracking Initiation and Growth	BWR Penetrations (B.1.8)	IV.A1-5 (R-69)	3.1.1-31	B
					Water Chemistry (B.1.2)	IV.A1-5 (R-69)	3.1.1-31	B

Table 3.1.2.1.5 Reactor Pressure Vessel (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Penetrations (Instrumentation including safe ends)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-6 (R-04)	3.1.1-2	A
Penetrations (Standby Liquid Control)	Pressure Boundary	Nickel Alloy	Containment Atmosphere (External)	None	None	IV.E-2 (RP-03)	3.1.1-71	A
			Treated Water (Internal)	Cracking Initiation and Growth	BWR Penetrations (B.1.8)	IV.A1-5 (R-69)	3.1.1-31	B
					Water Chemistry (B.1.2)	IV.A1-5 (R-69)	3.1.1-31	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-6 (R-04)	3.1.1-2	A
RPV Support Skirt and Attachment Welds	Structural Support	Carbon and low alloy steel	Containment Atmosphere (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-7 (R-70)	3.1.1-1	A
Top Head Closure Studs and Nuts	Mechanical Closure	High Strength Alloy Steel	Containment Atmosphere	Cracking Initiation and Growth	Reactor Head Closure Studs (B.1.3)	IV.A1-8 (R-60)	3.1.1-42	B, 10
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-6 (R-04)	3.1.1-2	A
Top Head Enclosure (Head & Nozzles)	Pressure Boundary	Carbon and low alloy steel (with stainless steel cladding)	Containment Atmosphere (External)	None	None	V.C-1 (E-35)	3.2.1-2	I, 1

Table 3.1.2.1.5 Reactor Pressure Vessel (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Top Head Enclosure (Head & Nozzles)	Pressure Boundary	Carbon and low alloy steel (with stainless steel cladding)	Steam (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)			H, 2, 3, 4
					Water Chemistry (B.1.2)			H, 2, 3, 4
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-6 (R-04)	3.1.1-2	A, 4
Top Head Enclosure Vessel Flange Leak Detection Penetration	Pressure Boundary	Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.A1-9 (R-61)	3.1.1-10	E, 6
Top Head Flange	Pressure Boundary	Carbon and low alloy steel (with stainless steel cladding)	Containment Atmosphere (External)	None	None	V.C-1 (E-35)	3.2.1-2	I, 1
			Steam (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)			H, 2, 4
					Water Chemistry (B.1.2)			H, 2, 4

Table 3.1.2.1.5 Reactor Pressure Vessel (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Top Head Flange	Pressure Boundary	Carbon and low alloy steel (with stainless steel cladding)	Steam (Internal)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-6 (R-04)	3.1.1-2	A, 4
Vessel Bottom Head	Pressure Boundary	Carbon and low alloy steel (with stainless steel cladding)	Containment Atmosphere (External)	None	None	V.C-1 (E-35)	3.2.1-2	I, 1
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)			H, 2
					Water Chemistry (B.1.2)			H, 2
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-6 (R-04)	3.1.1-2	A
Vessel Shell (Upper, upper intermediate, lower intermediate, lower, and belt line welds)	Pressure Boundary	Carbon and low alloy steel (with stainless steel cladding)	Containment Atmosphere (External)	None	None	V.C-1 (E-35)	3.2.1-2	I, 1
			Treated Water >482F (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)			H, 2

Table 3.1.2.1.5 Reactor Pressure Vessel (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Vessel Shell (Upper, upper intermediate, lower intermediate, lower, and belt line welds)	Pressure Boundary	Carbon and low alloy steel (with stainless steel cladding)	Treated Water >482F (Internal)	Cracking Initiation and Growth	Water Chemistry (B.1.2)			H, 2
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-6 (R-04)	3.1.1-2	A
				Loss of Fracture Toughness	Reactor Vessel Surveillance (B.1.23)	IV.A1-13 (R-63)	3.1.1-7	A
					TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-12 (R-62)	3.1.1-6	A, 5
Vessel Shell Attachment Welds	Structural Support	Nickel Alloy	Treated Water (Internal)	Cracking Initiation and Growth	BWR Vessel ID Attachment Welds (B.1.4)	IV.A1-11 (R-64)	3.1.1-33	B
					Water Chemistry (B.1.2)	IV.A1-11 (R-64)	3.1.1-33	B

Table 3.1.2.1.5 Reactor Pressure Vessel (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Vessel Shell Flange	Pressure Boundary	Carbon and low alloy steel (with stainless steel cladding)	Containment Atmosphere (External)	None	None	V.C-1 (E-35)	3.2.1-2	I, 1
			Steam (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)			H, 2, 4
					Water Chemistry (B.1.2)			H, 2, 4
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.A1-6 (R-04)	3.1.1-2	A, 4

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. Based on past precedence (NUREG-1796, Dresden and Quad Cities SER, paragraph 3.1.2.4.1), the Staff concluded that the loss of material due to corrosion is not considered a credible aging effect for carbon steel components in a containment nitrogen environment because of negligible amounts of free oxygen (less than 4 percent by volume during normal operation). Both oxygen and moisture must be present for general corrosion to occur because oxygen alone or water free of dissolved oxygen (high humidity in a nitrogen atmosphere) does not corrode carbon steel to any practical extent. The staff found the applicant's identification of no loss of material for the carbon steel components exposed to a containment nitrogen environment acceptable because, with the negligible amounts of free oxygen, anodic reactions do not take place and the corrosion cell does not form. Therefore, no loss of material due to corrosion takes place and the aging effect is none.
2. This component is made of SA 105 Grade II carbon steel. Management of cracking for this reactor vessel component made of this material is not described in NUREG 1801. The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program includes inspection of these components for cracking initiation and growth; therefore the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD and Water Chemistry programs are credited here for managing the effects of Cracking Initiation and Growth for this component.
3. NUREG 1801 line reference IV.A1-10 (R-59) identifies loss of material as an applicable aging effect for top head enclosures fabircated with steel. The Oyster Creek top head enclosure is fabricated with steel but contains a stainless steel clad which is not susceptible to loss of material. As such, loss of material was not selected as an applicable aging effect for this component.

4. The environment of steam is considered similar to the environment of reactor coolant or treated water for evaluation of this component and material, consistent with the environment definitions in NUREG-1801 Chapter IX.
5. Loss of fracture toughness due to neutron embrittlement was evaluated Appendix G of 10CFR50 and RG 1.99, following the guidance of BWRVIP-74A.
6. The environment of Treated Water includes the environment of air with reactor coolant leakage descibed in NUREG-1801.
7. The BWR Penetrations program does not address CRD stub tubes. The CRD stub tubes are addressed in the BWR Vessel Internals program.
8. The integrity of the CRD return line thermal sleeve is inspected as part of the BWR CRD Return Line Nozzle aging management program.
9. The integrity of the feedwater nozzle thermal sleeve is inspected as part of the BWR Feedwater Nozzle aging management program.
10. The operating experience for these components indicates that nicks, scratches, gouges, and thread damage have occurred due to maintenance activities during refueling outages. These were determined to be acceptable for continued service. There have been no deficiencies attributed to distortion/plastic deformation from stress relaxation or loss of material due to mechanical wear.

Table 3.1.2.1.6
Reactor Recirculation System
Summary of Aging Management Evaluation

Table 3.1.2.1.6 Reactor Recirculation System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Containment Atmosphere (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 5
			Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 5
		Carbon and low alloy steel	Containment Atmosphere (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 5

Table 3.1.2.1.6 Reactor Recirculation System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
						VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 5
						VII.I-5 (AP-26)	3.3.1-35	B
Coolers (oil)	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External) - shell	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Lubricating Oil (Internal) shell side components	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.H2-3 (AP-39)	3.3.1-21	E
					One-Time Inspection (B.1.24)	VII.H2-3 (AP-39)	3.3.1-21	E
Filter Housing (oil)	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.E4-17 (AP-30)	3.3.1-16	E
					One-Time Inspection (B.1.24)	VII.E4-17 (AP-30)	3.3.1-16	E

Table 3.1.2.1.6 Reactor Recirculation System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flow Element	Pressure Boundary	Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Treated Water (Internal)	Cracking Initiation and Growth	BWR Stress Corrosion Cracking (B.1.7)	IV.C1-9 (R-22)	3.1.1-32	B
					Water Chemistry (B.1.2)	IV.C1-9 (R-22)	3.1.1-32	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
Fluid Drive (M-G Set Coupling) - Reservoir	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.E4-17 (AP-30)	3.3.1-16	E
					One-Time Inspection (B.1.24)	VII.E4-17 (AP-30)	3.3.1-16	E
Oil Mist Eliminator - Reservoir	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E

Table 3.1.2.1.6 Reactor Recirculation System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Oil Mist Eliminator - Reservoir	Leakage Boundary	Carbon and low alloy steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.E4-17 (AP-30)	3.3.1-16	E
					One-Time Inspection (B.1.24)	VII.E4-17 (AP-30)	3.3.1-16	E
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Containment Atmosphere (External)	None	None	VII.I-7 (A-77)	3.3.1-12	I, 3
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.E4-17 (AP-30)	3.3.1-16	E
					One-Time Inspection (B.1.24)	VII.E4-17 (AP-30)	3.3.1-16	E
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
		Stainless Steel	Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E

Table 3.1.2.1.6 Reactor Recirculation System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water <140F (Internal)	Loss of Material	Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
	Pressure Boundary	Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Indoor Air (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-1 (R-03)	3.1.1-9	B
						IV.C1-2 (R-55)	3.1.1-21	B
						IV.C1-9 (R-22)	3.1.1-32	E, 2
					BWR Stress Corrosion Cracking (B.1.7)	IV.C1-9 (R-22)	3.1.1-32	B
					One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	A
						IV.C1-2 (R-55)	3.1.1-21	A

Table 3.1.2.1.6 Reactor Recirculation System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking Initiation and Growth	Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	B
						IV.C1-9 (R-22)	3.1.1-32	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
Pump Casing	Pressure Boundary	CASS	Containment Atmosphere (External)	None	None	IV.E-1 (RP-02)	3.1.1-71	A
			Treated Water >482F (Internal)	Cracking Initiation and Growth	BWR Stress Corrosion Cracking (B.1.7)	IV.C1-10 (R-20)	3.1.1-32	B
					Water Chemistry (B.1.2)	IV.C1-10 (R-20)	3.1.1-32	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Fracture Toughness	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-4 (R-08)	3.1.1-47	B

Table 3.1.2.1.6 Reactor Recirculation System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pump Casing	Pressure Boundary	CASS	Treated Water >482F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E, 1
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E, 1
Sight Glasses (oil)	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.E4-17 (AP-30)	3.3.1-16	E
					One-Time Inspection (B.1.24)	VII.E4-17 (AP-30)	3.3.1-16	E
		Glass	Indoor Air (External)	None	None	VII.J-10 (AP-14)	3.3.1-75	A
			Lubricating Oil (Internal)	None	None	VII.J-12 (AP-15)	3.3.1-75	A
Thermowell	Pressure Boundary	Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Treated Water (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	E, 4, 6
						IV.C1-2 (R-55)	3.1.1-21	E, 4, 6

Table 3.1.2.1.6 Reactor Recirculation System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Thermowell	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking Initiation and Growth	Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	E, 4, 6
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
Valve Body	Leakage Boundary	Carbon and low alloy steel	Containment Atmosphere (External)	None	None	VII.I-7 (A-77)	3.3.1-12	I, 3
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.E4-17 (AP-30)	3.3.1-16	E
					One-Time Inspection (B.1.24)	VII.E4-17 (AP-30)	3.3.1-16	E
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B

Table 3.1.2.1.6 Reactor Recirculation System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
	Pressure Boundary	CASS	Containment Atmosphere (External)	None	None	IV.E-1 (RP-02)	3.1.1-71	A
			Treated Water >482F (Internal)	Cracking Initiation and Growth	BWR Stress Corrosion Cracking (B.1.7)	IV.C1-10 (R-20)	3.1.1-32	B
					Water Chemistry (B.1.2)	IV.C1-10 (R-20)	3.1.1-32	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Fracture Toughness	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-4 (R-08)	3.1.1-47	B
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E, 1
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E, 1

Table 3.1.2.1.6 Reactor Recirculation System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Indoor Air (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Treated Water (Internal)	Cracking Initiation and Growth	BWR Stress Corrosion Cracking (B.1.7)	IV.C1-9 (R-22)	3.1.1-32	B
					One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	E, 4, 6
						IV.C1-2 (R-55)	3.1.1-21	E, 4, 6
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	E, 4, 6
						IV.C1-9 (R-22)	3.1.1-32	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. CASS material for this item is assumed to be a subset of Stainless Steel for this aging effect.
2. The program for ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD is applied in addition to the NUREG-1801 specified programs for this item.
3. Based on past precedence (NUREG-1796, Dresden and Quad Cities SER, paragraph 3.1.2.4.1), the Staff concluded that the loss of material due to corrosion is not considered a credible aging effect for carbon steel components in a containment nitrogen environment because of negligible amounts of free oxygen (less than 4 percent by volume during normal operation). Both oxygen and moisture must be present for general corrosion to occur because oxygen alone or water free of dissolved oxygen (high humidity in a nitrogen atmosphere) does not corrode carbon steel to any practical extent. The staff found the applicant's identification of no loss of material for the carbon steel components exposed to a containment nitrogen environment acceptable because, with the negligible amounts of free oxygen, anodic reactions do not take place and the corrosion cell does not form. Therefore, no loss of material due to corrosion takes place and the aging effect is none.
4. ASME XI Inservice Inspection, Subsections IWB, IWC, and IWD does not apply to cracking of these items.
5. Line item IV.C1-12 (R-27) for loss of preload for RCPB closure bolting does not apply since the A 193 B7 alloy steel closure bolting is not high-strength. Line item V.E-5 (EP-24) has been applied to the loss of preload aging effect for RCPB closure bolting.
6. The applicable programs for the aging effect of cracking as identified in IV.C1-1 (R-03) and IV.C1-2 (R-55) for Class 1 piping, fittings, and branch

connections < NPS 4 have been applied to components < NPS 4.

3.2 AGING MANAGEMENT OF ENGINEERED SAFETY FEATURES

3.2.1 INTRODUCTION

This section provides the results of the aging management review for those components identified in Section 2.3.2, Engineered Safety Features, as being subject to aging management review. The systems, or portions of systems, which are addressed in this section are described in the indicated sections.
- Containment Spray System (2.3.2.2)
- Core Spray System (2.3.2.3)
- Standby Gas Treatment System (2.3.2.4)

3.2.2 RESULTS

3.2.2.1 Materials, Environments, Aging Effects Requiring Management and Aging Management Programs For The Engineered Safety Features

3.2.2.1.1 Containment Spray System

Materials

The materials of construction for the Containment Spray System components are:
- Alloy Steel
- Carbon and Low Alloy Steel
- Cast Iron
- Stainless Steel

Environments

The Containment Spray System components are exposed to the following environments:
- Containment Atmosphere
- Indoor Air
- Soil
- Treated Water <140F

Aging Effects Requiring Management

The following aging effects associated with the Containment Spray System components require management:
- Cumulative Fatigue Damage (TLAA)
- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Containment Spray System components:

- Bolting Integrity
- Buried Piping Inspection
- One-Time Inspection
- Periodic Testing of Containment Spray Nozzles
- Selective Leaching of Materials
- Structures Monitoring Program
- Water Chemistry

Table 3.2.2.1.1, Summary of Aging Management Evaluation – Containment Spray System summarizes the results of the aging management review for the Containment Spray System.

3.2.2.1.2 Core Spray System

Materials

The materials of construction for the Core Spray System components are:

- Alloy Steel
- Carbon and Low Alloy Steel
- Cast Austinetic Stainless Steel (CASS)
- Glass
- Stainless Steel

Environments

The Core Spray System components are exposed to the following environments:

- Containment Atmosphere
- Indoor Air
- Treated Water
- Treated Water <140F

Aging Effects Requiring Management

The following aging effects associated with the Core Spray System components require management:

- Cracking Initiation and Growth
- Cumulative Fatigue Damage (TLAA)
- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Core Spray System components:

- ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD

- Bolting Integrity
- BWR Stress Corrosion Cracking
- One-Time Inspection
- Structures Monitoring Program
- Water Chemistry

Table 3.2.2.1.2, Summary of Aging Management Evaluation – Core Spray System summarizes the results of the aging management review for the Automatic Depressurization System.

3.2.2.1.3 Standby Gas Treatment System

Materials

The materials of construction for the Standby Gas Treatment System components are:
- Aluminum
- Brass
- Carbon and Low Alloy Steel
- Cast Iron
- Copper
- Elastomer
- Galvanized Steel
- Plexiglass
- Stainless Steel

Environments

The Standby Gas Treatment System components are exposed to the following environments:
- Indoor Air
- Outdoor Air
- Soil

Aging Effects Requiring Management

The following aging effects associated with the Standby Gas Treatment System components require management:
- Change in Material Properties
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Standby Gas Treatment System components:
- Periodic Inspection of Ventilation Systems (B.2.4)
- Structures Monitoring Program (B.1.31)

Table 3.2.2.1.3, Summary of Aging Management Evaluation – Standby Gas Treatment System summarizes the results of the aging management review for the Standby Gas Treatment System.

3.2.2.2 AMR Results Consistent with the GALL Report for Which Further Evaluation is Recommended

NUREG 1801 provides the basis for identifying those programs that warrant further evaluation by the reviewer in the LRA. For the Engineered Safety Features, those programs are addressed in the following subsections.

3.2.2.2.1 Cumulative Fatigue Damage (BWR/PWR)

Fatigue is a TLAA as defined in 10 CFR 54.3. TLAAs are required to be evaluated in accordance with 10 CFR 54.21(c). The evaluation of Fatigue as a TLAA for the non-Class 1 portions of the Core Spray System, Containment Spray System, and Isolation Condenser System is discussed in Section 4.3.3.

3.2.2.2.2 Loss of Material due to General Corrosion (BWR/PWR)

Loss of material due to general corrosion could occur for the internal and external surfaces of BWR and PWR steel components exposed to air and moisture. The GALL report recommends further evaluation on a plant specific basis to ensure that the aging effect is adequately managed.

Oyster Creek will use the 10CFR50 Appendix J program, B.1.29, in association with the ASME Section XI, Subsection IWE program, B.1.27, to inspect piping and fittings in the Containment Vacuum Breaker System. The primary containment leakage rate testing program provides for aging management of pressure boundary degradation due to loss of material in systems penetrating primary containment. The primary containment inservice inspection (ISI) program utilizes inspections for degradation of accessible surface areas. Together, these programs detect degradation of the vacuum breaker system prior to the loss of intended function. Observed conditions that have the potential for impacting the intended function are evaluated or corrected in accordance with the corrective action process. The 10CFR50 Appendix J program and ASME Section XI, Subsection IWE program are described in Appendix B.

The Periodic Inspection of Ventilation Systems program, B.2.4, will be used to perform visual inspections of piping, piping components, piping elements, and fan and damper housings for the Standby Gas Treatment System. Program activities include periodic visual inspections and systems tests to ensure aging degradation is detected prior to loss of intended function. Observed conditions that have the potential for impacting the intended function are evaluated or corrected in accordance with the corrective action process. The Periodic Inspection of Ventilation Systems program is described in Appendix B.

The One-Time Inspection program, B.1.24, will be used to inspect the isolation condenser shell and shell side components and the internal surfaces of carbon steel vent piping in an indoor air environment in the Isolation Condenser System. When not in service, portions of the isolation condenser shell and the ventilation piping contain indoor air, and inspection of the internal surfaces verifies that unacceptable degradation is not occurring and that the component intended function will be maintained during the extended period of operation. Observed conditions that have the potential for impacting the intended function are evaluated or corrected in accordance with the corrective action process. The One-Time Inspection program is described in Appendix B.

The Structures Monitoring program, B.1.31, will be used to inspect the external surfaces of steel piping, piping components, piping elements, and ducting in an indoor air or outdoor air environment for the Containment Spray System, Core Spray System, Standby Gas Treatment System, Containment Vacuum Breakers System, Isolation Condenser System, Post-Accident Sampling System, and Drywell Floor and Equipment Drains System when there are no other aging management programs that inspect the items. The Structures Monitoring program directs periodic visual inspections to identify and evaluate the degradation of the inspected items to ensure that there is no loss of intended function. Observed conditions that have the potential for impacting the intended function are evaluated or corrected in accordance with the corrective action process. The Maintenance Rule Structures Monitoring Program is described in Appendix B.

The external surfaces of the Reactor Pressure Vessel nozzles in an environment of containment atmosphere do not require an aging management program. The aging effect of loss of material due to general corrosion in the Primary Containment atmosphere does not need to be considered for carbon steel components in a containment nitrogen environment because of negligible amounts of free oxygen (less than 4 percent by volume during normal operation). Both oxygen and moisture must be present for general corrosion to occur because oxygen alone or water free of dissolved oxygen (high humidity in a nitrogen atmosphere) does not corrode carbon steel to any practical extent. Therefore, there is no loss of material for carbon steel components exposed to a containment nitrogen environment because, with the negligible amounts of free oxygen, anodic reactions do not take place and the corrosion cell does not form. This conclusion is supported by past precedence (NUREG-1796, Dresden and Quad Cities SER, paragraph 3.1.2.4.1).

3.2.2.2.3 Loss of Material due to Pitting and Crevice Corrosion (BWR/PWR)

1. Loss of material due to pitting and crevice corrosion could occur for stainless steel piping, piping components, and piping elements exposed to treated water. The GALL report recommends further evaluation to ensure that the aging effect is adequately managed.

   Oyster Creek will use the Water Chemistry program, B.1.2, to manage aging of stainless steel piping and components exposed to treated water in the Containment Spray System, Containment Vacuum Breakers System, Condensate Transfer System, Core Spray System, Isolation Condenser System, Nuclear Boiler Instrumentation System, Post-Accident Sampling System, and Reactor Recirculation System. The program activities provide for monitoring and controlling of water chemistry using station procedures and processes for the prevention or mitigation of loss of material aging effects. The One-Time Inspection program, B.1.24, will be used in each of these systems for verification of chemistry control and confirmation of the absence of loss of material. Observed conditions that have the potential for impacting the intended function are evaluated or corrected in accordance with the corrective action process. The Water Chemistry program and the One-Time Inspection program are described in Appendix B.

The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program, B.1.1, will be used to inspect the isolation condenser stainless steel tubes and tube side components to ensure that significant degradation is not occurring and the component intended function will be maintained during the extended period of operation. Observed conditions that have the potential for impacting the intended function are evaluated or corrected in accordance with the corrective action process. The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program is described in Appendix B.

2. Loss of material from pitting and crevice corrosion could occur for stainless steel components in contact with soil, untreated, or raw water (including internal condensation). The GALL report recommends that a plant-specific aging management program should be evaluated and that the program specifically address the bottom of partially encased tanks because moisture and water can egress under the tank due to cracking of the perimeter seal from weathering. The GALL report recommends further evaluation to ensure that the aging effect is adequately managed.

   This Item Number is not used at Oyster Creek. The Engineered Safety Features Systems have no stainless steel piping, piping components or piping elements in contact with soil, untreated, or raw water (including internal condensation). Oyster Creek has no external or partially encased stainless steel tanks in the scope of license renewal.

3.2.2.2.4 <u>Loss of Material due to General, Pitting, Crevice, and Microbiologically Influenced Corrosion (BWR/PWR)</u>

Loss of material due to general, pitting, crevice, and microbiologically influenced corrosion (MIC) could occur for steel BWR and PWR containment isolation piping, piping components, and piping elements exposed internally to untreated water in systems that are not addressed in other chapters of the GALL report. The GALL report recommends further evaluation to ensure that the aging effect is adequately managed.

Oyster Creek will use the One-Time Inspection program, B.1.24, to evaluate for loss of material the steel portion of Drywell Floor and Equipment Drains

System piping that provides the containment isolation barrier. The program elements include determination of appropriate inspection sample size, identification of inspection locations, selection of examination techniques with acceptance criteria, and evaluation of results. Observed conditions that have the potential for impacting the intended function are evaluated or corrected in accordance with the corrective action process. The One-Time Inspection program is described in Appendix B.

3.2.2.2.5 Hardening and Loss of Strength due to Elastomer Degradation (BWR)

Hardening and loss of strength due to elastomer degradation could occur in seals associated with BWR standby gas treatment systems. The GALL report recommends further evaluation to ensure that the aging effect is adequately managed.

Oyster Creek will use the Periodic Inspection of Ventilation Systems program, B.2.4, to evaluate elastomer door seals and flexible connections in the Standby Gas Treatment System. Periodic inspections are performed on elastomer door seals and flexible connections to identify detrimental changes in material properties, as evidenced by cracking, perforations in the material, or leakage. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Periodic Inspection of Ventilation Systems program is described in Appendix B.

3.2.2.2.6 Loss of Material due to Erosion (PWR)

This is applicable to PWRs only.

3.2.2.2.7 General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling (BWR/PWR)

1. Loss of material due to pitting, crevice and microbiologically influenced corrosion, and fouling could occur for the internal surfaces of stainless steel containment isolation piping, piping components, and piping elements in contact with raw or untreated water. The GALL report recommends further evaluation to ensure that the aging effect is adequately managed.

   Oyster Creek will use the One-Time Inspection program, B.1.24, to evaluate for loss of material the stainless steel portion of Drywell Floor and Equipment Drains System piping that provides the containment isolation barrier. The program elements include determination of appropriate inspection sample size, identification of inspection locations, selection of examination techniques with acceptance criteria, and evaluation of results. Observed conditions that have the potential for impacting the intended function are evaluated or corrected in accordance with the corrective action process. The One-Time Inspection program is described in Appendix B.

2. Loss of material due to general, pitting, crevice and microbiologically influenced corrosion and fouling could occur for steel containment isolation piping, piping components, and piping elements in contact with raw water. The GALL report recommends further evaluation to ensure that the aging effect is adequately managed.

   This Item Number is not used at Oyster Creek. Item Number 3.2.1-5 discussed in 3.2.2.2.4 above addresses loss of material for steel components in an untreated water environment due to pitting, crevice and microbiologically influenced corrosion, and fouling, and was used for Oyster Creek components in lieu of Item Number 3.2.1-9.

3.2.2.2.8 Loss of Material due to General, Pitting and Crevice Corrosion (BWR/PWR)

1. Loss of material due to general, pitting and crevice corrosion could occur for BWR aluminum and steel piping, piping components, and piping elements in contact with treated water. The existing aging management program relies on monitoring and control of water chemistry based on EPRI guidelines of BWRVIP 29 (EPRI TR-103515) for BWRs to mitigate degradation. However, control of water chemistry does not preclude loss of material due to general, pitting, and crevice corrosion at locations of stagnant flow conditions. Therefore, the effectiveness of the chemistry control program should be verified to ensure that corrosion is not occurring. The GALL report recommends further evaluation of programs to verify the effectiveness of the chemistry control program. A one-time inspection of select components at susceptible locations is an acceptable method to determine whether an aging effect is not occurring or an aging effect is progressing very slowly such that the component's intended function will be maintained during the period of extended operation.

   Oyster Creek will use the Water Chemistry program, B.1.2, to manage aging of steel piping, piping components, and piping elements exposed to a treated water environment in the Containment Spray System, Core Spray System, Isolation Condenser System, Post-Accident Sampling System, and Reactor Pressure Vessel. The program activities provide for monitoring and controlling of water chemistry using station procedures and processes for the prevention or mitigation of loss of material aging effects. The One-Time Inspection program, B.1.24, will be used in each of these systems for verification of chemistry control and confirmation of the absence of loss of material. The Periodic Inspection of Containment Spray Nozzles program, B.2.1, will also be used to manage corrosion of steel piping and piping components in the Containment Spray System. Observed conditions that have the potential for impacting the intended function are evaluated or corrected in accordance with the corrective action process. The Water Chemistry program, the One-Time Inspection program, and the Periodic Inspection of Containment Spray Nozzles program are described in Appendix B.

2. Loss of material due to general, pitting and crevice corrosion could occur for steel ducting closure bolting in uncontrolled air and for the internal surfaces of steel piping, piping components, and piping elements in

contact with treated water or subject to wetting by condensation. The GALL report recommends further evaluation to ensure that the aging effect is adequately managed.

Oyster Creek will implement a Structures Monitoring Program, B.1.31, to inspect the steel closure bolting in an uncontrolled indoor air external environment for the Standby Gas Treatment System. The Structures Monitoring Program relies on periodic visual inspections by qualified individuals to identify and evaluate the degradation of external surfaces of the bolting to ensure that there is no loss of intended function. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Structures Monitoring Program is described in Appendix B.

The Oyster Creek Engineered Safety Features Systems have no steel piping, piping components, or piping elements (internal surfaces) exposed to condensation, treated water, or air-indoor uncontrolled environments.

3. Loss of material due to general, pitting and crevice corrosion could occur for steel piping, piping components, and piping elements buried in soil. The buried piping and tanks inspection program relies on industry practice, frequency of pipe excavation, and operating experience to manage the effects of loss of material from general, pitting, and crevice corrosion and MIC. The staff reviews the applicant’s program, including inspection frequency and operating experience with buried components, to assess the effectiveness of the buried piping and tanks inspection program in ensuring that corrosion is not occurring and that the component's intended function will be maintained during the period of extended operation.

   Oyster Creek will implement a Buried Piping Inspection program, B.1.26, to manage the loss of material in steel piping, piping components, and piping elements exposed to soil in the Containment Spray System. The Buried Piping Inspection program includes preventive measures to mitigate corrosion and periodic inspection to manage the effects of corrosion on the pressure-retaining capacity of buried steel piping, piping components, and piping elements. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Buried Piping Inspection program is described in Appendix B.

   Oyster Creek Engineered Safety Features Systems have no buried steel tanks in the scope of license renewal.

3.2.2.2.9 Loss of Material due to General Corrosion and Fouling (BWR)

Loss of material due to general corrosion and fouling can occur for steel drywell and suppression chamber spray system nozzle and flow orifice internal surfaces exposed to air - indoor uncontrolled. This could result in plugging of the spray nozzles and flow orifices. This aging mechanism and effect will apply since the spray nozzles and flow orifices are occasionally wetted, even though the majority of the time this system is on standby. The wetting and drying of these components can accelerate corrosion and fouling. The GALL report recommends further evaluation to ensure that the aging effect is adequately managed.

This Item Number is not used at Oyster Creek. The containment spray nozzle and orifice assemblies used at Oyster Creek are stainless steel.

3.2.2.3 Time-Limited Aging Analysis

The time-limited aging analyses identified below are associated with the Engineered Safety Features system components:

- Section 4.3, Metal Fatigue Analysis

3.2.3 CONCLUSION

The Engineered Safety Features systems piping, fittings, and components that are subject to aging management review have been identified in accordance with the requirements of 10 CFR 54.4. The aging management programs selected to manage aging effects for the Engineered Safety Features system components are identified in the summaries in Section 3.2.2.1 above.

A description of these aging management programs is provided in Appendix B, along with the demonstration that the identified aging effects will be managed for the period of extended operation.

Therefore, based on the conclusions provided in Appendix B, the effects of aging associated with the Engineered Safety Features system components will be adequately managed so that there is reasonable assurance that the intended function(s) will be maintained consistent with the current licensing basis during the period of extended operation.

Table 3.2.1 Summary of Aging Management Evaluations for the Engineered Safety Features

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.2.1-1	Piping, piping components, and piping elements in emergency core cooling system	Cumulative fatigue damage	TLAA, evaluated in accordance with 10 CFR 54.21(c)	Yes, TLAA	Fatigue is a TLAA; further evaluation is documented in Subsection 3.2.2.2.1.
3.2.1-2	Steel components (including piping and ducting) exposed to external condensation or outside air, internally or externally to indoor uncontrolled air	Loss of material due to general corrosion	Plant specific	Yes, plant specific	The 10CFR50 Appendix J program, B.1.29, in association with the ASME Section XI, Subsection IWE program, B.1.27, is used to inspect piping and fittings in the Containment Vacuum Breaker System. The Periodic Inspection of Ventilation Systems program, B.2.4, will be used to manage aging effects by visually inspecting piping, piping components, piping elements, and fan and damper housings in the Standby Gas Treatment System. The One-Time Inspection program, B.1.24, will be used to manage aging effects by inspecting the isolation condenser shell and shell side components, and internal surfaces of carbon steel vent piping in an indoor air environment in the Isolation Condenser System. The Structures Monitoring program, B.1.31, will be used to manage aging effects by inspecting the external surfaces of steel piping, piping components, piping elements, and ducting in an indoor air or outdoor air

Table 3.2.1 Summary of Aging Management Evaluations for the Engineered Safety Features

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
					environment for various ESF Systems. The external surfaces of the Reactor Pressure Vessel nozzles in an environment of containment atmosphere do not require an aging management program due to negligible amounts of free oxygen. See subsection 3.2.2.2.2.
3.2.1-3	Stainless steel piping, piping components, and piping elements exposed to treated water	Loss of material due to pitting and crevice corrosion	Plant specific	Yes, plant specific	The Water Chemistry program, B.1.2, will be used to manage aging of stainless steel piping and components exposed to treated water. The One-Time Inspection program, B.1.24, is used for verification of chemistry control and confirmation of the absence of loss of material. The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program, B.1.1, will be used to inspect the isolation condenser stainless steel tubes and tube side components to ensure that significant degradation is not occurring and the component intended function will be maintained during the extended period of operation. See subsection 3.2.2.2.3.1.

Table 3.2.1 Summary of Aging Management Evaluations for the Engineered Safety Features

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.2.1-4	Stainless steel piping, piping components, and piping elements exposed to soil, untreated or raw water, or internal condensation; partially encased stainless steel tanks with breached moisture barrier exposed to raw or untreated water	Loss of material due to pitting and crevice corrosion	A plant-specific aging management program is to be evaluated. Pitting and crevice corrosion of tank bottoms are of concern because moisture and water can egress under the tank due to cracking of the perimeter seal from weathering.	Yes, plant specific	Not Applicable. The Oyster Creek Engineered Safety Features Systems have no stainless steel piping, piping components or piping elements in contact with soil, untreated, or raw water (including internal condensation). Oyster Creek has no external or partially encased stainless steel tanks in the scope of license renewal. See subsection 3.2.2.2.3.2.
3.2.1-5	Steel containment isolation piping and components internal surfaces exposed to untreated water	Loss of material due to general, pitting, crevice, and microbiologically influenced corrosion	Plant specific	Yes, plant specific	The One-Time Inspection program, B.1.24, will be used to evaluate the steel portion of Drywell Floor and Equipment Drains System piping that provides the containment isolation barrier. See subsection 3.2.2.2.4.
3.2.1-6	Elastomer seals in standby gas treatment system exposed to air - indoor uncontrolled	Hardening and loss of strength due to elastomer degradation	Plant specific	Yes, plant specific	The Periodic Inspection of Ventilation Systems program, B.2.4, will be used to evaluate elastomer door seals and flexible connections in the Standby Gas Treatment system. See subsection 3.2.2.2.5.

Table 3.2.1 Summary of Aging Management Evaluations for the Engineered Safety Features

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.2.1-7	PWR Only				
3.2.1-8	Stainless steel containment isolation piping and components internal surfaces exposed to raw or untreated water	Loss of material due to pitting, crevice, and microbiologically influenced corrosion, and fouling	A plant-specific aging management program is to be evaluated. See IN 85-30 for evidence of microbiologically influenced corrosion.	Yes, plant specific	The One-Time Inspection program, B.1.24, will be used to evaluate for loss of material the stainless steel portion of Drywell Floor and Equipment Drains System piping that provides the containment isolation barrier. See subsection 3.2.2.2.7.1.
3.2.1-9	Steel containment isolation piping and components internal surfaces exposed to raw water	Loss of material due to general, pitting, crevice, and microbiologically influenced corrosion, and fouling	A plant-specific aging management program is to be evaluated. See IN 85-30 for evidence of microbiologically influenced corrosion.	Yes, plant specific	Not Applicable. Item Number 3.2.1-5 addresses loss of material for steel components in an untreated water environment due to pitting, crevice and microbiologically influenced corrosion, and fouling, and was used for Oyster Creek components. See subsection 3.2.2.2.7.2.

Table 3.2.1 Summary of Aging Management Evaluations for the Engineered Safety Features

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.2.1-10	Steel and aluminum 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.	Oyster Creek will use the Water Chemistry program, B.1.2, to manage aging of steel piping, piping components, and piping elements exposed to a treated water environment in the Containment Spray System, Core Spray System, Isolation Condenser System, Post-Accident Sampling System, and Reactor Pressure Vessel. The One-Time Inspection program, B.1.24, will be used in each of these systems for verification of chemistry control and confirmation of the absence of loss of material. The Periodic Testing of Containment Spray Nozzles program (B.2.1) will also be used to manage loss of material due to corrosion in the Containment Spray System. See subsection 3.2.2.2.8.1.

Table 3.2.1 Summary of Aging Management Evaluations for the Engineered Safety Features

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.2.1-11	Steel piping, piping components, and piping elements (internal surfaces) and ducting closure bolting exposed to condensation (internal), treated water, or air – indoor uncontrolled (external)	Loss of material due to general, pitting and crevice corrosion	Plant specific	Yes, plant specific	Oyster Creek will implement a Structures Monitoring Program, B.1.31, to inspect the steel closure bolting in an uncontrolled indoor air external environment of ductwork in the Standby Gas Treatment System. The Structures Monitoring Program manages aging effects with periodic visual inspections to identify and evaluate the degradation of external surfaces of the bolting to ensure that there is no loss of intended function. The Oyster Creek Engineered Safety Features Systems have no steel piping, piping components, or piping elements (internal surfaces) exposed to condensation, treated water, or air-indoor uncontrolled environments. See subsection 3.2.2.2.8.2.
3.2.1-12	Steel piping, piping components, and piping elements buried in soil	Loss of material due to general, pitting and crevice corrosion	Buried Piping and Tanks Surveillance or Buried Piping and Tanks Inspection	No Yes, detection of aging effects and operating experience are to be further evaluated	The Buried Piping Inspection Program, B.1.26, will be used to manage the loss of material in steel piping, piping components, and piping elements exposed to soil. The Oyster Creek Engineered Safety Features Systems have no buried steel tanks in the scope of license renewal. See subsection 3.2.2.2.8.3.

Table 3.2.1 Summary of Aging Management Evaluations for the Engineered Safety Features

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.2.1-13	Steel drywell and suppression chamber spray system nozzle and flow orifice internal surfaces exposed to air - indoor uncontrolled	Loss of material due to general corrosion and fouling	Plant specific	Yes, plant specific	Not Applicable. The containment spray nozzle and orifice assemblies used at Oyster Creek are stainless steel. See Item Number 3.2.1-35. See subsection 3.2.2.2.9.
3.2.1-14	Cast austenitic stainless steel piping, piping components, and piping elements exposed to treated water (borated or unborated) >250°c (>482°f)	Loss of fracture toughness due to thermal aging embrittlement	Thermal aging embrittlement of CASS	No	Not Applicable. Oyster Creek has no CASS components susceptible to thermal aging embrittlement located in the portions of the ESF Systems governed by Group B Quality Standards. CASS components located in the portions of the ESF Systems governed by Group A Quality Standards are discussed in Item Number 3.1.1-43 and Item Number 3.1.1-47.
3.2.1-15	Stainless steel piping, piping components, and piping elements exposed to treated water >60°c (>140°f)	Cracking due to Stress corrosion cracking and intergranular stress corrosion cracking	BWR Stress Corrosion Cracking and Water Chemistry	No	Not Applicable. Oyster Creek has no stainless steel piping, piping components, or piping elements susceptible to stress corrosion cracking or intergranular stress corrosion cracking located in the portions of the ESF Systems governed by Group B Quality Standards. These items located in the portions of the ESF Systems governed by Group A Quality Standards are discussed in Item Number 3.1.1-9.

Table 3.2.1 Summary of Aging Management Evaluations for the Engineered Safety Features

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.2.1-16	Steel piping, piping components, and piping elements exposed to air and steam or treated water	Wall thinning due to flow-accelerated corrosion	Flow-accelerated corrosion	No	Not Applicable. Oyster Creek has no steel piping, piping components, or piping elements susceptible to flow-accelerated corrosion in the portions of the ESF Systems governed by Group B Quality Standards, as these portions of the ESF Systems are low-temperature systems.
3.2.1-17	Copper alloy piping, piping components, piping elements, and heat exchanger tubes exposed to closed cycle cooling water	Loss of material due to pitting, crevice, and galvanic corrosion	Closed-Cycle Cooling Water System	No	Not Applicable. Oyster Creek has no copper alloy piping, piping components, or piping elements exposed to closed cycle cooling water in the ESF Systems.
3.2.1-18	Copper alloy >15% Zn piping, piping components, piping elements, and heat exchanger tubes exposed to closed cycle cooling water	Loss of material due to selective leaching	Selective Leaching of Materials	No	Not Applicable. Oyster Creek has no copper alloy piping, piping components, or piping elements containing >15% Zn exposed to closed cycle cooling water in the ESF Systems.

Table 3.2.1 Summary of Aging Management Evaluations for the Engineered Safety Features

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.2.1-19	Gray cast iron motor cooler exposed to treated water	Loss of material due to selective leaching	Selective Leaching of Materials	No	Consistent with NUREG-1801. Oyster Creek will use the Selective Leaching of Materials program, B.1.25, which uses one-time inspections to determine if loss of material due to selective leaching is occurring to the cast iron pump housing in a treated water environment in the Containment Spray System.
3.2.1-20	High-strength steel closure bolting exposed to air with steam or water leakage	Cracking due to cyclic loading, stress corrosion cracking	Bolting Integrity	No	Not Applicable. Oyster Creek ha no high-strength steel closure bolting in the ESF Systems.
3.2.1-21	Stainless steel piping, piping components, piping elements, and heat exchanger shell side components (including tubes) serviced by closed-cycle cooling system	Loss of material due to pitting and crevice corrosion	Closed-Cycle Cooling Water System	No	Not Applicable. Oyster Creek has no stainless steel piping, piping components, piping elements, or heat exchanger shell side components including tubes exposed to a closed cycle cooling water environment in the ESF Systems.

Table 3.2.1 Summary of Aging Management Evaluations for the Engineered Safety Features

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.2.1-22	Stainless steel heat exchanger tubes exposed to closed cycle cooling water	Reduction of heat transfer due to fouling	Closed-Cycle Cooling Water System	No	Not Applicable. Oyster Creek has no stainless steel heat exchanger tubes exposed to a closed cycle cooling water environment in the ESF Systems.
3.2.1-23	Stainless steel heat exchanger shell side components (including tubes) exposed to raw water	Loss of material due to pitting, crevice, and microbiologically influenced corrosion, and fouling	Open-Cycle Cooling Water System	No	Not Applicable. Oyster Creek has no stainless steel heat exchanger shell side components including tubes exposed to a raw water environment in the ESF Systems.
3.2.1-24	Stainless steel heat exchanger tubes exposed to treated water	Reduction of heat transfer due to fouling	Water Chemistry	No	Consistent with NUREG-1801, with exceptions. The Water Chemistry program, B.1.2, will be used to manage reduction of heat transfer due to fouling of stainless steel heat exchanger tubes in the Isolation Condenser System exposed to treated water. Exceptions apply to the NUREG-1801 recommendations for Water Chemistry program implementation.
3.2.1-25	Steel bolting and closure bolting exposed to air with steam or water leakage, air – outdoor (external), or air – indoor uncontrolled	Loss of material due to general, pitting and crevice corrosion; loss of preload due to stress relaxation	Bolting Integrity	No	Oyster Creek will implement a Bolting Integrity program, B.1.12, to inspect steel bolting in an indoor air, outdoor air, and containment atmosphere environment for various systems. The program manages aging effects in the systems by performing visual inspections for pressure retaining bolted joint leakage. The

Table 3.2.1 Summary of Aging Management Evaluations for the Engineered Safety Features

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
	(external)				activities are implemented through station procedures. Oyster Creek will implement a Structures Monitoring Program, B.1.31, to inspect the steel closure bolting in an outdoor air external environment of ductwork in the Standby Gas Treatment System for loss of material. The Structures Monitoring Program relies on periodic visual inspections to identify and evaluate the degradation of external surfaces of the bolting to ensure that there is no loss of intended function. Oyster Creek will use the 10 CFR Part 50, Appendix J program, B.1.29, to demonstrate leak-tightness and structural integrity of primary containment pressure retaining bolting. The ASME Section XI, Subsection IWE program, B.1.27, will be used in addition to visually inspect this bolting for loss of material.
3.2.1-26	Steel heat exchanger shell side components exposed to closed cycle cooling water	Loss of material due to general, pitting and crevice corrosion	Closed-Cycle Cooling Water System	No	Not Applicable. Oyster Creek has no steel heat exchanger shell side components exposed to closed cycle cooling water in the ESF Systems.

Table 3.2.1 Summary of Aging Management Evaluations for the Engineered Safety Features

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.2.1-27	Steel heat exchanger shell side components (including tubes) exposed to raw water	Loss of material due to general, pitting, crevice, and microbiologically influenced corrosion, and fouling	Open-Cycle Cooling Water System	No	Not Applicable. Oyster Creek has no steel heat exchanger shell side components including tubes exposed to raw water in the ESF Systems.
3.2.1-28	Steel and stainless steel heat exchanger tubes (serviced by open-cycle cooling water) exposed to raw water	Reduction of heat transfer due to fouling	Open-Cycle Cooling Water System	No	Not Applicable. Oyster Creek has no steel or stainless steel heat exchanger tubes exposed to open cycle cooling water or raw water in the ESF Systems.
3.2.1-29	PWR Only				
3.2.1-30	PWR Only				
3.2.1-31	PWR Only				

Table 3.2.1 Summary of Aging Management Evaluations for the Engineered Safety Features

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.2.1-32	Aluminum piping, piping components, and piping elements exposed to air- indoor uncontrolled (internal/external)	None	None	NA - No AEM or AMP	Consistent with NUREG-1801.
3.2.1-33	Glass piping, piping components, and piping elements exposed to air – indoor uncontrolled (external), lubricating oil, raw water, or treated borated water	None	None	NA - No AEM or AMP	Consistent with NUREG-1801.
3.2.1-34	Stainless steel piping, piping components, and piping elements exposed to concrete or lubricating oil	None	None	NA - No AEM or AMP	Consistent with NUREG-1801.

Table 3.2.1 Summary of Aging Management Evaluations for the Engineered Safety Features

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.2.1-35	Stainless steel, cast austenitic stainless steel, galvanized steel, copper alloy, 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.
3.2.1-36	Steel piping, piping components, and piping elements exposed to air – indoor controlled (external), or concrete	None	None	NA - No AEM or AMP	Not Applicable. Oyster Creek has no steel piping, piping components, or piping elements exposed to an air-indoor controlled (external) environment or concrete environment in the ESF Systems.
3.2.1-37	Steel and copper alloy piping, piping components, and piping elements exposed to lubricating oil (no water pooling)	None	None	NA - No AEM or AMP	Not Applicable. Oyster Creek has no steel or copper alloy piping, piping components, or piping elements exposed to a lubrication oil (no water pooling) environment in the ESF Systems.

Table 3.2.1 Summary of Aging Management Evaluations for the Engineered Safety Features

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.2.1-38	Steel, stainless steel, and copper alloy piping, piping components, and piping elements exposed to gas	None	None	NA - No AEM or AMP	Not Applicable. Oyster Creek has no steel, stainless steel, or copper alloy piping, piping components, or piping elements exposed to a gas environment in the ESF Systems.
3.2.1-39	PWR Only				
3.2.1-40	PWR Only				

Table 3.2.2.1.1
Containment Spray System
Summary of Aging Management Evaluation

Table 3.2.2.1.1 Containment Spray System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Containment Atmosphere (External)	Loss of Material	Bolting Integrity (B.1.12)	V.E-4 (EP-25)	3.2.1-25	B, 3
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B
			Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	V.E-4 (EP-25)	3.2.1-25	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B
		Carbon and low alloy steel	Containment Atmosphere (External)	Loss of Material	Bolting Integrity (B.1.12)	V.E-4 (EP-25)	3.2.1-25	B, 3
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B
			Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	V.E-4 (EP-25)	3.2.1-25	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B

Table 3.2.2.1.1 Containment Spray System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flow Element	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
Heat Exchangers (Cont. Spray)								6
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Soil (External)	Loss of Material	Buried Piping Inspection (B.1.26)	V.B-8 (E-42)	3.2.1-12	B
	Pressure Boundary	Carbon and low alloy steel	Containment Atmosphere (External)	None	None	V.C-1 (E-35)	3.2.1-2	I, 1
			Containment Atmosphere (Internal)	None	None	V.C-1 (E-35)	3.2.1-2	I, 1
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.E-7 (E-44)	3.2.1-2	E
			Treated Water <140F (Internal)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	V.D2-26 (E-10)	3.2.1-1	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-27 (E-08)	3.2.1-10	A

Table 3.2.2.1.1 Containment Spray System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Carbon and low alloy steel	Treated Water <140F (Internal)	Loss of Material	Periodic Testing of Containment Spray Nozzles (B.2.1)	V.D2-27 (E-08)	3.2.1-10	E, 5
					Water Chemistry (B.1.2)	V.D2-27 (E-08)	3.2.1-10	B, 2
		Stainless Steel	Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Treated Water <140F (Internal)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	V.D2-22 (E-16)	3.2.1-1	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
Pump Casing	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.E-7 (E-44)	3.2.1-2	E
			Treated Water < 140F (External)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-27 (E-08)	3.2.1-10	A
					Water Chemistry (B.1.2)	V.D2-27 (E-08)	3.2.1-10	B
		Cast Iron	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.E-7 (E-44)	3.2.1-2	E

Table 3.2.2.1.1 Containment Spray System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pump Casing	Pressure Boundary	Cast Iron	Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-27 (E-08)	3.2.1-10	A
					Selective Leaching of Materials (B.1.25)	V.A-12 (E-43)	3.2.1-19	C
					Water Chemistry (B.1.2)	V.D2-27 (E-08)	3.2.1-10	B
Spray Nozzle	Pressure Boundary	Stainless Steel	Containment Atmosphere (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Containment Atmosphere (Internal)	None	None			G, 4
	Spray	Stainless Steel	Containment Atmosphere (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Containment Atmosphere (Internal)	None	None			G, 4
Strainer (ECCS Suction)	Filter	Stainless Steel	Treated Water < 140F (External)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E

Table 3.2.2.1.1 Containment Spray System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Strainer (ECCS Suction)	Filter	Stainless Steel	Treated Water <140F (Internal)	Loss of Material	Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
	Pressure Boundary	Stainless Steel	Treated Water < 140F (External)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
Thermowell	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.E-7 (E-44)	3.2.1-2	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-27 (E-08)	3.2.1-10	A
					Water Chemistry (B.1.2)	V.D2-27 (E-08)	3.2.1-10	B
Valve Body	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.E-7 (E-44)	3.2.1-2	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-27 (E-08)	3.2.1-10	A

Table 3.2.2.1.1 Containment Spray System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Carbon and low alloy steel	Treated Water <140F (Internal)	Loss of Material	Water Chemistry (B.1.2)	V.D2-27 (E-08)	3.2.1-10	B
		Stainless Steel	Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. Based on past precedence (NUREG-1796, Dresden and Quad Cities SER, paragraph 3.1.2.4.1), the Staff concluded that the loss of material due to corrosion is not considered a credible aging effect for carbon steel components in a containment nitrogen environment because of negligible amounts of free oxygen (less than 4 percent by volume during normal operation). Both oxygen and moisture must be present for general corrosion to occur because oxygen alone or water free of dissolved oxygen (high humidity in a nitrogen atmosphere) does not corrode carbon steel to any practical extent. The staff found the applicant’s identification of no loss of material for the carbon steel components exposed to a containment nitrogen environment acceptable because, with the negligible amounts of free oxygen, anodic reactions do not take place and the corrosion cell does not form. Therefore, no loss of material due to corrosion takes place and the aging effect is none.
2. Line item V.D2-28 (E-09) for flow-accelerated corrosion is not an applicable aging mechanism as this is a low temperature system.
3. The Aging Management Program for the Aging Effect of "Loss of Material" for the environment of Indoor Air (External) as identified in the referenced NUREG-1801 Volume 2 item was applied to the environment of Containment Atmosphere (External). Aging effects due to exposure to containment atmosphere are bounded by those due to exposure to indoor air, since the containment nitrogen environment is not conducive to promoting aging degradation.
4. NUREG-1801 Volume 2 item V.F-14 (EP-18) lists no aging effect or required Aging Management Program for stainless steel in the air-indoor uncontrolled (external) environment. This has been applied to the spray nozzle internal environment.

5. The Periodic Testing of the Containment Spray Nozzles aging management program conducts periodic tests to verify that the drywell and torus spray nozzles are free from plugging that could result from corrosion product buildup from upstream carbon steel piping sources.
6. The Containment Spray Heat Exchangers are evaluated with the Emergency Service Water System.

Table 3.2.2.1.2
Core Spray System
Summary of Aging Management Evaluation

Table 3.2.2.1.2 Core Spray System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Containment Atmosphere (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 4
			Indoor Air (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
						V.E-4 (EP-25)	3.2.1-25	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B
						V.E-5 (EP-24)	3.2.1-25	B, 4

Table 3.2.2.1.2 Core Spray System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Containment Atmosphere (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 4
			Indoor Air (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
						V.E-4 (EP-25)	3.2.1-25	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B
						V.E-5 (EP-24)	3.2.1-25	B, 4
Cyclone Separator	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E

Table 3.2.2.1.2 Core Spray System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Cyclone Separator	Pressure Boundary	Stainless Steel	Treated Water <140F (Internal)	Loss of Material	Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
Flow Element	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
Gauge Snubber	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.D2-2 (E-26)	3.2.1-2	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-27 (E-08)	3.2.1-10	A
					Water Chemistry (B.1.2)	V.D2-27 (E-08)	3.2.1-10	B

Table 3.2.2.1.2 Core Spray System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.D2-2 (E-26)	3.2.1-2	E
			Treated Water <140F (Internal)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	V.D2-26 (E-10)	3.2.1-1	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-27 (E-08)	3.2.1-10	A
					Water Chemistry (B.1.2)	V.D2-27 (E-08)	3.2.1-10	B, 3
		Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Indoor Air (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-1 (R-03)	3.1.1-9	B
						IV.C1-2 (R-55)	3.1.1-21	B
						IV.C1-9 (R-22)	3.1.1-32	E, 1

Table 3.2.2.1.2 Core Spray System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking Initiation and Growth	BWR Stress Corrosion Cracking (B.1.7)	IV.C1-9 (R-22)	3.1.1-32	B
					One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	A
						IV.C1-2 (R-55)	3.1.1-21	A
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	B
						IV.C1-9 (R-22)	3.1.1-32	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
						V.D2-22 (E-16)	3.2.1-1	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
Pump Casing (Fill Pumps)	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.D2-2 (E-26)	3.2.1-2	E

Table 3.2.2.1.2 Core Spray System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pump Casing (Fill Pumps)	Pressure Boundary	Carbon and low alloy steel	Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-27 (E-08)	3.2.1-10	A
					Water Chemistry (B.1.2)	V.D2-27 (E-08)	3.2.1-10	B
Pump Casing (Main and Booster Pumps)	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.D2-2 (E-26)	3.2.1-2	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-27 (E-08)	3.2.1-10	A
					Water Chemistry (B.1.2)	V.D2-27 (E-08)	3.2.1-10	B
Restricting Orifice	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E
	Throttle	Stainless Steel	Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E

Table 3.2.2.1.2 Core Spray System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Sight Glasses	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.D2-2 (E-26)	3.2.1-2	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-27 (E-08)	3.2.1-10	A
					Water Chemistry (B.1.2)	V.D2-27 (E-08)	3.2.1-10	B
		Glass	Indoor Air (External)	None	None	V.F-8 (EP-15)	3.2.1-33	A
			Treated Water (Internal)	None	None	V.F-12 (EP-16)	3.2.1-33	A
Thermowell	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.D2-2 (E-26)	3.2.1-2	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-27 (E-08)	3.2.1-10	A
					Water Chemistry (B.1.2)	V.D2-27 (E-08)	3.2.1-10	B
Valve Body	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.D2-2 (E-26)	3.2.1-2	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-27 (E-08)	3.2.1-10	A

Table 3.2.2.1.2 Core Spray System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Carbon and low alloy steel	Treated Water <140F (Internal)	Loss of Material	Water Chemistry (B.1.2)	V.D2-27 (E-08)	3.2.1-10	B
		CASS	Containment Atmosphere (External)	None	None	IV.E-1 (RP-02)	3.1.1-71	A
			Indoor Air (External)	None	None	IV.E-1 (RP-02)	3.1.1-71	A
			Treated Water (Internal)	Cracking Initiation and Growth	BWR Stress Corrosion Cracking (B.1.7)	IV.C1-10 (R-20)	3.1.1-32	B
					Water Chemistry (B.1.2)	IV.C1-10 (R-20)	3.1.1-32	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E, 2
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E, 2
		Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Indoor Air (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A

Table 3.2.2.1.2 Core Spray System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking Initiation and Growth	BWR Stress Corrosion Cracking (B.1.7)	IV.C1-9 (R-22)	3.1.1-32	B
					One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	E, 5, 6
						IV.C1-2 (R-55)	3.1.1-21	E, 5, 6
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	E, 5, 6
						IV.C1-9 (R-22)	3.1.1-32	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The program for ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD is credited in addition to the NUREWG-1801 recommended programs for this item.
2. CASS material for this item is assumed to be a subset of "Stainless Steel" for this Aging Effect.
3. Line item V.D2-28 (E-09) for flow-accelerated corrosion is not an applicable aging mechanism as this is a low temperature system.
4. Line item IV.C1-12 (R-27) for loss of preload for RCPB closure bolting does not apply since the A 193 B7 alloy steel closure bolting is not high-strength. Line item V.E-5 (EP-24) has been applied to the loss of preload aging effect for RCPB closure bolting.
5. The applicable Aging Management Programs recommended in NUREG 1801 for Class 1 stainless steel piping, fittings, and branch connections < 4 in. N.P.S. are also specified here for Class 1 valve bodies < 4 in. N.P.S.
6. ASME Secton XI Inservice Inspection, Subsections IWB, IWC, and IWD does not apply to cracking of these valves.

Table 3.2.2.1.3
Standby Gas Treatment System (SGTS)
Summary of Aging Management Evaluation

Table 3.2.2.1.3 Standby Gas Treatment System (SGTS)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.B-1 (E-40)	3.2.1-11	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.E-1 (EP-1)	3.2.1-25	E, 1
		Stainless Steel	Indoor Air (External)	None	None			G, 3
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	A
Damper Housing	Pressure Boundary	Carbon and low alloy steel	Indoor Air (Internal)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	V.B-3 (E-25)	3.2.1-2	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.E-8 (E-45)	3.2.1-2	E
Door Seal	Pressure Boundary	Elastomer	Indoor Air (External)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)	V.B-4 (E-06)	3.2.1-6	E
				Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F3-8 (A-73)	3.3.1-28	E

Table 3.2.2.1.3 Standby Gas Treatment System (SGTS) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Door Seal	Pressure Boundary	Elastomer	Indoor Air (Internal)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)	V.B-4 (E-06)	3.2.1-6	E
				Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F3-9 (A-18)	3.3.1-28	E
			Outdoor Air (External)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)			G
				Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G
Ductwork	Pressure Boundary	Aluminum	Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	C
			Indoor Air (Internal)	None	None	V.F-2 (EP-3)	3.2.1-32	C
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B2-6 (TP-6)	3.5.1-33	C
			Soil (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G, 2
		Plexiglass	Indoor Air (External)	None	None			F, 4
			Indoor Air (Internal)	None	None			F, 4

Table 3.2.2.1.3 Standby Gas Treatment System (SGTS) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Fan Housing	Pressure Boundary	Carbon and low alloy steel	Indoor Air (Internal)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	V.B-3 (E-25)	3.2.1-2	E
			Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	V.E-8 (E-45)	3.2.1-2	E
Filter Housing	Pressure Boundary	Galvanized Steel	Indoor Air (External)	None	None	V.F-1 (EP-14)	3.2.1-35	A
			Indoor Air (Internal)	None	None	V.F-1 (EP-14)	3.2.1-35	A
		Stainless Steel	Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	C
			Indoor Air (Internal)	None	None	V.F-14 (EP-18)	3.2.1-35	C
Flexible Connection	Pressure Boundary	Elastomer	Indoor Air (Internal)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)	V.B-4 (E-06)	3.2.1-6	E
			Outdoor Air (External)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)			G
Flow Element	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	C
			Indoor Air (Internal)	None	None	V.F-14 (EP-18)	3.2.1-35	C

Table 3.2.2.1.3 Standby Gas Treatment System (SGTS) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flow Element	Pressure Boundary	Stainless Steel	Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G
Heater Housing	Pressure Boundary	Aluminum	Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	C
			Indoor Air (Internal)	None	None	V.F-2 (EP-3)	3.2.1-32	C
Piping and fittings	Pressure Boundary	Brass	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Indoor Air (Internal)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G
		Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	V.B-2 (E-26)	3.2.1-2	E
			Indoor Air (Internal)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	V.B-3 (E-25)	3.2.1-2	E
		Copper	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Indoor Air (Internal)	None	None	V.F-4 (EP-10)	3.2.1-35	A

Table 3.2.2.1.3 Standby Gas Treatment System (SGTS) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Copper	Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G
		Stainless Steel	Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Indoor Air (Internal)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G
Restricting Orifice	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	V.B-2 (E-26)	3.2.1-2	E
			Indoor Air (Internal)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	V.B-3 (E-25)	3.2.1-2	E
	Throttle	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	V.B-2 (E-26)	3.2.1-2	E
			Indoor Air (Internal)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	V.B-3 (E-25)	3.2.1-2	E
Thermowell	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Indoor Air (Internal)	None	None	V.F-14 (EP-18)	3.2.1-35	A

Table 3.2.2.1.3 Standby Gas Treatment System (SGTS) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Thermowell	Pressure Boundary	Stainless Steel	Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G
Valve Body	Pressure Boundary	Brass	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Indoor Air (Internal)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G
		Cast Iron	Indoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	V.B-2 (E-26)	3.2.1-2	E
			Indoor Air (Internal)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	V.B-3 (E-25)	3.2.1-2	E
			Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	V.E-8 (E-45)	3.2.1-2	E

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. Ventilation system duct bolting is similar to structural bolting in that it provides structural support for ventilation system assemblies, which is functionally different from piping system pressure retaining closure bolting. The Bolting Integrity program does not provide for long-term condition monitoring inspections of ventilation duct bolting. Therefore, the Structures Monitoring Program is appropriate to detect and manage the aging effects of ventilation system duct bolting by periodic visual inspection.
2. The external surface of the buried ductwork is not accessible for visual inspection by the Structures Monitoring Program. Aging management for this portion of the ductwork exterior surface is incorporated into the Ventilation System Periodic Inspection Aging Management Program.
3. The aging effects for stainless steel ventilation closure bolting in an indoor environment is none. This is consistent with industry guidance.
4. The aging effects for plexiglass (lexan) in an indoor environment (Ventilation Tunnel) is none. This is consistent with industry guidance.

3.3 AGING MANAGEMENT OF AUXILARY SYSTEMS

3.3.1 INTRODUCTION

This section provides the results of the aging management review for those components identified in Section 2.3.3, Auxiliary Systems, as being subject to aging management review. The systems, or portions of systems, which are addressed in this section are described in the indicated sections.

- “C” Battery Room Heating & Ventilation (2.3.3.1)
- 4160 V Switchgear Room Ventilation (2.3.3.2)
- 480 V Switchgear Room Ventilation (2.3.3.3)
- Battery and MG Set Room Ventilation (2.3.3.4)
- Chlorination System (2.3.3.5)
- Circulating Water System (2.3.3.6)
- Containment Inerting System (2.3.3.7)
- Containment Vacuum Breakers (2.3.3.8)
- Control Rod Drive System (2.3.3.9)
- Control Room HVAC (2.3.3.10)
- Cranes and Hoists (2.3.3.11)
- Drywell Floor and Equipment Drains (2.3.3.12)
- Emergency Diesel Generator and Auxiliary System (2.3.3.13)
- Emergency Service Water System (2.3.3.14)
- Fire Protection System (2.3.3.15)
- Fuel Storage and Handling Equipment (2.3.3.16)
- Hardened Vent System (2.3.3.17)
- Heating & Process Steam System (2.3.3.18)
- Hydrogen & Oxygen Monitoring System (2.3.3.19)
- Instrument (Control) Air System (2.3.3.20)
- Main Fuel Oil Storage & Transfer System (2.3.3.21)
- Miscellaneous Floor and Equipment Drain System (2.3.3.22)
- Nitrogen Supply System (2.3.3.23)
- Noble Metals Monitoring System (2.3.3.24)
- Post-Accident Sampling System (2.3.3.25)
- Process Sampling System (2.3.3.26)
- Radiation Monitoring System (2.3.3.27)
- Radwaste Area Heating and Ventilation System (2.3.3.28)
- Reactor Building Closed Cooling Water System (2.3.3.29)
- Reactor Building Floor and Equipment Drains (2.3.3.30)
- Reactor Building Ventilation System (2.3.3.31)
- Reactor Water Cleanup System (2.3.3.32)
- Roof Drains and Overboard Discharge (2.3.3.33)
- Sanitary Waste System (2.3.3.34)
- Service Water System (2.3.3.35)
- Shutdown Cooling System (2.3.3.36)
- Spent Fuel Pool Cooling System (2.3.3.37)
- Standby Liquid Control System (Liquid Poison System) (2.3.3.38)

- Traveling In-Core Probe System (2.3.3.39)
- Turbine Building Closed Cooling Water System (2.3.3.40)
- Water Treatment & Distribution System (2.3.3.41)

3.3.2 RESULTS

3.3.2.1 Materials, Environments, Aging Effects Requiring Management And Aging Managements Programs For The Auxiliary Systems

3.3.2.1.1 “C” Battery Room Heating & Ventilation

Materials

The materials of construction for the “C” Battery Room Heating & Ventilation components are:
- Brass
- Carbon and low alloy steel
- Copper
- Elastomer
- Galvanized Steel
- Stainless Steel

Environments

The “C” Battery Room Heating & Ventilation components are exposed to the following environments:
- Indoor Air
- Outdoor Air

Aging Effects Requiring Management

The following aging effects associated with the “C” Battery Room Heating & Ventilation components require management:
- Change in Material Properties
- Loss Of Material

Aging Management Programs

The following aging management programs manage the aging effects for the “C” Battery Room Heating & Ventilation components:
- Periodic Inspection of Ventilation Systems
- Structures Monitoring Program

Table 3.3.2.1.1, Summary of Aging Management Evaluation – “C” Battery Room Heating & Ventilation the results of the aging management review for the “C” Battery Room Heating & Ventilation.

3.3.2.1.2 4160 V Switchgear Room Ventilation

Materials

The materials of construction for the 4160 V Switchboard Room Ventilation components are:

- Aluminum
- Carbon and low alloy steel
- Galvanized Steel
- Stainless Steel

Environments

The 4160 V Switchboard Room Ventilation components are exposed to the following environments:

- Indoor Air

Aging Effects Requiring Management

The following aging effects associated with the 4160 V Switchboard Room Ventilation components require management:

- Loss Of Material

Aging Management Programs

The following aging management programs manage the aging effects for the 4160 V Switchboard Room Ventilation components:

- Structures Monitoring Program

Table 3.3.2.1.2, Summary of Aging Management Evaluation – 4160 V Switchboard Room Ventilation summarizes the results of the aging management review for the 4160 V Switchboard Room Ventilation.

3.3.2.1.3 480 V Switchgear Room Ventilation

Materials

The materials of construction for the 480 V Switchgear Room Ventilation components are:

- Aluminum
- Brass
- Carbon and low alloy steel
- Copper
- Elastomer
- Galvanized Steel
- Stainless Steel

Environments

The 480 V Switchgear Room Ventilation components are exposed to the following environments:

- Indoor Air
- Outdoor Air

Aging Effects Requiring Management

The following aging effects associated with the 480 V Switchgear Room Ventilation components require management:

- Change in Material Properties
- Loss Of Material

Aging Management Programs

The following aging management programs manage the aging effects for the 480 V Switchgear Room Ventilation components:

- Periodic Inspection of Ventilation Systems
- Structures Monitoring Program

Table 3.3.2.1.3, Summary of Aging Management Evaluation – 480 V Switchgear Room Ventilation summarizes the results of the aging management review for the 480 V Switchgear Room Ventilation

3.3.2.1.4 Battery and MG Set Room Ventilation

Materials

The materials of construction for the Battery and MG Set Room Ventilation components are:

- Aluminum
- Brass
- Carbon and low alloy steel
- Copper
- Elastomer
- Galvanized Steel
- Stainless Steel

Environments

The Battery and MG Set Room Ventilation components are exposed to the following environments:

- Indoor Air
- Outdoor Air

Aging Effects Requiring Management

The following aging effects associated with the Battery and MG Set Room Ventilation require management

- Change in Material Properties
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Battery and MG Set Room Ventilation components:

- Periodic Inspection of Ventilation Systems
- Structures Monitoring Program

Table 3.3.2.1.4, Summary of Aging Management Evaluation – Battery and MG Set Room Ventilation summarizes the results of the aging management review for the Battery and MG Set Room Ventilation.

3.3.2.1.5 Chlorination System

Materials

The materials of construction for the Chlorination System components are:

- Carbon and low alloy steel
- Cast Iron
- Polypropylene
- Polyvinyl Chloride (PVC, CPVC)

Environments

The Chlorination System components are exposed to the following environments:

- Indoor Air
- Outdoor Air
- Raw Water – Salt Water

Aging Effects Requiring Management

The following aging effects associated with the Chlorination System require management

- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Chlorination System components:

- Bolting Integrity
- Open-Cycle Cooling Water System
- Selective Leaching of Materials
- Structures Monitoring Program

Table 3.3.2.1.5, Summary of Aging Management Evaluation – Chlorination System summarizes the results of the aging management review for the Chlorination System.

3.3.2.1.6 Circulating Water System

Materials

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

- Alloy Steel
- Brass
- Bronze
- Carbon and low alloy steel
- Cast Iron
- Copper
- Copper Alloy
- Elastomer
- Glass
- Stainless Steel

Environments

The Circulating Water System components are exposed to the following environments:

- Indoor Air
- Raw Water – Salt Water

Aging Effects Requiring Management

The following aging effects associated with the Circulating Water System components require management:

- Change in Material Properties
- Loss of Material
- Loss of Preload

Aging Management Programs

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

- Bolting Integrity
- Periodic Inspection Program
- Selective Leaching of Materials
- Structures Monitoring Program

Table 3.3.2.1.6, Summary of Aging Management Evaluation – Circulating Water System summarizes the results of the aging management review for the Circulating Water System.

3.3.2.1.7 Containment Inerting System

Materials

The materials of construction for the Containment Inerting System components are:

- Alloy Steel
- Carbon and low alloy steel
- Cast Iron
- Copper
- Copper Alloy
- Stainless Steel

Environments

The Containment Inerting System components are exposed to the following environments:

- Condensation
- Containment Atmosphere
- Dry Gas
- Indoor Air
- Outdoor Air

Aging Effects Requiring Management

The following aging effects associated with the Containment Inerting System components require management:

- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Containment Inerting System components:

- Bolting Integrity
- Periodic Inspection Program
- Selective Leaching of Materials
- Structures Monitoring Program

Table 3.3.2.1.7, Summary of Aging Management Evaluation – Containment Inerting System summarizes the results of the aging management review for the Containment Inerting System.

3.3.2.1.8 Containment Vacuum Breakers

Materials

The materials of construction for the Containment Vacuum Breakers components are:

- Carbon and low allow steel
- Stainless Steel

Environments

The Containment Vacuum Breakers components are exposed to the following environments:

- Containment Atmosphere

- Indoor Air
- Treated Water <140F

Aging Effects Requiring Management

The following aging effects associated with the Containment Vacuum Breakers components require management:

- Cracking Initiation and Growth
- Cumulative Fatigue Damage (TLAA)
- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Containment Vacuum Breakers components:

- 10 CFR Part 50, Appendix J
- ASME Section XI, Subsection IWE
- One-Time Inspection
- Structures Monitoring Program
- Water Chemistry

Table 3.3.2.1.8, Summary of Aging Management Evaluation – Containment Vacuum Breakers summarizes the results of the aging management review for the Containment Vacuum Breakers.

3.3.2.1.9 Control Rod Drive System

Materials

The materials of construction for the Control Rod Drive System components are:

- Alloy Steel
- Brass
- Carbon and low alloy steel
- High Strength Alloy Steel
- Stainless Steel

Environments

The Control Rod Drive System components are exposed to the following environments:

- Containment Atmosphere
- Dry Gas
- Indoor Air
- Lubricating Oil
- Treated Water
- Treated Water <140F

Aging Effects Requiring Management

The following aging effects associated with the Control Rod Drive System components require management:

- Cracking Initiation and Growth
- Cumulative Fatigue Damage (TLAA)
- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Control Rod Drive System components:

- ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD
- Bolting Integrity
- Lubricating Oil Monitoring Activities
- One-Time Inspection
- Selective Leaching of Materials
- Structures Monitoring Program
- Water Chemistry

Table 3.3.2.1.9, Summary of Aging Management Evaluation – Control Rod Drive System summarizes the results of the aging management review for the Control Rod Drive System.

3.3.2.1.10 Control Room HVAC

Materials

The materials of construction for the Control Room HVAC components are:

- Aluminum
- Brass
- Carbon and low alloy steel
- Copper
- Elastomer
- Galvanized Steel
- Polyvinyl Chloride (PVC, CPVC)
- Stainless Steel

Environments

The Control Room HVAC components are exposed to the following environments:

- Indoor Air
- Outdoor Air
- Raw Water – Fresh Water
- Refrigerant

Aging Effects Requiring Management

The following aging effects associated with the Control Room HVAC components require management:

- Change in Material Properties
- Loss of Material
- Reduction of Heat Transfer

Aging Management Programs

The following aging management programs manage the aging effects for the Control Room HVAC components:

- Periodic Inspection of Ventilation Systems
- Structures Monitoring Program

Table 3.3.2.1.10, Summary of Aging Management Evaluation – Control Room HVAC summarizes the results of the aging management review for the Control Room HVAC.

3.3.2.1.11 Cranes and Hoists

Materials

The materials of construction for the Cranes and Hoists components are:

- Carbon and low alloy steel

Environments

The Cranes and Hoists components are exposed to the following environments:

- Indoor Air
- Outdoor Air

Aging Effects Requiring Management

The following aging effects associated with the Cranes and Hoists components require management:

- Cumulative Fatigue Damage (TLAA)
- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Cranes and Hoists components:

- Inspection of Overhead Heavy Load and Light Load (Related to Fuel Handling) Handling Systems

Table 3.3.2.1.11, Summary of Aging Management Evaluation – Cranes and Hoists summarizes the results of the aging management review for the Cranes and Hoists

3.3.2.1.12 Drywell Floor and Equipment Drains

Materials

The materials of construction for the Drywell Floor and Equipment Drains components are:
- Alloy Steel
- Carbon and low alloy steel
- Cast Iron
- Glass
- Stainless Steel

Environments

The Drywell Floor and Equipment Drains components are exposed to the following environments:
- Containment Atmosphere
- Indoor Air
- Raw Water – Fresh Water
- Soil

Aging Effects Requiring Management

The following aging effects associated with the Drywell Floor and Equipment Drains components require management:
- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Drywell Floor and Equipment Drains components:
- Bolting Integrity
- Buried Piping Inspection
- One-Time Inspection
- Selective Leaching of Materials
- Structures Monitoring Program

Table 3.3.2.1.12, Summary of Aging Management Evaluation – Drywell Floor and Equipment Drains summarizes the results of the aging management review for the Drywell Floor and Equipment Drains.

3.3.2.1.13 Emergency Diesel Generator and Auxiliary System

Materials

The materials of construction for the Emergency Diesel Generator and Auxiliary System components are:
- Aluminum
- Brass
- Carbon and low alloy steel

- Galvanized Steel
- Glass
- Stainless Steel

Environments

The Emergency Diesel Generator and Auxiliary System components are exposed to the following environments:

- Closed Cooling Water
- Concrete
- Condensation
- Diesel Engine Exhaust Gases
- Fuel Oil
- Indoor Air
- Lubricating Oil
- Oil
- Outdoor Air

Aging Effects Requiring Management

The following aging effects associated with the Emergency Diesel Generator and Auxiliary System components require management:

- Loss of Material
- Loss of Preload
- Reduction of Heat Transfer

Aging Management Programs

The following aging management programs manage the aging effects for the Emergency Diesel Generator and Auxiliary System components:

- Above Ground Outdoor Tanks
- Bolting Integrity
- Closed Cycle Cooling water System
- Fuel Oil Chemistry
- Lubricating Oil Monitoring Activities
- One-Time Inspection
- Periodic Inspection Program
- Selective Leaching of Materials
- Structures Monitoring Program

Table 3.3.2.1.13, Summary of Aging Management Evaluation – Emergency Diesel Generator and Auxiliary System summarizes the results of the aging management review for the Emergency Diesel Generator and Auxiliary System.

3.3.2.1.14 Emergency Service Water System

Materials

The materials of construction for the Emergency Service Water System components are:

- Alloy Steel
- Aluminum Bronze
- Brass
- Bronze
- Carbon and low alloy steel
- Copper Alloy
- Elastomer
- Glass
- Nickel Alloy
- Stainless Steel
- Titanium

Environments

The Emergency Service Water System components are exposed to the following environments:

- Indoor Air
- Outdoor Air
- Raw Water – Salt Water
- Soil
- Treated Water

Aging Effects Requiring Management

The following aging effects associated with the Emergency Service Water System components require management:

- Change in Material Properties
- Loss of Material
- Loss of Preload
- Reduction of Heat Transfer

Aging Management Programs

The following aging management programs manage the aging effects for the Emergency Service Water System components:

- Bolting Integrity
- Buried Piping Inspection
- One-Time Inspection
- Open-Cycle Cooling Water System
- Periodic Inspection Program
- Selective Leaching of Materials
- Structures Monitoring Program
- Water Chemistry

Table 3.3.2.1.14, Summary of Aging Management Evaluation – Emergency Service Water System summarizes the results of the aging management review for the Emergency Service Water System.

3.3.2.1.15 Fire Protection System

Materials

The materials of construction for the Fire Protection System components are:

- Aluminum
- Aluminum Silica
- Brass
- Bronze
- Carbon and low alloy steel
- Cast Iron
- Concrete
- Copper
- Copper Alloy
- Elastomer
- Grout
- Gypsum Board
- Mecatiss
- Polyethylene
- Pyrocrete
- Stainless Steel
- Thermo-Lag

Environments

The Fire Protection System components are exposed to the following environments:

- Dry Gas
- Fuel Oil
- Indoor Air
- Lubricating Oil
- Outdoor Air
- Raw Water – Fresh Water
- Soil

Aging Effects Requiring Management

The following aging effects associated with the Fire Protection System components require management:

- Change in Material Properties
- Cracking
- Loss of Material
- Loss of Preload
- Reduction of Heat Transfer

Aging Management Programs

The following aging management programs manage the aging effects for the Fire Protection System components:

- Aboveground Outdoor Tanks
- Bolting Integrity
- Buried Piping Inspection
- Fire Protection
- Fire Water System
- Fuel Oil Chemistry
- Lubricating Oil Monitoring Activities
- One-Time Inspection
- Periodic Inspection Program
- Selective Leaching of Materials
- Structures Monitoring Program

Table 3.3.2.1.15, Summary of Aging Management Evaluation – Fire Protection System summarizes the results of the aging management review for the Fire Protection System.

3.3.2.1.16 Fuel Storage and Handling Equipment

Materials

The materials of construction for the Fuel Storage and Handling Equipment components are:

- Aluminum
- Boraflex
- Boral
- Carbon and low alloy steel
- Stainless Steel

Environments

The Fuel Storage and Handling Equipment components are exposed to the following environments:

- Indoor Air
- Treated Water <140F

Aging Effects Requiring Management

The following aging effects associated with the Fuel Storage and Handling Equipment components require management:

- Loss of Material
- Loss of Preload
- Reduction of Neutron-Absorbing Capacity

Aging Management Programs

The following aging management programs manage the aging effects for the Fuel Storage and Handling Equipment components:

- Boraflex Rack Management Program
- Inspection of Overhead Heavy Load and Light Load (Related to Fuel Handling) Handling Systems
- One-Time Inspection
- Water Chemistry

Table 3.3.2.1.16, Summary of Aging Management Evaluation – Fuel Storage and Handling Equipment summarizes the results of the aging management review for the Fuel Storage and Handling Equipment.

3.3.2.1.17 Hardened Vent System

Materials

The materials of construction for the Hardened Vent System components are:

- Alloy Steel
- Carbon and low alloy steel
- Elastomer
- Stainless Steel

Environments

The Hardened Vent System components are exposed to the following environments:

- Indoor Air
- Outdoor Air

Aging Effects Requiring Management

The following aging effects associated with the Hardened Vent System components require management:

- Change in Material Properties
- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Hardened Vent System components:

- Bolting Integrity
- One-Time Inspection
- Structures Monitoring Program

Table 3.3.2.1.17, Summary of Aging Management Evaluation – Hardened Vent System summarizes the results of the aging management review for the Hardened Vent System.

3.3.2.1.18 Heating & Process Steam System

Materials

The materials of construction for the Heating & Process Steam System components are:

- Alloy Steel
- Carbon and low alloy steel
- Cast Iron
- Copper
- Copper Alloy
- Elastomers
- Glass
- Polymers
- Stainless Steel

Environments

The Heating & Process Steam System components are exposed to the following environments:

- Auxiliary Steam
- Boiler Treated Water
- Indoor Air
- Outdoor Air
- Soil

Aging Effects Requiring Management

The following aging effects associated with the Heating & Process Steam System components require management:

- Change in Material Properties
- Cracking Initiation and Growth
- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Heating & Process Steam System components:

- Bolting Integrity
- Buried Piping Inspection
- One-Time Inspection
- Periodic Inspection Program
- Selective Leaching of Materials
- Structures Monitoring Program
- Water Chemistry

Table 3.3.2.1.18, Summary of Aging Management Evaluation – Heating & Process Steam System summarizes the results of the aging management review for the Heating & Process Steam System.

3.3.2.1.19 Hydrogen & Oxygen Monitoring System

Materials

The materials of construction for the Hydrogen & Oxygen Monitoring System components are:

- Copper Alloy
- Stainless Steel

Environments

The Hydrogen & Oxygen Monitoring System components are exposed to the following environments:

- Condensation
- Containment Atmosphere
- Dry Gas
- Indoor Air

Aging Effects Requiring Management

The following aging effects associated with the Hydrogen & Oxygen Monitoring System components require management:

- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Hydrogen & Oxygen Monitoring System components:

- Bolting Integrity
- One-Time Inspection

Table 3.3.2.1.19, Summary of Aging Management Evaluation – Hydrogen & Oxygen Monitoring System summarizes the results of the aging management review for the Hydrogen & Oxygen Monitoring System.

3.3.2.1.20 Instrument (Control) Air System

Materials

The materials of construction for the Instrument (Control) Air System components are:

- Aluminum
- Brass
- Bronze
- Carbon and low alloy steel
- Copper
- Stainless Steel
- Zinc

Environments

The Instrument (Control) Air System components are exposed to the following environments:

- Containment Atmosphere
- Dry Gas
- Indoor Air
- Outdoor Air

Aging Effects Requiring Management

The following aging effects associated with the Instrument (Control) Air System components require management:

- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Instrument (Control) Air System components:

- Bolting Integrity
- Compressed Air Monitoring
- Structures Monitoring Program

Table 3.3.2.1.20, Summary of Aging Management Evaluation – Instrument (Control) Air System summarizes the results of the aging management review for the Instrument (Control) Air System.

3.3.2.1.21 Main Fuel Oil Storage & Transfer System

Materials

The materials of construction for the Main Fuel Oil Storage & Transfer System components are:

- Brass
- Carbon and low alloy steel
- Cast Iron
- Stainless Steel

Environments

The Main Fuel Oil Storage & Transfer System components are exposed to the following environments:

- Fuel Oil
- Indoor Air

Aging Effects Requiring Management

The following aging effects associated with the Main Fuel Oil Storage & Transfer System components require management:

- Loss of Material

- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Main Fuel Oil Storage & Transfer System components:

- Bolting Integrity
- Fuel Oil Chemistry
- One-Time Inspection
- Structures Monitoring Program

Table 3.3.2.1.21, Summary of Aging Management Evaluation – Main Fuel Oil Storage & Transfer System summarizes the results of the aging management review for the Main Fuel Oil Storage & Transfer System.

3.3.2.1.22 Miscellaneous Floor and Equipment Drain System

Materials

The materials of construction for the Miscellaneous Floor and Equipment Drain System components are:

- Alloy Steel
- Carbon and low alloy steel
- Cast Iron
- Stainless Steel

Environments

The Miscellaneous Floor and Equipment Drain System components are exposed to the following environments:

- Concrete
- Indoor Air
- Lubricating Oil
- Raw Water – Fresh Water
- Soil

Aging Effects Requiring Management

The following aging effects associated with the Miscellaneous Floor and Equipment Drain System components require management:

- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Miscellaneous Floor and Equipment Drain System components:

- Bolting Integrity
- Buried Piping Inspection
- Lubricating Oil Monitoring Activities

One-Time Inspection

- Selective Leaching of Materials
- Structures Monitoring Program

Table 3.3.2.1.22, Summary of Aging Management Evaluation – Miscellaneous Floor and Equipment Drain System summarizes the results of the aging management review for the Miscellaneous Floor and Equipment Drain System.

3.3.2.1.23 Nitrogen Supply System

Materials

The materials of construction for the Nitrogen Supply System components are:

- Alloy Steel
- Aluminum
- Brass
- Bronze
- Carbon and low alloy steel
- Copper
- Glass
- Stainless Steel

Environments

The Nitrogen Supply System components are exposed to the following environments:

- Condensation
- Dry Gas
- Encased
- Indoor Air
- Outdoor Air

Aging Effects Requiring Management

The following aging effects associated with the Nitrogen Supply System components require management:

- Loss Of Material
- Loss Of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Nitrogen Supply System components:

- Above Ground Outdoor Tanks
- Bolting Integrity
- One-Time Inspection
- Structures Monitoring Program

Table 3.3.2.1.23, Summary of Aging Management Evaluation – Nitrogen Supply System summarizes the results of the aging management review for the Nitrogen Supply System.

3.3.2.1.24 Noble Metals Monitoring System

Materials

The materials of construction for the Noble Metals Monitoring System components are:

- Alloy Steel
- Carbon and low alloy steel
- Stainless Steel

Environments

The Noble Metals Monitoring System components are exposed to the following environments:

- Indoor Air
- Treated Water

Aging Effects Requiring Management

The following aging effects associated with the Noble Metals Monitoring System components require management:

- Cracking Initiation and Growth
- Cumulative Fatigue Damage (TLAA)
- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Noble Metals Monitoring System components:

- Bolting Integrity
- One-Time Inspection
- Water Chemistry

Table 3.3.2.1.24, Summary of Aging Management Evaluation – Noble Metals Monitoring System summarizes the results of the aging management review for the Noble Metals Monitoring System.

3.3.2.1.25 Post-Accident Sampling System

Materials

The materials of construction for the Post-Accident Sampling System components are:

- Alloy Steel
- Carbon and low alloy steel
- Stainless Steel

Environments

The Post-Accident Sampling System components are exposed to the following environments:

- Containment Atmosphere
- Indoor Air
- Treated Water
- Treated Water <140F

Aging Effects Requiring Management

The following aging effects associated with the Post-Accident Sampling System components require management:

- Cracking Initiation and Growth
- Cumulative Fatigue Damage (TLAA)
- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Post-Accident Sampling System components:

- ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD
- Bolting Integrity
- One-Time Inspection
- Structures Monitoring Program
- Water Chemistry

Table 3.3.2.1.25, Summary of Aging Management Evaluation – Post-Accident Sampling System summarizes the results of the aging management review for the Post-Accident Sampling System.

3.3.2.1.26 Process Sampling System

Materials

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

- Alloy Steel
- Carbon and low alloy steel
- Copper
- Elastomer
- Glass
- Stainless Steel

Environments

The Process Sampling System components are exposed to the following environments:

- Closed Cooling Water <140F

- Indoor Air
- Treated Water <140F

Aging Effects Requiring Management

The following aging effects associated with the Process Sampling System components require management:

- Change in Material Properties
- Loss of Material
- Loss of Preload

Aging Management Programs

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

- Bolting Integrity
- Closed Cycle Cooling Water
- One-Time Inspection
- Periodic Inspection
- Structures Monitoring Program
- Water Chemistry

Table 3.3.2.1.26, Summary of Aging Management Evaluation – Process Sampling System summarizes the results of the aging management review for the Process Sampling System.

3.3.2.1.27 Radiation Monitoring System

Materials

The materials of construction for the Radiation Monitoring System components are:

- Alloy Steel
- Carbon and low alloy steel
- Stainless Steel

Environments

The Radiation Monitoring System components are exposed to the following environments:

- Containment Atmosphere
- Indoor Air

Aging Effects Requiring Management

The following aging effects associated with the Radiation Monitoring System components require management:

- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Radiation Monitoring System components:

- Bolting Integrity

Table 3.3.2.1.27, Summary of Aging Management Evaluation – Radiation Monitoring System summarizes the results of the aging management review for the Radiation Monitoring System.

3.3.2.1.28 Radwaste Area Heating and Ventilation System

Materials

The materials of construction for the Radwaste Area Heating and Ventilation System components are:

- Aluminum
- Carbon and low alloy steel
- Elastomer
- Galvanized Steel
- Stainless Steel

Environments

The Radwaste Area Heating and Ventilation System components are exposed to the following environments:

- Indoor Air
- Outdoor Air

Aging Effects Requiring Management

The following aging effects associated with the Radwaste Area Heating and Ventilation System components require management:

- Change in Material Properties
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Radwaste Area Heating and Ventilation System components:

- Periodic Inspection of Ventilation Systems
- Structures Monitoring Program

Table 3.3.2.1.28, Summary of Aging Management Evaluation – Radwaste Area Heating and Ventilation System summarizes the results of the aging management review for the Radwaste Area Heating and Ventilation System.

3.3.2.1.29 Reactor Building Closed Cooling Water System

Materials

The materials of construction for the Reactor Building Closed Cooling Water System components are:

- Alloy Steel
- Aluminum
- Carbon and low alloy steel
- Cast Iron
- Copper
- Copper Alloy
- Glass
- Stainless Steel

Environments

The Reactor Building Closed Cooling Water System components are exposed to the following environments:

- Closed Cooling Water
- Closed Cooling Water < 140F
- Containment Atmosphere
- Indoor Air
- Lubricating Oil
- Soil
- Treated Water
- Treated Water < 140F

Aging Effects Requiring Management

The following aging effects associated with the Reactor Building Closed Cooling Water System components require management:

- Loss of Material
- Loss of Preload
- Reduction of Heat Transfer

Aging Management Programs

The following aging management programs manage the aging effects for the Reactor Building Closed Cooling Water System components:

- Bolting Integrity
- Buried Pipe Inspection
- Closed-Cycle Cooling Water System
- Lubricating Oil Monitoring Activities
- One-Time Inspection
- Selective Leaching of Materials
- Structures Monitoring Program
- Water Chemistry

Table 3.3.2.1.29, Summary of Aging Management Evaluation – Reactor Building Closed Cooling Water System summarizes the results of the aging management review for the Reactor Building Closed Cooling Water System.

3.3.2.1.30 Reactor Building Floor and Equipment Drains

Materials

The materials of construction for the Reactor Building Floor and Equipment Drains components are:
- Alloy Steel
- Carbon and low alloy steel
- Cast Iron
- Stainless Steel

Environments

The Reactor Building Floor and Equipment Drains components are exposed to the following environments:
- Concrete
- Indoor Air
- Raw Water – Fresh Water

Aging Effects Requiring Management

The following aging effects associated with the Reactor Building Floor and Equipment Drains components require management:
- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Reactor Building Floor and Equipment Drains components:
- Bolting Integrity
- One-Time Inspection
- Selective Leaching of Materials
- Structures Monitoring Program

Table 3.3.2.1.30, Summary of Aging Management Evaluation – Reactor Building Floor and Equipment Drains summarizes the results of the aging management review for the Reactor Building Floor and Equipment Drains.

3.3.2.1.31 Reactor Building Ventilation System

Materials

The materials of construction for the Reactor Building Ventilation System components are:
- Aluminum
- Carbon and low alloy steel

- Cast Iron
- Elastomer
- Galvanized Steel
- Stainless Steel

Environments

The Reactor Building Ventilation System components are exposed to the following environments:

- Concrete
- Containment Atmosphere
- Indoor Air
- Outdoor Air

Aging Effects Requiring Management

The following aging effects associated with the Reactor Building Ventilation System components require management:

- Change in Material Properties
- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Reactor Building Ventilation System components:

- 10 CFR Part 50, Appendix J
- Bolting Integrity
- One-Time Inspection
- Periodic Inspection of Ventilation Systems
- Structures Monitoring Program

Table 3.3.2.1.31, Summary of Aging Management Evaluation – Reactor Building Ventilation System summarizes the results of the aging management review for the Reactor Building Ventilation System.

3.3.2.1.32 Reactor Water Cleanup System

Materials

The materials of construction for the Reactor Water Cleanup System components are:

- Alloy Steel
- Carbon and low alloy steel
- Carbon Steel (with elastomer lining)
- CASS
- Cast Iron
- Copper Alloy
- Glass
- Stainless Steel

Environments

The Reactor Water Cleanup System components are exposed to the following environments:

- Containment Atmosphere
- Indoor Air
- Lubricating Oil
- Treated Water
- Treated Water < 140F
- Treated Water > 482F

Aging Effects Requiring Management

The following aging effects associated with the Reactor Water Cleanup System components require management:

- Cracking Initiation and Growth
- Cumulative Fatigue Damage (TLAA)
- Loss of Fracture Toughness
- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Reactor Water Cleanup System components:

- 10 CFR Part 50, Appendix J
- ASME Section XI Inservice Inspection Subsections IWB, IWC, and IWD
- Bolting Integrity
- BWR Reactor Water Cleanup System
- BWR Stress Corrosion Cracking
- Lubricating Oil Monitoring Activities
- One-Time Inspection
- Selective Leaching of Materials
- Structures Monitoring Program
- Water Chemistry

Table 3.3.2.1.32, Summary of Aging Management Evaluation – Reactor Water Cleanup System summarizes the results of the aging management review for the Reactor Water Cleanup System.

3.3.2.1.33 Roof Drains and Overboard Discharge

Materials

The materials of construction for the Roof Drains and Overboard Discharge components are:

- Alloy Steel
- Bronze
- Carbon and low allow steel
- Polymers

Environments

The Roof Drains and Overboard Discharge components are exposed to the following environments:

- Indoor Air
- Raw Water – Fresh Water
- Raw Water – Salt Water
- Soil

Aging Effects Requiring Management

The following aging effects associated with the Roof Drains and Overboard Discharge components require management:

- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Roof Drains and Overboard Discharge components:

- Bolting Integrity
- Buried Piping Inspection
- One-Time Inspection
- Open-Cycle Cooling Water System
- Structures Monitoring Program

Table 3.3.2.1.33, Summary of Aging Management Evaluation – Roof Drains and Overboard Discharge summarizes the results of the aging management review for the Roof Drains and Overboard Discharge.

3.3.2.1.34 Sanitary Waste System

Materials

The materials of construction for the Sanitary Waste System components are:

- Cast Iron
- Polyvinyl Chloride (PVC, CPVC)

Environments

The Sanitary Waste System components are exposed to the following environments:

- Indoor Air
- Raw Water – Fresh Water

Aging Effects Requiring Management

The following aging effects associated with the Sanitary Waste System components require management:

- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Sanitary Waste System components:

- One-Time Inspection
- Selective Leaching of Materials
- Structures Monitoring Program

Table 3.3.2.1.34, Summary of Aging Management Evaluation – Sanitary Waste System summarizes the results of the aging management review for the Sanitary Waste System.

3.3.2.1.35 Service Water System

Materials

The materials of construction for the Service Water System components are:

- Alloy Steel
- Aluminum
- Brass
- Bronze
- Carbon and low alloy steel
- Cast Iron
- Copper Alloy
- Elastomer
- Glass
- Polyvinyl Chloride (PVC, CPVC)
- Stainless Steel
- Titanium

Environments

The Service Water System components are exposed to the following environments:

- Closed Cooling Water
- Indoor Air
- Lubricating Oil
- Outdoor Air
- Raw Water – Salt Water
- Soil

Aging Effects Requiring Management

The following aging effects associated with the Service Water System components require management:

- Change in Material Properties
- Loss of Material
- Loss of Preload
- Reduction of Heat Transfer

Aging Management Programs

The following aging management programs manage the aging effects for the Service Water System components:

- Bolting Integrity
- Buried Piping Inspection
- Closed-Cycle Cooling Water System
- Lubricating Oil Monitoring Activities
- One-Time Inspection
- Open-Cycle Cooling Water System
- Periodic Inspection Program
- Selective Leaching of Materials
- Structures Monitoring Program

Table 3.3.2.1.35, Summary of Aging Management Evaluation – Service Water System summarizes the results of the aging management review for the Service Water System.

3.3.2.1.36 Shutdown Cooling System

Materials

The materials of construction for the Shutdown Cooling System components are:

- Alloy Steel
- Carbon and low alloy steel
- Stainless Steel

Environments

The Shutdown Cooling System components are exposed to the following environments:

- Containment Atmosphere
- Indoor Air
- Treated Water
- Treated Water <140F

Aging Effects Requiring Management

The following aging effects associated with the Shutdown Cooling System components require management:

- Cracking Initiation and Growth
- Cumulative Fatigue Damage (TLAA)
- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Shutdown Cooling System components:

- ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD
- Bolting Integrity
- BWR Stress Corrosion Cracking
- One-Time Inspection
- Structures Monitoring Program
- Water Chemistry

Table 3.3.2.1.36, Summary of Aging Management Evaluation – Shutdown Cooling System summarizes the results of the aging management review for the Shutdown Cooling System.

3.3.2.1.37 Spent Fuel Pool Cooling System

Materials

The materials of construction for the Spent Fuel Pool Cooling System components are:

- Aluminum
- Carbon and low alloy steel
- Cast Iron
- Stainless Steel

Environments

The Spent Fuel Pool Cooling System components are exposed to the following environments:

- Concrete
- Containment Atmosphere
- Indoor Air
- Soil
- Treated Water <140F

Aging Effects Requiring Management

The following aging effects associated with the Spent Fuel Pool Cooling System components require management:

- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Spent Fuel Pool Cooling System components:

- Bolting Integrity
- Buried Piping Inspection
- One-Time Inspection
- Selective Leaching of Materials
- Structures Monitoring Program
- Water Chemistry

Table 3.3.2.1.37, Summary of Aging Management Evaluation – Spent Fuel Pool Cooling System summarizes the results of the aging management review for the Spent Fuel Pool Cooling System.

3.3.2.1.38 Standby Liquid Control System (Liquid Poison System)

Materials

The materials of construction for the Standby Liquid Control System (Liquid Poison System) components are:

- Alloy Steel
- Brass
- Carbon and low alloy steel
- Copper
- Stainless Steel

Environments

The Standby Liquid Control System (Liquid Poison System) components are exposed to the following environments:

- Containment Atmosphere
- Dry Gas
- Indoor Air
- Sodium Pentaborate
- Treated Water
- Treated Water < 140F

Aging Effects Requiring Management

The following aging effects associated with the Standby Liquid Control System (Liquid Poison System) components require management:

- Cracking Initiation and Growth
- Cumulative Fatigue Damage (TLAA)
- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Standby Liquid Control System (Liquid Poison System) components:

- ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD
- Bolting Integrity
- One-Time Inspection
- Structures Monitoring Program
- Water Chemistry

Table 3.3.2.1.38, Summary of Aging Management Evaluation – Standby Liquid Control System (Liquid Poison System) summarizes the results of the aging management review for the Standby Liquid Control System (Liquid Poison System).

3.3.2.1.39 Traveling In-Core Probe System

Materials

The materials of construction for the Traveling In-Core Probe System components are:

- Stainless Steel

Environments

The Traveling In-Core Probe System components are exposed to the following environments:

- Dry Gas
- Indoor Air

Aging Effects Requiring Management

The following aging effects associated with the Traveling In-Core Probe System components require management:

- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Traveling In-Core Probe System components:

- Bolting Integrity

Table 3.3.2.1.39, Summary of Aging Management Evaluation – Traveling In-Core Probe System summarizes the results of the aging management review for the Traveling In-Core Probe System.

3.3.2.1.40 Turbine Building Closed Cooling Water System

Materials

The materials of construction for the Turbine Building Closed Cooling Water System components are:

- Carbon and low alloy steel
- Cast Iron
- Copper
- Copper Alloy
- Galvanized Steel
- Glass
- Stainless Steel

Environments

The Turbine Building Closed Cooling Water System components are exposed to the following environments:

- Closed Cooling Water
- Closed Cooling Water < 140F

Indoor Air

Aging Effects Requiring Management

The following aging effects associated with the Turbine Building Closed Cooling Water System components require management:

- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Turbine Building Closed Cooling Water System components:

- Bolting Integrity
- Closed-Cycle Cooling Water System
- One-Time Inspection
- Selective Leaching of Materials
- Structures Monitoring Program

Table 3.3.2.1.40, Summary of Aging Management Evaluation – Turbine Building Closed Cooling Water System summarizes the results of the aging management review for the Turbine Building Closed Cooling Water System.

3.3.2.1.41 Water Treatment & Distribution System

Materials

The materials of construction for the Water Treatment & Distribution System components are:

- Aluminum
- Brass
- Bronze
- Carbon and low alloy steel
- Cast Iron
- Polymers (plastic)
- Stainless Steel

Environments

The Water Treatment & Distribution System components are exposed to the following environments:

- Containment Atmosphere
- Indoor Air
- Soil
- Treated Water

Aging Effects Requiring Management

The following aging effects associated with the Water Treatment & Distribution System components require management:

Loss of Material

Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Water Treatment & Distribution System components:

- Bolting Integrity
- Buried Piping Inspection
- One-Time Inspection
- Selective Leaching of Materials
- Structures Monitoring Program
- Water Chemistry

Table 3.3.2.1.41, Summary of Aging Management Evaluation – Water Treatment & Distribution System summarizes the results of the aging management review for the Water Treatment & Distribution System.

3.3.2.2 AMR Results Consistent with the GALL Report for Which Further Evaluation is Recommended

NUREG-1801 provides the basis for identifying those programs that warrant further evaluation by the reviewer in the license renewal application. For the Auxiliary Systems, those programs are addressed in the following subsections.

3.3.2.2.1 Cumulative Fatigue Damage (BWR/PWR)

Fatigue is a TLAA as defined in 10 CFR 54.3. TLAAs are required to be evaluated in accordance with 10 CFR 54.21(c). The evaluation of metal fatigue as a TLAA for the non-Class 1 portions of the Reactor Water Cleanup System, Noble Metals Monitoring System, Feedwater System, and Shutdown Cooling System is discussed in Section 4.3.3. The evaluation of Crane load cycles as a TLAA is discussed in Section 4.7.1.

3.3.2.2.2 Cracking due to Cyclic Loading (PWR)

This is applicable to PWRs only.

3.3.2.2.3 Cracking due to Stress Corrosion Cracking (BWR/PWR)

1. Cracking due to SCC could occur in the stainless steel piping, piping components, and piping elements of the BWR Standby Liquid Control System that are in contact with sodium pentaborate solution. The water chemistry program relies on monitoring and control of water chemistry based on the guidelines in TR-103515 to manage the effects of cracking due to SCC. However, high concentrations of impurities at crevices and locations of stagnant flow conditions could cause SCC. Therefore, the GALL report recommends that the effectiveness of the chemistry control program should be verified to ensure that SCC is not occurring. A one-time inspection of select components at susceptible locations is an acceptable method to ensure that stress corrosion cracking is not

occurring and that the component's intended function will be maintained during the period of extended operation.

Oyster Creek will implement a One-Time Inspection program, B.1.24, for susceptible locations to verify the effectiveness of the Water Chemistry program, B.1.2, to manage stress corrosion cracking of stainless steel components exposed to a sodium pentaborate environment in the Standby Liquid Control System (Liquid Poison System). The management of stress corrosion cracking of Standby Liquid Control System (Liquid Poison System) components exposed to sodium pentaborate relies on monitoring and control of Liquid Poison Tank makeup water chemistry. The makeup water is monitored in lieu of the sodium pentaborate solution since the sodium pentaborate would mask most of the chemistry parameters monitored by the Water Chemistry program. The effectiveness of this approach is verified by a one-time inspection of susceptible locations. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Water Chemistry and One-Time Inspection programs are described in Appendix B.

2. Cracking due to SCC could occur in stainless steel and stainless steel clad piping, piping components, and piping elements and heat exchanger tube and shell side components (including tubes) exposed to treated water and closed cycle cooling water greater than 140 degrees Fahrenheit and to diesel exhaust gases. The GALL report recommends further evaluation to ensure that these aging effects are adequately managed.

   For Oyster Creek, Item Number 3.3.1-5 for stainless steel diesel engine exhaust piping, piping components, and piping elements exposed to diesel exhaust is not used. Emergency Diesel Generator components exposed to diesel exhaust gases are carbon steel and are not susceptible to cracking due to stress corrosion cracking. See Item Number 3.3.1-17 and subsection 3.3.2.2.7.3 for the evaluation of steel diesel engine piping, piping components, and piping elements exposed to diesel exhaust.

   At Oyster Creek, stainless steel components in closed cooling water systems are exposed to a closed cycle cooling water environment < 140°F and are not susceptible to cracking due to stress corrosion cracking. The Reactor Water Cleanup (RWCU) System Non-Regenerative Heat Exchanger shell side components are carbon steel and are not susceptible to cracking due to stress corrosion cracking. Reactor Water Cleanup System Regenerative Heat Exchanger stainless steel tube and shell side components and Non-Regenerative Heat Exchanger stainless steel tube side components are exposed to a treated water environment > 140°F and are susceptible to cracking due to stress corrosion cracking. Oyster Creek will implement a One-Time Inspection program, B.1.24, for susceptible locations to verify the effectiveness of the Water Chemistry program, B.1.2, to manage stress corrosion cracking of stainless steel RWCU heat exchanger components exposed to a treated water environment > 140°F. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Water Chemistry and One-Time Inspection programs are described in Appendix B.

3.3.2.2.4 Cracking due to Stress Corrosion Cracking and Cyclic Loading (BWR/PWR)

1. Cracking due to SCC and cyclic loading could occur for high-strength steel closure bolting in auxiliary systems exposed to air with steam or water leakage The GALL report recommends further evaluation to ensure that these aging effects are managed adequately.

   At Oyster Creek the only Auxiliary System that contains high-strength steel closure bolting exposed to air with steam or water leakage is the Control Rod Drive System. The Bolting Integrity program, B.1.12, addresses aging management requirements for this ASME Class 1 high-strength steel closure bolting. Bolting integrity management follows published EPRI guidelines and other industry recommendations for material selection and testing, inservice inspection (ISI), and plant surveillance and maintenance practices. The extent and schedule of the inspections for the Class 1 high-strength steel closure bolting in the Control Rod Drive System is in accordance with ASME Section XI and assures that detection of leakage or fastener degradation will occur prior to loss of system or component intended function. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Bolting Integrity program is described in Appendix B.

2. Cracking Due to SCC and Cyclic Loading in Stainless Steel Heat Exchanger Tube and Shell Side Components (including tubes) in the Chemical and Volume Control System (PWR) Tubes.

   This is applicable to PWRs only.

3. Cracking Due to SCC and Cyclic Loading in Stainless Steel PWR Regenerative Heat Exchanger Tube and Shell Side Components Including Tubes Exposed to Treated Borated Water >60°C (>140°F).

   This is applicable to PWRs only.

3.3.2.2.5 Hardening and Loss of Strength due to Elastomer Degradation (BWR/PWR)

1. Hardening and loss of strength due to elastomer degradation could occur in elastomer seals and components of heating and ventilation systems. The GALL report recommends further evaluation to ensure that these aging effects are adequately managed.

   Oyster Creek will implement a Periodic Inspection of Ventilation Systems program, B.2.4, for the internal and external inspection of elastomer components exposed to an indoor air internal or external environment in the “C” Battery Room Heating and Ventilation System, 480V Switchgear Room Ventilation System, Battery and MG Set Room Ventilation System, Control Room HVAC System, Radwaste Area Heating and Ventilation System, and Reactor Building Ventilation System. Periodic inspections are performed on elastomer door seals and flexible connections to identify detrimental changes in material properties, as evidenced by cracking, perforations in the material, or leakage. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Periodic Inspection of Ventilation Systems program is described in Appendix B.

Oyster Creek will implement a Structures Monitoring Program, B.1.31, for the external inspections of expansion joint and flexible connection elastomers exposed to an indoor air external environment in the Circulating Water System, Heating & Process Steam System, Fire Protection System, Process Sampling System, Condensate System, and Condensate Transfer System. Oyster Creek utilizes the Structures Monitoring Program to inspect the external surfaces of piping, piping components, and piping elements when there are no aging management programs that specifically inspect the component in question. The Structures Monitoring Program relies on periodic visual inspections by qualified individuals to identify and evaluate the degradation of elastomer components to ensure that there is no loss of intended function. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Structures Monitoring Program is described in Appendix B.

2. Hardening loss of strength due to elastomer degradation could occur in elastomer linings of the filters, valves, and ion exchangers in spent fuel pool cooling and cleanup systems (BWR and PWR). The GALL report recommends that a plant-specific aging management program be evaluated that determines and assesses the qualified life of the linings in the environment to ensure that these aging effects are adequately managed.

   Oyster Creek will implement a Periodic Inspection Program, B.2.5, for the internal inspection of expansion joint and flexible connection elastomers exposed to a treated water internal environment in the Condensate System, Condensate Transfer System, Heating & Process Steam System, and Process Sampling System. Oyster Creek utilizes the Periodic Inspection Program to periodically monitor component aging effects when the component is not covered by other existing periodic monitoring programs. The Periodic Inspection Program relies on periodic inspections to identify and evaluate the internal degradation of elastomer components exposed to a treated water internal environment to ensure that there is no loss of intended function. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Periodic Inspection Program is described in Appendix B.

3.3.2.2.6 Loss of Material Due to General Corrosion (BWR/PWR)

Loss of material due to general corrosion could occur for steel piping, bolting, and component external surfaces exposed to air – indoor uncontrolled (external), air – outdoor (external), or condensation (external). The GALL report recommends further evaluation to ensure that these aging effects are adequately managed.

Oyster Creek will implement a Fire Protection program, B.1.19, to inspect the internal and external surfaces of steel piping, piping components, and piping elements exposed to an indoor air internal or external environment, or an outdoor air external environment, for halon/carbon dioxide fire suppression systems. The program provides for periodic system operability testing and visual aging degradation inspections of internal and external surfaces that ensure aging degradation is detected prior to the loss of intended function. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Fire Protection program is described in Appendix B.

Oyster Creek will implement a Fire Water System program, B.1.20, to inspect the external surfaces of steel piping, piping components, and piping elements exposed to an indoor air external or outdoor air external environment for water-based fire protection systems. Program activities include system monitoring, periodic inspections, surveillance testing, and system maintenance activities that ensure aging degradation is detected prior to the loss of intended function. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Fire Water System program is described in Appendix B.

Oyster Creek will implement a Periodic Inspection of Ventilation Systems program, B.2.4, to inspect the internal and external surfaces of steel piping, piping components, piping elements, and ventilation equipment exposed to an indoor air internal or external environment, or an outdoor air external environment in the 480V Switchgear Room Ventilation System, Battery and MG Set Room Ventilation System, Radwaste Area Heating and Ventilation System and Reactor Building Ventilation System. The program will inspect internal and external steel surfaces of ventilation system components to identify and assess aging effects that may be occurring. The program will include surface inspections of steel components for indications of loss of material, such as rust, corrosion, and pitting. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Periodic Inspection of Ventilation Systems program is described in Appendix B.

Oyster Creek will implement a Structures Monitoring Program, B.1.31, to inspect the external surfaces of steel piping, piping components, and piping elements in an indoor air external or outdoor air external environment in the Chlorination System, Circulating Water System, Containment Inerting System, Control Rod Drive System, Drywell Floor and Equipment Drains, Emergency Diesel Generator and Auxiliary System, Emergency Service

Water System, Fire Protection System (Dikes only), Hardened Vent System, Instrument (Control) Air System, Main Fuel Oil Storage & Transfer System, Miscellaneous Floor and Equipment Drain System, Nitrogen Supply System, Primary Containment, Process Sampling System, Reactor Building Closed Cooling Water System, Reactor Building Floor and Equipment Drains, Reactor Building Ventilation System, Reactor Head Cooling System, Reactor Recirculation System, Reactor Water Cleanup System, Roof Drains and Overboard Discharge, Sanitary Waste System, Service Water System, Shutdown Cooling System, Spent Fuel Pool Cooling System, Standby Liquid Control System (Liquid Poison System), Turbine Building Closed Cooling Water System, and Water Treatment & Distribution System. The Structures Monitoring Program relies on periodic visual inspections by qualified individuals to identify and evaluate the degradation of piping, piping components, and piping elements to ensure that there is no loss of intended function. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Structures Monitoring Program is described in Appendix B.

At Oyster Creek, the aging effect of loss of material due to general corrosion in the Primary Containment atmosphere is not considered a credible aging effect for carbon steel components in a containment nitrogen environment because of negligible amounts of free oxygen (less than 4 percent by volume during normal operation). Both oxygen and moisture must be present for general corrosion to occur because oxygen alone or water free of dissolved oxygen (high humidity in a nitrogen atmosphere) does not corrode carbon steel to any practical extent. Therefore, there is no loss of material for carbon steel components exposed to a containment nitrogen environment because, with the negligible amounts of free oxygen, anodic reactions do not take place and the corrosion cell does not form. This conclusion is supported by past precedence (NUREG-1796, Dresden and Quad Cities SER, paragraph 3.1.2.4.1).

3.3.2.2.7 Loss of Material due to General, Pitting, and Crevice Corrosion (BWR/PWR)

1. Loss of material due to general pitting, and crevice corrosion could occur in steel piping, tubing, valves, and tanks in the reactor coolant pump oil collection system of fire protection. The fire protection program relies on a combination of visual and volumetric examinations in accordance with the guidelines of 10 CFR Part 50 Appendix R and Branch Technical Position 9.5-1 to manage loss of material from corrosion. However, corrosion may occur at locations where water from wash downs may accumulate. Therefore, the effectiveness of the program should be verified to ensure that corrosion is not occurring. The GALL report recommends further evaluation of programs to manage loss of material due to general, pitting, and crevice corrosion, to include determining the thickness of the lower portion of the tank. A one-time inspection s an acceptable method to ensure that corrosion is not occurring and that the component's intended function will be maintained during the period of extended operation.

Item Numbers 3.3.1-13 and 3.3.1-14 are not applicable to Oyster Creek. Appendix R (Section III.O) to 10CFR 50 does not apply because the Primary Containment is inert during normal operation.

2. Loss of material due to general, pitting, and crevice corrosion could occur in aluminum and steel piping, piping component, and piping elements exposed to treated water. The water chemistry program relies on monitoring and control of reactor water chemistry based on EPRI guidelines of BWRVIP-29 (TR-103515) for water chemistry in BWRs and TR-105714 for primary water chemistry in PWRs to manage the effects of loss of material from general, pitting or crevice corrosion. However, high concentrations of impurities at crevices and locations of stagnant flow conditions could cause general, pitting, or crevice corrosion. Therefore, the effectiveness of the chemistry control program should be verified to ensure that corrosion is not occurring. The GALL report recommends further evaluation of programs to manage loss of material from general, pitting, and crevice corrosion to verify the effectiveness of the water chemistry program. A one-time inspection of select components at susceptible locations is an acceptable method to ensure that corrosion is not occurring and that the component's intended function will be maintained during the period of extended operation.

   Oyster Creek will implement a One-Time Inspection program, B.1.24, for susceptible locations to verify the effectiveness of the Water Chemistry program, B.1.2, to manage the loss of material in steel and aluminum piping, piping components, and piping elements exposed to a treated water environment in the Control Rod Drive System, Post-Accident Sampling System, Process Sampling System, Reactor Head Cooling System, Reactor Recirculation System, Reactor Water Cleanup System, Shutdown Cooling System, Spent Fuel Pool Cooling System, Standby Liquid Control System (Liquid Poison System), Water Treatment & Distribution System, and, in aluminum Fuel Pool Gates and fuel storage and handling equipment and structures in the Fuel Storage and Handling Equipment System exposed to a treated water environment. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Water Chemistry and One-Time Inspection programs are described in Appendix B.

   When applied to steel ASME Class MC Components in a treated water environment and to steel ASME Class 2 and 3 Piping and Components in a treated water environment, Oyster Creek will use ASME Section XI, Subsection IWF, B.1.28, to verify the effectiveness of the Water Chemistry Program, B.1.2, to mitigate loss of material. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Water Chemistry and ASME Section XI, Subsection IWF programs are described in Appendix B.

3. Loss of material due to general, pitting, and crevice corrosion could occur for steel piping, piping components, piping elements, ducting, closure

bolting, and heat exchanger tubes exposed to air – indoor uncontrolled (internal or external), air -outdoor (external), condensation (internal), moist air, treated water, lubricating oil, or diesel exhaust. The GALL report recommends further evaluation to ensure that these aging effects are adequately managed.

Oyster Creek will implement a One-Time Inspection program, B.1.24, for susceptible locations to verify the effectiveness of the 10 CFR Part 50, Appendix J program, B.1.29, to manage the loss of material in Primary Containment Boundary steel piping, piping components, and piping elements exposed to an indoor air internal environment in the Reactor Water Cleanup System and Reactor Building Ventilation System. The 10 CFR Part 50, Appendix J program provides for the detection of age related degradation due to loss of material. The program consists of tests performed in accordance with the regulations and guidance provided in 10 CFR 50 Appendix J, Option B and station procedures. Containment leak rate tests are performed to assure that leakage through the primary containment and systems and components penetrating primary containment does not exceed allowable leakage limits specified in the Technical Specifications. An integrated leak rate test (ILRT) is performed during a period of reactor shutdown at the frequency specified in 10 CFR Part 50, Appendix J, Option B. Local leak rate tests (LLRT) are performed on isolation valves and containment access penetrations at frequencies that comply with the requirements of 10 CFR 50 Appendix J, Option B. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The 10 CFR Part 50, Appendix J and One-Time Inspection programs are described in Appendix B.

Oyster Creek will implement a Fire Protection program, B.1.19, to inspect the internal surfaces of steel piping, piping components, and piping elements with an indoor air internal environment for halon/carbon dioxide fire suppression systems. The program provides for periodic system operability testing and visual aging degradation inspections of internal surfaces that ensure aging degradation is detected prior to the loss of intended function. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Fire Protection program is described in Appendix B.

Oyster Creek will implement a Fire Water System program, B.1.20, to inspect the internal surfaces of steel piping, piping components, and piping elements with an indoor air internal environment for water-based fire protection systems. Program activities include system monitoring, periodic inspections, surveillance testing, and system maintenance activities that ensure aging degradation is detected prior to the loss of intended function. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Fire Water System program is described in Appendix B.

Oyster Creek will implement a One-Time Inspection program, B.1.24, for susceptible locations to verify the effectiveness of the Lubricating Oil Monitoring Activities program, B.2.2, to manage the loss of material in steel piping, piping components, and piping elements exposed to lubricating oil internal or external environments in the Emergency Diesel Generator and Auxiliary System, Reactor Recirculation System, Reactor Water Cleanup System, Reactor Building Closed Cooling Water System, Control Rod Drive System, Fire Protection System, Miscellaneous Floor and Equipment Drain System, and Service Water System. The Lubricating Oil Monitoring Activities program manages physical and chemical properties of lubricating oil by sampling, testing, and trending to identify specific wear mechanisms, contamination, and oil degradation that could affect intended functions. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Lubricating Oil Monitoring Activities and One-Time Inspection programs are described in Appendix B.

Oyster Creek will implement a One-Time Inspection program, B.1.24, for susceptible locations to verify the effectiveness of Generator Stator Water Chemistry Activities program, B.2.3, to manage the loss of material in steel piping, piping components, piping elements, and heat exchangers exposed to a treated water internal environment in the Main Generator and Auxiliary System. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. Generator Stator Water Chemistry Activities and One-Time Inspection programs are described in Appendix B.

Oyster Creek will implement a Periodic Inspection Program, B.2.5, to manage the loss of material in Emergency Diesel Generator ventilation system steel components exposed to an indoor air internal or external environment or an oil external environment. The Periodic Inspection Program will also be used to manage the loss of material in Emergency Diesel Generator ventilation system ductwork exposed to an indoor air internal environment. The Periodic Inspection Program relies on periodic inspections to identify and evaluate the degradation of steel components exposed to an indoor air internal or external environment or an oil external environment to ensure that there is no loss of intended function. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Periodic Inspection Program is described in Appendix B.

Oyster Creek will implement a Periodic Inspection of Ventilation Systems program, B.2.4, to manage the loss of material in ventilation system steel piping, piping components, and piping elements exposed to an indoor air internal or external environment in the “C” Battery Room Heating and Ventilation System, 480V Switchgear Room Ventilation System, Battery and MG Set Room Ventilation System, Control Room HVAC System, Radwaste Area Heating and Ventilation System, and Reactor Building

Ventilation System. The program will inspect internal and external steel surfaces of ventilation system components to identify and assess aging effects that may be occurring. The program will include surface inspections of steel components for indications of loss of material, such as rust, corrosion, and pitting. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Periodic Inspection of Ventilation Systems program is described in Appendix B.

Oyster Creek will implement a Structures Monitoring Program, B.1.31, to inspect the external surfaces of steel piping, piping components, piping elements, and ductwork exposed to an indoor air external or outdoor air external environment in the Emergency Diesel Generator and Auxiliary System, Chlorination System, and Control Room HVAC System. The Structures Monitoring Program relies on periodic visual inspections by qualified individuals to identify and evaluate the degradation of piping, piping components, and piping elements to ensure that there is no loss of intended function. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Structures Monitoring Program is described in Appendix B.

Oyster Creek will implement a Periodic Inspection Program, B.2.5, to manage the loss of material in steel Emergency Diesel Generator exhaust piping, piping components, and piping elements exposed to a diesel exhaust environment. The Periodic Inspection Program includes periodic condition monitoring examinations to assure that existing environmental conditions are not resulting in material degradation that could result in the loss of system intended functions. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Periodic Inspection Program is described in Appendix B.

At Oyster Creek, the aging effect of loss of material due to general corrosion in the Primary Containment atmosphere is not considered a credible aging effect for carbon steel components in a containment nitrogen environment because of negligible amounts of free oxygen (less than 4 percent by volume during normal operation). Both oxygen and moisture must be present for general corrosion to occur because oxygen alone or water free of dissolved oxygen (high humidity in a nitrogen atmosphere) does not corrode carbon steel to any practical extent. Therefore, there is no loss of material for carbon steel components exposed to a containment nitrogen environment because, with the negligible amounts of free oxygen, anodic reactions do not take place and the corrosion cell does not form. This conclusion is supported by past precedence (NUREG-1796, Dresden and Quad Cities SER, paragraph 3.1.2.4.1).

3.3.2.2.8 Loss of Material due to General, Pitting, Crevice, and Microbiologically Influenced Corrosion (BWR/PWR)

1. Loss of material due to general, pitting, and crevice corrosion and MIC could occur for steel (with or without coating or wrapping) piping, piping components, and piping elements exposed to soil. The buried piping and tanks inspection program relies on industry practice, frequency of pipe excavation, and operating experience to manage the effects of loss of material from general, pitting, and crevice corrosion and MIC. The effectiveness of the buried piping and tanks inspection program should be verified to evaluate an applicant's inspection frequency and operating experience with buried components, ensuring that loss of material is not occurring.

   Oyster Creek will implement a Buried Piping Inspection program, B.1.26, to manage the loss of material in steel piping, piping components, and piping elements exposed to soil in the Service Water System, Emergency Service Water System, Fire Protection System, Drywell Floor and Equipment Drain System, Miscellaneous Floor and Equipment Drain System, Spent Fuel Pool Cooling System, Reactor Building Closed Cooling Water System, and Roof Drains and Overboard Discharge System. The Buried Piping Inspection program includes preventive measures to mitigate corrosion and periodic inspection to manage the effects of corrosion on the pressure-retaining capacity of buried steel piping, piping components, and piping elements. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Buried Piping Inspection program is described in Appendix B.

   Oyster Creek will implement an Aboveground Outdoor Tanks program, B.1.21, to manage the loss of material from the bottom of outdoor steel tanks supported by earthen foundations in the Fire Protection System. The Aboveground Outdoor Tanks program provides for periodic internal UT inspections on the bottom of above ground outdoor steel tanks supported by earthen foundations. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Aboveground Outdoor Tanks program is described in Appendix B.

   Oyster Creek does not have any buried tanks within the scope of License Renewal.

2. Loss of material due to general, pitting, crevice, and microbiologically influenced corrosion (MIC) could occur in the internal surfaces of steel ventilation system exposed to condensation. The GALL report recommends further evaluation to ensure that these aging effects are adequately managed.

   At Oyster Creek, ventilation system components in the scope of license renewal are not subject to internal condensation. A review of the maintenance history of these components has not identified degradation due to the presence of internal condensation. Preventive maintenance activities and system manager walkdowns have not identified or reported internal condensation or resulting internal ventilation system degradation in these components. Therefore, the internal environment for ventilation system components in the scope of license renewal does not include condensation. This applies to the following ventilation systems: “C” Battery Room Heating and Ventilation System, 480V Switchgear Room Ventilation System, 4160V Switchgear Room Ventilation System, Battery and MG Set Room Ventilation System, Control Room HVAC System, Radwaste Area Heating and Ventilation System, and Reactor Building Ventilation System.

Oyster Creek will implement a Periodic Inspection Program, B.2.5, to manage the loss of material in non-ventilation system steel piping, piping components, and piping elements exposed to a condensation internal environment in the Containment Inerting System and the Emergency Diesel Generator and Auxiliary System. The Periodic Inspection Program includes periodic condition monitoring examinations to assure that existing environmental conditions are not resulting in material degradation that could result in the loss of system intended functions. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Periodic Inspection Program is described in Appendix B.

3.3.2.2.9 Loss of Material Due to General, Pitting, Crevice, and Microbiologically Influenced Corrosion and Fouling (BWR/PWR)

1. Loss of material due to general, pitting, and crevice corrosion, MIC, and fouling could occur in the internal surface of steel piping, piping components, piping elements, and tanks exposed to fuel oil. The existing aging management program relies on the fuel oil chemistry program for monitoring and control of fuel oil contamination in accordance with the guidelines of ASTM Standards D4057, D1796, D2709 and D2276 to manage loss of material due to corrosion or fouling. Corrosion or fouling may occur at locations where contaminants accumulate. The effectiveness of the chemistry control program should be verified to ensure that corrosion is not occurring. The GALL report recommends further evaluation of programs to manage corrosion/fouling to verify the effectiveness of the program. A one-time inspection of selected components at susceptible locations is an acceptable method to ensure that corrosion is not occurring and that the component’s intended function will be maintained during the period of extended operation.

   Oyster Creek will implement a One-Time Inspection program, B.1.24, for susceptible locations to verify the effectiveness of the Fuel Oil Chemistry program, B.1.22, to manage the loss of material in steel piping, piping components, and piping elements exposed to a fuel oil internal environment in the Emergency Diesel Generator and Auxiliary System, Main Fuel Oil Storage & Transfer System, and Fire Protection System. The verification of the Fuel Oil Chemistry program to manage the loss of material in steel fuel oil tanks is implemented through the Fuel Oil Chemistry program tank inspection activities which requires that fuel oil tanks be periodically drained, cleaned, and internally inspected to ensure that corrosion is not occurring and that there is no loss of intended function. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Fuel Oil Chemistry and One-Time Inspection programs are described in Appendix B.

2. Loss of material due to general, pitting, crevice corrosion, MIC, and fouling could occur in steel heat exchanger shell side components exposed to lubricating oil. The GALL report recommends further evaluation to ensure that these aging effects are adequately managed.

   Oyster Creek will implement a One-Time Inspection program, B.1.24, for susceptible locations to verify the effectiveness of the Lubricating Oil Monitoring Activities program, B.2.2, to manage the loss of material in steel heat exchanger shell side components exposed to lubricating oil in the Emergency Diesel Generator and Auxiliary System, Reactor Water Cleanup System, and Reactor Recirculation System. The Lubricating Oil Monitoring Activities program manages physical and chemical properties of lubricating oil by sampling, testing, and trending to identify specific wear mechanisms, contamination, and oil degradation that could affect intended functions. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Lubricating Oil Monitoring Activities and One-Time Inspection programs are described in Appendix B.

3.3.2.2.10 Loss of Material Due to Pitting and Crevice Corrosion (BWR/PWR)

1. Loss of material due to pitting and crevice corrosion could occur in the stainless steel, steel with elastomer lining or stainless steel clad piping, piping components, and piping elements exposed to treated water or treated borated water. The water chemistry program relies on monitoring and control of reactor water chemistry based on EPRI guidelines of BWRVIP-29 (TR-103515) for water chemistry in BWRs, TR-105714 for primary water chemistry in PWRs to manage the effects of loss of material from pitting or crevice corrosion. However, high concentrations of impurities at crevices and locations of stagnant flow conditions could cause pitting, or crevice corrosion. Therefore, the effectiveness of the chemistry control program should be verified to ensure that corrosion is not occurring. The GALL report recommends further evaluation of programs to manage loss of material from pitting and crevice corrosion to verify the effectiveness of the water chemistry program. A one-time inspection of select components at susceptible locations is an acceptable method to ensure that corrosion is not occurring and that the component's intended function will be maintained during the period of extended operation.

   Oyster Creek will implement a One-Time Inspection program, B.1.24, for susceptible locations to verify the effectiveness of the Water Chemistry program, B.1.2, to manage the loss of material in stainless steel or elastomer lined steel piping, piping components, piping elements, and heat exchanger tube side components exposed to a treated water environment in the Control Rod Drive System, Post-Accident Sampling System, Process Sampling System, Reactor Building Closed Cooling Water System, Reactor Water Cleanup System, Shutdown Cooling System, Spent Fuel Pool Cooling System, Standby Liquid Control System (Liquid Poison System), Water Treatment & Distribution System, Reactor Head Cooling System, and in the Primary Containment. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Water Chemistry and One-Time Inspection programs are described in Appendix B.

Oyster Creek will implement a One-Time Inspection program, B.1.24, for susceptible locations to verify the effectiveness of the Water Chemistry program, B.1.2, to manage the loss of material in stainless steel fuel storage and handling equipment and structures exposed to a treated water environment in the Fuel Storage and Handling Equipment System, and, to manage the loss of material in the stainless steel fuel pool skimmer surge tank liner exposed to a treated water environment in the Reactor Building Structure. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Water Chemistry and One-Time Inspection programs are described in Appendix B.

When applied to stainless steel ASME Class MC Components in a treated water environment and to stainless steel ASME Class 2 and 3 Piping and Components in a treated water environment, Oyster Creek will use ASME Section XI, Subsection IWF, B.1.28, to verify the effectiveness of the Water Chemistry Program, B.1.2, to mitigate loss of material. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Water Chemistry and ASME Section XI, Subsection IWF programs are described in Appendix B.

2. Loss of material due to pitting and crevice corrosion could occur for stainless steel and copper alloy piping, piping components, piping elements, ducting, and component internal and external surfaces exposed to condensation (internal and external), treated water, waste water (untreated or treated water) and soil. The GALL report recommends further evaluation to ensure that these aging effects are adequately managed.

   Oyster Creek will implement a One-Time Inspection program, B.1.24, for susceptible locations to verify the effectiveness of the Water Chemistry program, B.1.2, to manage the loss of material in stainless steel and copper alloy piping, piping components, and piping elements exposed to a treated water internal or external environment in the Heating & Process Steam System, Reactor Water Cleanup System, Noble Metals Monitoring System, and Control Rod Drive System. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Water Chemistry and One-Time Inspection programs are described in Appendix B.

Oyster Creek will implement a One-Time Inspection program, B.1.24, for susceptible locations to verify the effectiveness of Generator Stator Water Chemistry Activities program, B.2.3, to manage the loss of material in stainless steel piping exposed to a treated water internal environment in the Main Generator and Auxiliary System. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. Generator Stator Water Chemistry Activities and One-Time Inspection programs are described in Appendix B.

Oyster Creek will implement a One-Time Inspection program, B.1.24, to manage the loss of material in stainless steel piping, piping components, and piping elements exposed to a condensation internal environment in the Hydrogen & Oxygen Monitoring System and Nitrogen Supply System. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The One-Time Inspection program is described in Appendix B.

Oyster Creek will implement a Periodic Inspection of Ventilation Systems program, B.2.4, to manage the loss of material in copper heat exchanger coils exposed to an indoor air/condensation external environment in the Control Room HVAC System. The program will inspect the external surfaces of ventilation system components to identify and assess aging effects that may be occurring. The program will include surface inspections of copper alloy components for indications of loss of material. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Periodic Inspection of Ventilation Systems program is described in Appendix B.

Oyster Creek will implement an Aboveground Outdoor Tanks program, B.1.21, to manage the loss of material in outdoor Fire Protection System stainless steel tank components exposed to an outdoor air/condensation external environment. The Aboveground Outdoor Tanks program provides for periodic visual inspection of above ground tanks to detect degradation that could result in the loss of tank intended function. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Aboveground Outdoor Tanks program is described in Appendix B.

3.3.2.2.11 Loss of Material Due to Pitting, Crevice, and Galvanic Corrosion (BWR/PWR)

Pitting, crevice, and galvanic corrosion can occur for copper alloy piping, piping components, and piping elements exposed to lubricating oil. The GALL report recommends further evaluation to ensure that these aging effects are adequately managed.

Oyster Creek will implement a One-Time Inspection program, B.1.24, for susceptible locations to verify the effectiveness of the Lubricating Oil Monitoring Activities program, B.2.2, to manage the loss of material in copper alloy piping, piping components, piping elements, and heat exchangers exposed to a lubricating oil environment in the Service Water System, Reactor Water Cleanup System, Emergency Diesel Generator and Auxiliary System, and Fire Protection System. The Lubricating Oil Monitoring Activities program manages physical and chemical properties of lubricating oil by sampling, testing, and trending to identify specific wear mechanisms, contamination, and oil degradation that could affect intended functions. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Lubricating Oil Monitoring Activities and One-Time Inspection programs are described in Appendix B

3.3.2.2.12 Loss of Material due to Pitting, Crevice, and Microbiologically Influenced Corrosion (BWR/PWR)

1. Loss of material due to pitting, crevice and microbiologically influenced corrosion could occur in aluminum piping, piping components, and piping elements exposed to fuel oil and for copper alloy piping, piping components, and piping elements exposed to fuel oil with water as a contaminant. The existing aging management program relies on the fuel oil chemistry program for monitoring and control of fuel oil contamination in accordance with the guidelines of ASTM Standards D4057, D1796, D2709 and D2276 to manage loss of material due to corrosion. Corrosion may occur at locations where contaminants accumulate. The effectiveness of the chemistry control program should be verified to ensure that corrosion is not occurring. The GALL report recommends further evaluation of programs to manage corrosion to verify the effectiveness of the program. A one-time inspection of selected components at susceptible locations is an acceptable method to ensure that corrosion is not occurring and that the component's intended function will be maintained during the period of extended operation.

   Oyster Creek will implement a One-Time Inspection program, B.1.24, for susceptible locations to verify the effectiveness of the Fuel Oil Chemistry program, B.1.22, to manage the loss of material in aluminum and copper alloy piping, piping components, and piping elements exposed to a fuel oil environment in the Emergency Diesel Generator and Auxiliary System, Main Fuel Oil Storage & Transfer System, and Fire Protection System. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Fuel Oil Chemistry and One-Time Inspection programs are described in Appendix B.

2. Loss of material due to pitting, crevice and microbiologically influenced corrosion could occur in stainless steel piping, piping components, and piping elements exposed to lubricating oil. The GALL report recommends further evaluation to ensure that these aging effects are adequately managed.

Oyster Creek will implement a One-Time Inspection program, B.1.24, for susceptible locations to verify the effectiveness of the Lubricating Oil Monitoring Activities program, B.2.2, to manage the loss of material in stainless steel piping, piping components, and piping elements exposed to a lubricating oil environment in the Emergency Diesel Generator and Auxiliary System. The Lubricating Oil Monitoring Activities program manages physical and chemical properties of lubricating oil by sampling, testing, and trending to identify specific wear mechanisms, contamination, and oil degradation that could affect intended functions. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Lubricating Oil Monitoring Activities and One-Time Inspection programs are described in Appendix B.

3.3.2.2.13 Loss of Material Due to Wear (BWR/PWR)

Loss of material due to wear could occur in the elastomer collars and seals of the ducts in the ventilation systems. The GALL report recommends further evaluation to ensure that these aging effects are adequately managed.

Oyster Creek will implement a Periodic Inspection of Ventilation Systems program, B.2.4, for the inspection of elastomer door seals exposed to an indoor air internal or external environment in the “C” Battery Room Heating and Ventilation System, 480V Switchgear Room Ventilation System, Battery and MG Set Room Ventilation System, Control Room HVAC System, Radwaste Area Heating and Ventilation System, Reactor Building Ventilation System, and Standby Gas Treatment System. Periodic inspections are performed on elastomer door seals to identify detrimental changes in material properties, as evidenced by cracking, perforations in the material, or leakage. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Periodic Inspection of Ventilation Systems program is described in Appendix B.

3.3.2.2.14 Reduction of Neutron-Absorbing Capacity and Loss of Material due to General Corrosion (BWR/PWR)

Reduction of neutron-absorbing capacity and loss of material due to general corrosion could occur in the neutron-absorbing sheets of the spent fuel storage rack in the spent fuel storage. The GALL report recommends further evaluation to ensure that these aging effects are adequately managed.

At Oyster Creek, the aging effects of the Boral Spent Fuel Storage Racks exposed to a treated water environment are insignificant and require no aging management. The potential aging effects resulting from sustained irradiation of Boral were previously evaluated by the staff (BNL-NUREG-25582, dated January 1979; NUREG-1787, VC Summer SER, paragraph 3.5.2.4.2) and determined to be insignificant. Oyster Creek installed four (4) spent fuel storage racks, manufactured by HOLTEC International, that utilized Boral neutron absorbing material, in year 2000. The Boral coupons kept inside the spent fuel storage pool were removed and inspected in 2002, and again in

2004. Inspection results showed no blisters, pits, dimensional changes, or other age related degradations. Neutron transmission tests on the irradiated coupon showed that average Boron-10 areal density in the irradiated coupon is 0.0209 grams/cm2, which means, within the experimental accuracy, Boron-10 has not been lost from the coupons. Plant operating experience is therefore consistent with the staff's previous conclusion and an aging management program is not required.

3.3.2.3 <u>Time-Limited Aging Analysis</u>

The time-limited aging analyses identified below are associated with the Auxiliary Systems components:

- Section 4.3, Metal Fatigue Analysis

3.3.3 CONCLUSION

The Auxiliary Systems piping, fittings, and components that are subject to aging management review have been identified in accordance with the requirements of 10 CFR 54.4. The aging management programs selected to manage aging effects for the Auxiliary Systems components are identified in the summaries in Section 3.3.2.1 above.

A description of these aging management programs is provided in Appendix B, along with the demonstration that the identified aging effects will be managed for the period of extended operation.

Therefore, based on the conclusions provided in Appendix B, the effects of aging associated with the Auxiliary Systems components will be adequately managed so that there is reasonable assurance that the intended function(s) will be maintained consistent with the current licensing basis during the period of extended operation.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-1	Steel cranes - structural girders exposed to air – indoor uncontrolled (external)	Cumulative fatigue damage	TLAA to be evaluated for structural girders of cranes. See the Standard Review Plan, Section 4.7 for generic guidance for meeting the requirements of 10 CFR 54.21(c)(1).	Yes, TLAA	Fatigue is a TLAA; further evaluation is documented in Subsection 3.3.2.2.1.
3.3.1-2	Piping, piping components, piping elements, and heat exchanger shell side components including tubes	Cumulative fatigue damage	TLAA, evaluated in accordance with 10 CFR 54.21(c)	Yes, TLAA	Fatigue is a TLAA; further evaluation is documented in Subsection 3.3.2.2.1.
3.3.1-3	PWR Only				

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems					
Item Number	**Component**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.3.1-4	Stainless steel piping, piping components, and piping elements exposed to sodium pentaborate solution	Cracking due to stress corrosion cracking	Water Chemistry for BWR. The AMP is to be augmented by verifying the effectiveness of water chemistry control. See One-Time Inspection for an acceptable verification program.	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801 with exceptions. The One-Time Inspection program, B.1.24, will be used to verify the effectiveness of the Water Chemistry program, B.1.2, to manage SCC of stainless steel exposed to a sodium pentaborate environment. Exceptions apply to the NUREG-1801 recommendations for Water Chemistry program implementation. See subsection 3.3.2.2.3.1.
3.3.1-5	Stainless steel diesel engine exhaust piping, piping components, and piping elements exposed to diesel exhaust	Cracking due to stress corrosion cracking	Plant specific	Yes, plant specific	Not applicable. See subsection 3.3.2.2.3.2.
3.3.1-6	Stainless steel and stainless clad steel piping, piping components, piping elements, heat exchanger shell and tube side components (including tubes) exposed to treated or closed cycle cooling water >60°C (>140°F)	Cracking due to stress corrosion cracking	Plant specific	Yes, plant specific	The One-Time Inspection program, B.1.24, will be used to verify the effectiveness of the Water Chemistry program, B.1.2, to manage SCC of stainless steel heat exchanger shell and tube side components exposed to a treated water environment >140°F. See subsection 3.3.2.2.3.2.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-7	High-strength steel closure bolting exposed to air with steam or water leakage.	Cracking due to stress corrosion cracking, cyclic loading	Plant specific	Yes, plant specific	The Bolting Integrity program, B.1.12, applies to the Control Rod Drive System ASME Class 1 high-strength steel closure bolting. Bolting integrity management follows published EPRI guidelines and other industry recommendations for material selection and testing, inservice inspection (ISI), and plant surveillance and maintenance practices. See subsection 3.3.2.2.4.1.
3.3.1-8	PWR Only				
3.3.1-9	PWR Only				
3.3.1-10	Elastomer seals and components exposed to air – indoor uncontrolled >35°C (>95°F) (Internal) or air – indoor uncontrolled (External)	Hardening and loss of strength due to elastomer degradation	Plant specific	Yes, plant specific	The Periodic Inspection of Ventilation Systems program, B.2.4, will be used to inspect the internal and external surfaces of elastomer seals and components exposed to an indoor air (internal/external) environment associated with plant ventilation systems. The Structures Monitoring Program, B.1.31, will be used to inspect the external surfaces of elastomer components exposed to an indoor air (external) environment associated with miscellaneous plant Auxiliary Systems. See subsection 3.3.2.2.5.1.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-11	Elastomer lining exposed to treated water or treated borated water	Hardening and loss of strength due to elastomer degradation	A plant-specific aging management program that determines and assesses the qualified life of the linings in the environment is to be evaluated.	Yes, plant specific	The internal inspections of expansion joint and flexible connection elastomers exposed to a treated water internal environment in miscellaneous plant Auxiliary Systems are included in the Periodic Inspection Program, B.2.5. See subsection 3.3.2.2.5.2.
3.3.1-12	Steel piping, bolting, and component external surfaces air – indoor uncontrolled (external), air – outdoor (external), or condensation (external)	Loss of material due to general corrosion	Plant specific	Yes, plant specific	The Fire Protection program, B.1.19, will be used to inspect the internal and external surfaces of steel piping, piping components, and piping elements exposed to an indoor air (internal/external) or outdoor air (external) environment for halon/carbon dioxide fire suppression systems. The Fire Water System program, B.1.20, will be used to inspect the external surfaces of steel piping, piping components, and piping elements exposed to an indoor air (external) or outdoor air (external) environment for water-based fire protection systems. The Periodic Inspection of Ventilation Systems program, B.2.4, will be used to inspect the internal and external surfaces of steel piping, piping components, piping elements, and ventilation equipment exposed to an indoor air (internal/external) or an outdoor air (external) environment for ventilation systems. The Structures Monitoring Program, B.1.31, will be used to inspect the external surfaces of steel piping, piping components, and piping elements

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems					
Item Number	**Component**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
					exposed to an indoor air (external) or outdoor air (external) environment for all other Auxiliary Systems. See subsection 3.3.2.2.6.
3.3.1-13	Steel reactor coolant pump oil collection system piping, tubing, valve bodies, and tank exposed to lubricating oil	Loss of material due to general, pitting and crevice corrosion	A plant specific aging management program that determines the thickness of the lower portion of the tank is to be evaluated. See One-Time Inspection for an acceptable verification program.	Yes, detection of aging effects is to be evaluated	Not applicable. See subsection 3.3.2.2.7.1.
3.3.1-14	Steel reactor coolant pump oil collection system piping, tubing, valve bodies, and tank exposed to lubricating oil	Loss of material due to general, pitting and crevice corrosion	A plant specific aging management program that monitors the degradation of the components is to be evaluated. See One-Time Inspection for an acceptable verification program.	Yes, detection of aging effects is to be evaluated	Not applicable. See subsection 3.3.2.2.7.1.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-15	Steel and aluminum piping, piping components, and piping elements exposed to treated water	Loss of material due to general, pitting and crevice corrosion	Water Chemistry. The AMP is to be augmented by verifying the effectiveness of water chemistry control. See One-Time Inspection for an acceptable verification program.	Yes, detection of aging effects is to be evaluated	The One-Time Inspection program, B.1.24, will be used to verify the effectiveness of the Water Chemistry program, B.1.2, to manage the loss of material in steel and aluminum piping, piping components, and piping elements, in aluminum Fuel Pool Gates, and in aluminum fuel storage and handling equipment and structures, exposed to a treated water environment. When applied to steel ASME Class MC, Class 2, and Class 3 component supports in a treated water environment, ASME Section XI, Subsection IWF, B.1.28, is used to verify the effectiveness of the Water Chemistry Program to mitigate loss of material. See subsection 3.3.2.2.7.2.
3.3.1-16	Steel piping, ducting, closure bolting, and heat exchanger tubes exposed to air – indoor uncontrolled (internal or external), air -outdoor (external), condensation (internal), moist air, treated water, lubricating oil, or diesel exhaust	Loss of material due to general, pitting and crevice corrosion	Plant specific	Yes, detection of aging effects is to be evaluated	The 10 CFR Part 50, Appendix J program, B.1.29, Fire Protection program, B.1.19, Fire Water System program, B.1.20, Generator Stator Water Chemistry Activities program, B.2.3, Lubricating Oil Monitoring Activities program, B.2.2, One-Time Inspection program, B.1.24, Periodic Inspection of Ventilation Systems program, B.2.4, Periodic Inspection Program, B.2.5, and Structures Monitoring Program, B.1.31, will be used to manage the loss of material in steel piping, piping components, piping elements, ducting, and heat exchangers exposed to indoor air (internal/external), outdoor air (external), treated water (internal), and lubricating oil (internal/external) environments. See subsection 3.3.2.2.7.3.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-17	Steel piping, ducting, closure bolting, and heat exchanger tubes exposed to air – indoor uncontrolled (internal or external), air -outdoor (external), condensation (internal), moist air, treated water, lubricating oil, or diesel exhaust	Loss of material/ general (steel only), pitting and crevice corrosion	Plant specific	Yes, detection of aging effects is to be evaluated	The Periodic Inspection Program, B.2.5, will be used to manage the loss of material in steel Emergency Diesel Generator and Auxiliary System exhaust piping, piping components, and piping elements exposed to a diesel exhaust environment. See subsection 3.3.2.2.7.3.
3.3.1-18	Steel (with or without coating or wrapping) piping, piping components, and piping elements exposed to soil	Loss of material due to general, pitting, crevice, and microbiologically influenced corrosion	Buried Piping and Tanks Surveillance or Buried Piping and Tanks Inspection	Yes, detection of aging effects and operating experience are to be further evaluated	The Buried Piping Inspection Program, B.1.26, will be used to manage the loss of material in steel piping, piping components, and piping elements exposed to soil. The Aboveground Outdoor Tanks program, B.1.21, will be used to manage the loss of material from the bottom of outdoor steel tanks supported by earthen foundations. See subsection 3.3.2.2.8.1
3.3.1-19	Steel ducting and components internal surfaces exposed to condensation (internal)	Loss of material due to general, pitting, crevice, and microbiologically influenced corrosion	Plant specific	Yes, plant specific	The Periodic Inspection Program, B.2.5, will be used to manage the loss of material in steel piping, piping components, and piping elements exposed to a condensation (internal) environment. See subsection 3.3.2.2.8.2.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-20	Steel piping, piping components, piping elements, and tanks exposed to fuel oil	Loss of material due to general, pitting, crevice, and microbiologically influenced corrosion, and fouling	Fuel Oil Chemistry. The AMP is to be augmented by verifying the effectiveness of fuel oil chemistry control. See One-Time Inspection for an acceptable verification program.	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801 with exceptions. The One-Time Inspection program, B.1.24, will be used to verify the effectiveness of the Fuel Oil Chemistry program, B.1.22, to manage the loss of material in steel piping, piping components, and piping elements exposed to fuel oil. Fuel Oil Chemistry program tank inspection activities verify the effectiveness of the Fuel Oil Chemistry program to manage the loss of material in steel fuel oil tanks. Exceptions apply to the NUREG-1801 recommendations for Fuel Oil Chemistry program implementation. See subsection 3.3.2.2.9.1.
3.3.1-21	Steel heat exchanger shell side components exposed to lubricating oil	Loss of material due to general, pitting, crevice, and microbiologically influenced corrosion, and fouling	Plant specific	Yes, plant specific	The One-Time Inspection program, B.1.24, will be used to verify the effectiveness of the Lubricating Oil Monitoring Activities program, B.2.2, to manage the loss of material in steel heat exchanger shell side components exposed to lubricating oil. See subsection 3.3.2.2.9.2.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-22	Stainless steel or steel with elastomer lining or stainless steel cladding piping, piping components, and piping elements exposed to treated water or treated borated water	Loss of material due to pitting and crevice corrosion	Water Chemistry. The AMP is to be augmented by verifying the effectiveness of water chemistry control. See One-Time Inspection for an acceptable verification program.	Yes, detection of aging effects is to be evaluated	The One-Time Inspection program, B.1.24, will be used to verify the effectiveness of the Water Chemistry program, B.1.2, to manage the loss of material in stainless steel or elastomer lined steel piping, piping components, piping elements, heat exchanger tube side components, fuel pool skimmer surge tank liner, and Fuel Storage and Handling Equipment exposed to a treated water environment. When applied to stainless steel ASME Class MC, Class 2, and Class 3 component supports in a treated water environment, ASME Section XI, Subsection IWF, B.1.28, is used to verify the effectiveness of the Water Chemistry Program to mitigate loss of material. See subsection 3.3.2.2.10.1.
3.3.1-23	Stainless steel and copper alloy piping, piping components, piping elements, ducting, and component internal and external surfaces exposed to condensation (internal and external), treated water, waste water (untreated or treated water) and soil	Loss of material due to pitting and crevice corrosion	Plant specific	Yes, detection of aging effects is to be evaluated	Oyster Creek will implement a One-Time Inspection program, B.1.24, for susceptible locations to verify the effectiveness of the Water Chemistry program, B.1.2, to manage the loss of material in stainless steel and copper alloy piping, piping components, and piping elements exposed to a treated water (internal/external) environment. Oyster Creek will implement a One-Time Inspection program, B.1.24, for susceptible locations to verify the effectiveness of the Generator Stator Water Chemistry Activities program, B.2.3, to manage the loss of material in stainless steel piping exposed to a treated water (internal) environment in the Main Generator and Auxiliary System. Oyster Creek will implement a One-Time Inspection program, B.1.24, to manage

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
					the loss of material in stainless steel piping, piping components, and piping elements exposed to a condensation (internal) environment. Oyster Creek will implement a Periodic Inspection of Ventilation Systems program, B.2.4, to manage the loss of material in copper heat exchanger coils exposed to an indoor air/condensation (external) environment. Oyster Creek will implement an Aboveground Outdoor Tanks program, B.1.21, to manage the loss of material in outdoor Fire Protection System stainless steel tank components exposed to an outdoor air/condensation (external) environment. See subsection 3.3.2.2.10.2.
3.3.1-24	Copper alloy piping, piping components, and piping elements exposed to lubricating oil	Loss of material due to pitting, crevice, and galvanic corrosion	Plant specific	Yes, plant specific	The One-Time Inspection program, B.1.24, will be used to verify the effectiveness of the Lubricating Oil Monitoring Activities program, B.2.2, to manage the loss of material in copper alloy piping, piping components, piping elements, and heat exchangers exposed to a lubricating oil environment. See subsection 3.3.2.2.11.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-25	Aluminum piping, piping components, and piping elements exposed to fuel oil; Copper alloy piping, piping components, and piping elements exposed to fuel oil (water as a contaminant)	Loss of material due to pitting, crevice, and microbiologically influenced corrosion	Fuel Oil Chemistry. The AMP is to be augmented by verifying the effectiveness of fuel oil chemistry control. See One-Time Inspection for an acceptable verification program.	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801 with exceptions. The One-Time Inspection program, B.1.24, will be used to verify the effectiveness of the Fuel Oil Chemistry program, B.1.22, to manage the loss of material in aluminum piping, piping components, and piping elements exposed to fuel oil. Exceptions apply to the NUREG-1801 recommendations for Fuel Oil Chemistry program implementation. See subsection 3.3.2.2.12.1.
3.3.1-26	Aluminum piping, piping components, and piping elements exposed to fuel oil; Copper alloy piping, piping components, and piping elements exposed to fuel oil (water as a contaminant)	Loss of material due to pitting, crevice, and microbiologically influenced corrosion	Fuel Oil Chemistry. The AMP is to be augmented by verifying the effectiveness of fuel oil chemistry control. See One-Time Inspection for an acceptable verification program.	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801 with exceptions. The One-Time Inspection program, B.1.24, will be used to verify the effectiveness of the Fuel Oil Chemistry program, B.1.22, to manage the loss of material in copper alloy piping, piping components, and piping elements exposed to fuel oil. Exceptions apply to the NUREG-1801 recommendations for Fuel Oil Chemistry program implementation. See subsection 3.3.2.2.12.1.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-27	Stainless steel piping, piping components, and piping elements exposed to lubricating oil	Loss of material due to pitting, crevice, and microbiologically influenced corrosion	Plant specific	Yes, plant specific	The One-Time Inspection program, B.1.24, will be used to verify the effectiveness of the Lubricating Oil Monitoring Activities program, B.2.2, to manage the loss of material in stainless steel piping, piping components, and piping elements exposed to lubricating oil. See subsection 3.3.2.2.12.2.
3.3.1-28	Elastomer seals and components exposed to air – indoor uncontrolled (internal and external)	Loss of material due to wear	Plant specific	Yes, plant specific	The Periodic Inspection of Ventilation Systems program, B.2.4, will be used to inspect elastomer door seals exposed to an indoor air (internal/external) environment associated with plant ventilation systems. See subsection 3.3.2.2.13.
3.3.1-29	Boral, boron steel spent fuel storage racks neutron-absorbing sheets exposed to treated water or treated borated water	Reduction of neutron-absorbing capacity and loss of material due to general corrosion	Plant specific	Yes, plant specific	The aging effects of Boral exposed to a treated water environment are insignificant and require no aging management. See subsection 3.3.2.2.14.
3.3.1-30	Boraflex spent fuel storage racks neutron-absorbing sheets exposed to treated water or treated borated water	Reduction of neutron-absorbing capacity due to boraflex degradation	Boraflex Monitoring	No	Consistent with NUREG-1801 with exceptions. The Boraflex Rack Management Program, B.1.15, will be used to manage the aging effects of boraflex spent fuel storage racks exposed to a treated water environment. Exceptions apply to the NUREG-1801 recommendations for Boraflex Rack Management Program implementation.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-31	Stainless steel and cast austenitic stainless steel piping, piping components, and piping elements exposed to treated water >60°C (>140°F)	Cracking due to Stress corrosion cracking, intergranular stress corrosion cracking	BWR Reactor Water Cleanup System	No	The BWR Reactor Water Cleanup System program, B.1.18, will be used to manage stress corrosion cracking in stainless steel Reactor Water Cleanup System piping exposed to treated water > 140°F for piping 4” nominal pipe size. The One-Time Inspection program, B.1.24, will be used to verify the effectiveness of the Water Chemistry program, B.1.2, to manage stress corrosion cracking in stainless steel Reactor Water Cleanup System and Noble Metals Monitoring System piping exposed to treated water > 140°F for piping < 4” nominal pipe size.
3.3.1-32	Stainless steel and cast austenitic stainless steel piping, piping components, and piping elements exposed to treated water >60°C (>140°F)	Cracking due to stress corrosion cracking	BWR Stress Corrosion Cracking and Water Chemistry for BWR	No	Not applicable. Oyster Creek has no stainless steel Non-RCPB Shutdown Cooling System piping exposed to treated water > 140°F. The RCPB portion of the Shutdown Cooling System is discussed in Section 3.1.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-33	Steel tanks in diesel fuel oil system exposed to air - outdoor (external)	Loss of material due to general, pitting and crevice corrosion	Aboveground steel tanks	No	Consistent with NUREG-1801 with exceptions. The Aboveground Outdoor Tanks program, B.1.21, will be used to manage the loss of material in aboveground steel tanks exposed to an outdoor air (external) environment in the Fire Protection System, Emergency Diesel Generator and Auxiliary System, and Nitrogen Supply System. Exceptions apply to the NUREG-1801 recommendations for Aboveground Outdoor Tanks program implementation.
3.3.1-34	High-strength steel closure bolting exposed to air with steam or water leakage	Cracking due to cyclic loading, stress corrosion cracking	Bolting Integrity	No	Not applicable. Auxiliary System high-strength steel closure bolting exposed to air with steam or water leakage applies only to the Control Rod Drive System. Control Rod Drive System high-strength steel closure bolting is evaluated in Item Number 3.3.1-7.
3.3.1-35	Steel closure bolting exposed to air – indoor uncontrolled (external)	Loss of material due to general, pitting and crevice corrosion, loss of preload due to stress relaxation	Bolting Integrity	No	Except as discussed below, the Bolting Integrity program, B.1.12, will be used to manage the loss of material and loss of preload in steel closure bolting exposed to an indoor air/containment atmosphere (external) environment in Auxiliary Systems. The ASME Section XI, Subsection IWE program, B.1.27, will be used to manage the loss of material and loss of preload in steel closure bolting exposed to an indoor air (external) environment in the Containment Vacuum

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems					
Item Number	**Component**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
					Breakers System. The Structures Monitoring program, B.1.31, will be used to manage the loss of material and loss of preload in steel structural bolting exposed to an indoor air/containment atmosphere (external) environment in Buildings/Structures, and, will be used to manage the loss of material in steel closure bolting exposed to an indoor air (external) environment in ventilation systems. The Inspection of Overhead Heavy Load and Light Load (Related to Fuel handling) Handling Systems program, B.1.16, will be used to manage the loss of material and loss of preload in steel structural bolting exposed to an indoor air (external) environment in the Fuel Storage and Handling Equipment System and Cranes and Hoists System.
3.3.1-36	Steel bolting exposed to air – outdoor (external)	Loss of material due to general, pitting and crevice corrosion	Bolting Integrity	No	Except as discussed below, the Bolting Integrity program, B.1.12, will be used to manage the loss of material in steel closure bolting exposed to an outdoor air (external) environment in Auxiliary Systems. The Inspection of Overhead Heavy Load and Light Load (Related to Fuel handling) Handling Systems program, B.1.16, will be used to manage the loss of material in steel structural bolting exposed to an outdoor air (external) environment in the Cranes and Hoists System.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
					The Structures Monitoring program, B.1.31, will be used to manage the loss of material in steel structural bolting exposed to an outdoor air (external) environment in Buildings and Structures, and, in steel closure bolting exposed to an outdoor air (external) environment in ventilation systems.
3.3.1-37	Steel closure bolting exposed to air with steam or water leakage	Loss of material due to general corrosion	Bolting Integrity	No	Not applicable. Except for Control Rod Drive System high-strength steel closure bolting which is evaluated in Item Number 3.3.1-7, Auxiliary System steel closure bolting is not exposed to air with steam or water leakage.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-38	Copper alloy piping, piping components, piping elements, and heat exchanger tubes exposed to treated and closed cycle cooling water	Loss of material due to pitting, crevice, and galvanic corrosion	Closed-Cycle Cooling Water System	No	The Closed Cycle Cooling Water Program, B.1.14, will be used to manage the loss of material in copper alloy piping, piping components, piping elements, and heat exchangers exposed to a closed cycle cooling water environment in the Emergency Diesel Generator and Auxiliary System, Process Sampling System, Reactor Building Closed Cooling Water System, and Turbine Building Closed Cooling Water System. The One-Time Inspection program, B.1.24, will be used to verify the effectiveness of the Water Chemistry program, B.1.2, to manage the loss of material in copper alloy piping, piping components, and piping elements exposed to a treated water environment in the Reactor Building Closed Cooling Water System and Condensate Transfer System.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-39	Stainless steel piping, piping components, and piping elements exposed to closed cycle cooling water	Loss of material due to pitting and crevice corrosion	Closed-Cycle Cooling Water System	No	The Closed Cycle Cooling Water program, B.1.14, will be used to manage the loss of material in stainless steel piping, piping components, and piping elements exposed to a closed cycle cooling water environment in the Emergency Diesel Generator and Auxiliary System, Process Sampling System, Reactor Building Closed Cooling Water System, and Turbine Building Closed Cooling Water System. The One-Time Inspection program, B.1.24, will be used to verify the effectiveness of the Closed Cycle Cooling Water Program to manage the loss of material in stagnant flow areas.
3.3.1-40	Stainless steel heat exchanger tubes exposed to closed cycle cooling water	Reduction of heat transfer due to fouling	Closed-Cycle Cooling Water System	No	Consistent with NUREG-1801 with exceptions. The Closed Cycle Cooling Water program, B.1.14, will be used to manage the reduction of heat transfer in stainless steel heat exchanger tubes and plates exposed to a closed cycle cooling water environment in the Reactor Building Closed Cooling Water System. Exceptions apply to the NUREG-1801 recommendations for Closed-Cycle Cooling Water System program implementation.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-41	Stainless steel; steel with stainless steel cladding heat exchanger shell side components including tubes exposed to closed cycle cooling water	Loss of material due to microbiologically influenced corrosion	Closed-Cycle Cooling Water System	No	Consistent with NUREG-1801 with exceptions. The Closed Cycle Cooling Water program, B.1.14, will be used to manage the loss of material in stainless steel heat exchanger/cooler shell side components, tubes, plates, and nozzles exposed to a closed cycle cooling water environment in the Reactor Building Closed Cooling Water System and Turbine Building Closed Cooling Water System. Exceptions apply to the NUREG-1801 recommendations for Closed-Cycle Cooling Water System program implementation.
3.3.1-42	Steel piping, piping components, piping elements, tanks, and heat exchanger shell side components exposed to closed cycle cooling water	Loss of material due to general, pitting and crevice corrosion	Closed-Cycle Cooling Water System	No	The Closed Cycle Cooling Water program, B.1.14, will be used to manage the loss of material in steel piping, piping components, piping elements, tanks, and heat exchanger/cooler shell side components, tubes, covers, and nozzles exposed to a closed cycle cooling water environment in the Emergency Diesel Generator and Auxiliary System, Process Sampling System, Reactor Building Closed Cooling Water System, Service Water System, and Turbine Building Closed Cooling Water System. The One-Time Inspection program, B.1.24, will be used to verify the effectiveness of the Closed Cycle Cooling Water Program to manage the loss of material in stagnant flow areas.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-43	Gray cast iron piping, piping components, and piping elements exposed to closed cycle cooling water	Loss of material due to pitting and crevice corrosion, and selective leaching	Closed-Cycle Cooling Water System and Selective Leaching of Materials	No	The Closed Cycle Cooling Water program, B.1.14, and the Selective Leaching of Materials program, B.1.25, will be used to manage the loss of material in cast iron piping, piping components, piping elements, and cooler tube side components exposed to a closed cycle cooling water environment in the Reactor Building Closed Cooling Water System and Turbine Building Closed Cooling Water System. The One-Time Inspection program, B.1.24, will be used to verify the effectiveness of the Closed Cycle Cooling Water program and Selective Leaching of Materials program to manage the loss of material in stagnant flow areas.
3.3.1-44	Steel compressed air system closure bolting exposed to condensation	Loss of material due to general, pitting and crevice corrosion	Compressed Air Monitoring	No	Not applicable. Instrument (Control) Air System steel closure bolting is not exposed to condensation. Instrument (Control) Air System steel closure bolting exposed to an indoor air (external) environment is discussed in Item Number 3.3.1-35.
3.3.1-45	Steel compressed air system piping, piping components, and piping elements exposed to condensation (internal)	Loss of material due to general and pitting corrosion	Compressed Air Monitoring	No	Not applicable. Instrument (Control) Air System piping, piping components, and piping elements are not exposed to a condensation (internal) environment. Instrument (Control) Air System piping, piping components, and piping elements exposed to a dry gas (internal) environment are discussed in Item Number 3.3.1-79 and 3.3.1-80.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-46	Elastomer fire barrier penetration seals exposed to air – outdoor or indoor uncontrolled	Increased elastomer hardness, shrinkage and loss of strength due to weathering	Fire Protection	No	The Fire Protection program, B.1.19, will be used to manage the change in material properties of elastomer fire barriers exposed to an indoor air environment in the Fire Protection System. The Structures Monitoring program, B.1.31, will be used to manage the change in material properties of elastomer expansion joints and enclosure boots exposed to an indoor or outdoor air environment in the Service Water System, Emergency Service Water System, and Hardened Vent System, and, in elastomer seals and penetration seals exposed to an indoor or outdoor air environment in Buildings and Structures.
3.3.1-47	Steel fire rated doors exposed to air – outdoor or indoor uncontrolled	Loss of material due to wear	Fire Protection	No	Consistent with NUREG-1801 with exceptions. The Fire Protection program, B.1.19, will be used to manage the loss of material in steel fire doors exposed to an indoor or outdoor air environment. Exceptions apply to the NUREG-1801 recommendations for Fire Protection program implementation.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-48	Steel piping, piping components, and piping elements exposed to fuel oil	Loss of material due to general, pitting and crevice corrosion	Fire Protection and Fuel Oil Chemistry	No	Consistent with NUREG-1801 with exceptions. The Fire Protection program, B.1.19, and the Fuel Oil Chemistry program, B.1.22, will be used to manage the loss of material in steel piping, piping components, and piping elements exposed to a fuel oil environment in the Fire Protection System. Exceptions apply to the NUREG-1801 recommendations for Fire Protection program and Fuel Oil Chemistry program implementation.
3.3.1-49	Reinforced concrete structural fire barriers – walls, ceilings and floors exposed to air – outdoor or indoor uncontrolled	Concrete cracking and spalling due to freeze thaw, aggressive chemical attack, and reaction with aggregates	Fire Protection and Structures Monitoring Program	No	Consistent with NUREG-1801 with exceptions. The Fire Protection program, B.1.19, and the Structures Monitoring Program, B.1.31, will be used to manage cracking in concrete fire barrier walls and slabs exposed to an indoor or outdoor air environment. Exceptions apply to the NUREG-1801 recommendations for Fire Protection program implementation.
3.3.1-50	Reinforced concrete structural fire barriers – walls, ceilings and floors exposed to air – outdoor or indoor uncontrolled	Loss of material due to corrosion of embedded steel	Fire Protection and Structures Monitoring Program	No	Consistent with NUREG-1801 with exceptions. The Fire Protection program, B.1.19, and the Structures Monitoring Program, B.1.31, will be used to manage loss of material in concrete fire barrier walls and slabs exposed to an indoor or outdoor air environment. Exceptions apply to the NUREG-1801 recommendations for Fire Protection program implementation.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-51	Copper alloy piping, piping components, and piping elements exposed to raw water	Loss of material due to pitting, crevice, and microbiologically influenced corrosion, and fouling	Fire Water System	No	Consistent with NUREG-1801. The Fire Water System program, B.1.20, will be used to manage the loss of material in copper alloy piping, piping components, and piping elements exposed to a raw water environment in the Fire Protection System.
3.3.1-52	Stainless steel piping, piping components, and piping elements exposed to raw water	Loss of material due to pitting and crevice corrosion, and fouling	Fire Water System	No	Consistent with NUREG-1801. The Fire Water System program, B.1.20, will be used to manage the loss of material in stainless steel piping, piping components, and piping elements exposed to a raw water environment in the Fire Protection System.
3.3.1-53	Steel piping, piping components, and piping elements exposed to raw water	Loss of material due to general, pitting, crevice, and microbiologically influenced corrosion, and fouling	Fire Water System	No	Consistent with NUREG-1801. The Fire Water System program, B.1.20, will be used to manage the loss of material in steel piping, piping components, and piping elements exposed to a raw water environment in the Fire Protection System.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-54	Stainless steel piping, piping components, and piping elements exposed to fuel oil	Loss of material due to pitting, crevice, and microbiologically influenced corrosion	Fuel Oil Chemistry	No	Consistent with NUREG-1801 with exceptions. The Fuel Oil Chemistry program, B.1.22, will be used to manage the loss of material in stainless steel piping, piping components, and piping elements exposed to a fuel oil environment in the Emergency Diesel Generator and Auxiliary System and Main Fuel Oil Storage & Transfer System. Exceptions apply to the NUREG-1801 recommendations for Fuel Oil Chemistry program implementation.
3.3.1-55	Steel crane structural girders in load handling system exposed to air-indoor uncontrolled (external)	Loss of material due to general corrosion	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems	No	Consistent with NUREG-1801 with exceptions. The Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems program, B.1.16, will be used to manage the loss of material in steel rail systems, jib cranes, monorails and hoists, and cranes structural components exposed to an indoor air (external) environment in the Cranes and Hoists System. Exceptions apply to the NUREG-1801 recommendations for Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems program implementation.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-56	Steel cranes - rails exposed to air – indoor uncontrolled (external)	Loss of material due to wear	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems	No	Consistent with NUREG-1801 with exceptions. The Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems program, B.1.16, will be used to manage the loss of material in steel crane rail systems exposed to an indoor air (external) environment in the Cranes and Hoists System. Exceptions apply to the NUREG-1801 recommendations for Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems program implementation.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-57	Copper alloy piping, piping components, piping elements, and heat exchanger components (including tubes) exposed to raw water	Loss of material due to pitting, crevice, and microbiologically influenced corrosion, and fouling	Open-Cycle Cooling Water System	No	The Open Cycle Cooling Water program, B.1.13, will be used to manage the loss of material in copper alloy piping, piping components, piping elements and heat exchanger tube side components exposed to a raw water – salt water environment in the Emergency Service Water System, Roof Drains and Overboard Discharge System, and Service Water System. The Periodic Inspection Program, B.2.5, will be used to manage the loss of material in copper alloy piping, piping components, and piping elements exposed to a raw water – salt water environment in the Circulating Water System. The Fire Water System program, B.1.20, will be used to manage the loss of material in copper alloy heat exchanger shell and tube side components exposed to a raw water – fresh water environment in the Fire Protection System.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-58	Stainless steel piping, piping components, and piping elements exposed to raw water	Loss of material due to pitting and crevice corrosion, and fouling	Open-Cycle Cooling Water System	No	The Open Cycle Cooling Water program, B.1.13, will be used to manage the loss of material in stainless steel piping, piping components, and piping elements exposed to a raw water – salt water environment in the Emergency Service Water System and Service Water System. The Periodic Inspection Program, B.2.5, will be used to manage the loss of material in stainless steel piping, piping components, and piping elements exposed to a raw water – salt water environment in the Circulating Water System.
3.3.1-59	Stainless steel and copper alloy piping, piping components, and piping elements exposed to raw water	Loss of material due to pitting, crevice, and microbiologically influenced corrosion	Open-Cycle Cooling Water System	No	Not applicable. There are no in-scope steel or copper alloy piping, piping components, and piping elements exposed to raw water in the Oyster Creek Emergency Diesel Generator and Auxiliary system. The diesels are cooled by radiators in a closed cooling water system.
3.3.1-60	Stainless steel and copper alloy heat exchanger tubes exposed to raw water	Reduction of heat transfer due to fouling	Open-Cycle Cooling Water System	No	The Fire Water System program, B.1.20, will be used to manage the reduction of heat transfer in copper alloy heat exchanger tubes exposed to a raw water – fresh water environment in the Fire Protection System.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems					
Item Number	**Component**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.3.1-61	Stainless steel, nickel alloy, and copper alloy piping, piping components, and piping elements exposed to raw water	Loss of material due to pitting and crevice corrosion	Open-Cycle Cooling Water System	No	The Open Cycle Cooling Water program, B.1.13, will be used to manage the loss of material in nickel alloy piping components and piping elements exposed to a raw water – salt water environment in the Emergency Service Water System. The One-Time Inspection program, B.1.24, will be used to manage the loss of material in stainless steel piping exposed to a raw water – fresh water environment in the Reactor Building Floor and Equipment Drains System.
3.3.1-62	Steel piping, piping components, and piping elements exposed to raw water	Loss of material due to general, pitting, crevice, and microbiologically influenced corrosion	Open-Cycle Cooling Water System	No	The Structures Monitoring Program, B.1.31, will be used to manage the loss of material in galvanized steel trash racks exposed to a standing water environment in the Intake Structure and Canal Structure. The One-Time Inspection program, B.1.24, will be used to manage the loss of material in cast iron piping exposed to a raw water – fresh water environment in the Sanitary Waste System.
3.3.1-63	Steel piping, piping components, and piping elements (without lining/coating or with degraded lining/coating) and heat exchanger tube side components	Loss of material due to general, pitting, crevice, and microbiologically influenced corrosion, and fouling	Open-Cycle Cooling Water System	No	The Open Cycle Cooling Water program, B.1.13, will be used to manage the loss of material in steel piping, piping components, piping elements, and heat exchanger tube side components exposed to a raw water – salt water environment in the Chlorination System, Roof Drains and Overboard Discharge System, Service Water

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
	(including tubes) exposed to raw water				System, and Emergency Service Water System. The Periodic Inspection Program, B.2.5, will be used to manage the loss of material in steel piping, piping components, and piping elements exposed to a raw water – salt water environment in the Circulating Water System. The One-Time Inspection program, B.1.24, will be used to manage the loss of material in steel piping, piping components, and piping elements exposed to a raw water – fresh water environment in the Reactor Building Floor and Equipment Drains System and in the Miscellaneous Floor and Equipment Drain System.
3.3.1-64	Steel piping, piping components, and piping elements with internal lining or coating exposed to raw water	Loss of material due to lining or coating degradation	Open-Cycle Cooling Water System	No	Not applicable. The presence of internal linings for corrosion protection is conservatively not credited. Degradation of internal coatings can contribute to potential downstream flow blockage. However NUREG-1801 Table IX.F under the aging mechanism of “fouling” states that reduction of system flow rate is considered active and thus not in the purview of license renewal. Therefore credit is not being taken for internal coating inspections.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-65	Copper alloy >15% Zn piping, piping components, piping elements, and heat exchanger tube side components (including tubes) exposed to 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 of Materials program, B.1.25, will be used to manage the loss of material in copper alloy >15% Zn piping, piping components, piping elements, and heat exchanger/cooler tube side components exposed to a closed cycle cooling water, raw water – salt water, raw water – fresh water, and treated water environment in the Circulating Water System, Condensate Transfer System, Control Rod Drive System, Emergency Diesel Generator and Auxiliary System, Emergency Service Water System, Fire Protection System, Heating & Process Steam System, Reactor Building Closed Cooling Water System, Reactor Water Cleanup System, Service Water System, Turbine Building Closed Cooling Water System, and Water Treatment & Distribution System.
3.3.1-66	Gray cast iron piping, piping components, and piping elements exposed to soil, raw water, treated water, or untreated water	Loss of material due to selective leaching and general corrosion	Selective Leaching of Materials	No	Consistent with NUREG-1801. The Selective Leaching of Materials program, B.1.25, will be used to manage the loss of material in cast iron piping components and piping elements exposed to a soil environment in the Fire Protection System.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-67	Gray cast iron piping, piping components, and piping elements exposed to soil, raw water, treated water, or untreated water	Loss of material due to selective leaching	Selective Leaching of Materials	No	Consistent with NUREG-1801. The Selective Leaching of Materials program, B.1.25, will be used to manage the loss of material in cast iron piping, piping components, and piping elements exposed to condensation, raw water – fresh water, raw water – salt water, and treated water environment in the Chlorination System, Circulating Water System, Containment Inerting System, Drywell Floor and Equipment Drains System, Fire Protection System, Miscellaneous Floor and Equipment Drain System, Reactor Building Floor and Equipment Drains System, Reactor Water Cleanup System, Sanitary Waste System, Service Water System, Spent Fuel Pool Cooling System, and Water Treatment & Distribution System.
3.3.1-68	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	The Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems, B.1.16, will be used to manage the loss of material in the steel Refueling Platform exposed to an indoor air (external) environment in the Fuel Storage and Handling Equipment System.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-69	Stainless steel heat exchanger tubes exposed to treated water	Reduction of heat transfer due to fouling	Water Chemistry	No	Consistent with NUREG-1801 with exceptions. The Water Chemistry program, B.1.2, will be used to manage the reduction of heat transfer in stainless steel heat exchanger tubes and plates exposed to a treated water environment in the Reactor Building Closed Cooling Water System. Exceptions apply to the NUREG-1801 recommendations for Water Chemistry program implementation.
3.3.1-70	Stainless steel spent fuel storage racks exposed to treated water or treated borated water, >60°C (>140°F)	Cracking due to stress corrosion cracking	Water Chemistry	No	Not applicable. Stainless steel spent fuel storage racks are exposed to a treated water <140°F environment and are not susceptible to cracking. The loss of material aging effect for spent fuel storage racks exposed to a treated water <140°F environment is evaluated in Item Number 3.3.1-22.
3.3.1-71	PWR Only				
3.3.1-72	PWR Only				
3.3.1-73	PWR Only				

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-74	Galvanized steel piping, piping components, and piping elements exposed to air – indoor uncontrolled	None	None	NA - No AEM or AMP	Consistent with NUREG-1801.
3.3.1-75	Glass piping, piping components, and piping elements exposed to air, fuel oil, lubricating oil, raw water, treated water, and treated borated water	None	None	NA - No AEM or AMP	Consistent with NUREG-1801.
3.3.1-76	Stainless steel, cast austenitic 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.
3.3.1-77	Steel and aluminum piping, piping components, and piping elements exposed to air – indoor controlled (external)	None	None	NA - No AEM or AMP	Not applicable. Indoor air controlled (external) environment is not used.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-78	Steel and stainless steel piping, piping components, and piping elements in concrete	None	None	NA - No AEM or AMP	Consistent with NUREG-1801.
3.3.1-79	Steel, stainless steel, aluminum, and copper alloy piping, piping components, and piping elements exposed to gas	None	None	NA - No AEM or AMP	Consistent with NUREG-1801.
3.3.1-80	Steel, stainless steel, and copper alloy piping, piping components, and piping elements exposed to lubricating oil (no water pooling) or dried air	None	None	NA - No AEM or AMP	Steel, stainless steel, and copper alloy piping, piping components, and piping elements are exposed to a dry gas (internal) environment in the Instrument (Control) Air System. The Compressed Air Monitoring program, B.1.17, ensures that compressed air is sufficiently dry to preclude internal condensation in the Instrument (Control) Air System.
3.3.1-81	PWR Only				

Table 3.3.2.1.1
"C" Battery Room Heating & Ventilation
Summary of Aging Management Evaluation

Table 3.3.2.1.1 "C" Battery Room Heating & Ventilation

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bird Screen	Filter	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	C
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-4 (AP-27)	3.3.1-35	E, 1
		Stainless Steel	Indoor Air (External)	None	None			G, 3
Damper housing	Pressure Boundary	Galvanized Steel	Indoor Air (External)	None	None	VII.J-8 (AP-13)	3.3.1-74	C
			Indoor Air (Internal)	None	None	VII.J-8 (AP-13)	3.3.1-74	C, 2
Door Seal	Pressure Boundary	Elastomer	Indoor Air (External)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F2-7 (A-36)	3.3.1-10	E
				Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F2-8 (A-73)	3.3.1-28	E

Table 3.3.2.1.1 "C" Battery Room Heating & Ventilation (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Door Seal	Pressure Boundary	Elastomer	Indoor Air (Internal)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F2-10 (A-17)	3.3.1-10	E
				Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F2-9 (A-18)	3.3.1-28	E
Ductwork	Pressure Boundary	Galvanized Steel	Indoor Air (External)	None	None	VII.J-8 (AP-13)	3.3.1-74	C
			Indoor Air (Internal)	None	None	VII.J-8 (AP-13)	3.3.1-74	C, 2
Fan Housing	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F2-1 (A-10)	3.3.1-16	E
			Indoor Air (Internal)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F2-2 (A-08)	3.3.1-16	E
Filter Housing	Pressure Boundary	Galvanized Steel	Indoor Air (External)	None	None	VII.J-8 (AP-13)	3.3.1-74	C
			Indoor Air (Internal)	None	None	VII.J-8 (AP-13)	3.3.1-74	C, 2
Flexible Connection	Pressure Boundary	Elastomer	Indoor Air (External)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F2-7 (A-36)	3.3.1-10	E
			Indoor Air (Internal)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F2-10 (A-17)	3.3.1-10	E

Table 3.3.2.1.1 "C" Battery Room Heating & Ventilation (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flow Element	Pressure Boundary	Galvanized Steel	Indoor Air (External)	None	None	VII.J-8 (AP-13)	3.3.1-74	C
			Indoor Air (Internal)	None	None	VII.J-8 (AP-13)	3.3.1-74	C, 2
Louvers	Pressure Boundary	Galvanized Steel	Indoor Air (External)	None	None	VII.J-8 (AP-13)	3.3.1-74	C
			Indoor Air (Internal)	None	None	VII.J-8 (AP-13)	3.3.1-74	C, 2
Piping and fittings	Pressure Boundary	Brass	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Indoor Air (Internal)	None	None	V.F-4 (EP-10)	3.2.1-35	A, 2
		Copper	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Indoor Air (Internal)	None	None	V.F-4 (EP-10)	3.2.1-35	A, 2

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. Ventilation system duct bolting is similar to structural bolting in that it provides structural support for ventilation system assemblies, which is functionally different from piping system pressure retaining closure bolting. The Bolting Integrity program does not provide for long-term condition monitoring inspections of ventilation duct bolting. Therefore, the Structures Monitoring Program is appropriate to detect and manage the aging effects of ventilation system duct bolting by periodic visual inspection.
2. Ventilation system components in the scope of license renewal at Oyster Creek are not subject to internal condensation. A review of the maintenance history of these components has not identified degradation due to the presence of internal condensation. Preventive maintenance activities and system manager walkdowns have not identified or reported internal condensation or resulting internal ventilation system degradation in these components. Therefore, the internal environment for ventilation system components in the scope of license renewal is "Indoor Air (Internal)."
3. The aging effects for stainless steel ventilation closure bolting in an indoor environment is none. This is consistent with industry guidance.

Table 3.3.2.1.2
4160V Switchgear Room Ventilation
Summary of Aging Management Evaluation

Table 3.3.2.1.2 4160V Switchgear Room Ventilation

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bird Screen	Filter	Galvanized Steel	Indoor Air (External)	None	None	VII.J-8 (AP-13)	3.3.1-74	C
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-4 (AP-27)	3.3.1-35	E, 1
		Stainless Steel	Indoor Air (External)	None	None			G, 3
Damper housing	Pressure Boundary	Galvanized Steel	Indoor Air (External)	None	None	VII.J-8 (AP-13)	3.3.1-74	C
			Indoor Air (Internal)	None	None	VII.J-8 (AP-13)	3.3.1-74	C, 2
Fan Housing	Pressure Boundary	Aluminum	Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	C
			Indoor Air (Internal)	None	None	V.F-2 (EP-3)	3.2.1-32	C, 2

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. Ventilation system duct bolting is similar to structural bolting in that it provides structural support for ventilation system assemblies, which is functionally different from piping system pressure retaining closure bolting. The Bolting Integrity program does not provide for long-term condition monitoring inspections of ventilation duct bolting. Therefore, the Structures Monitoring Program is appropriate to detect and manage the aging effects of ventilation system duct bolting by periodic visual inspection.
2. Ventilation system components in the scope of license renewal at Oyster Creek are not subject to internal condensation. A review of the maintenance history of these components has not identified degradation due to the presence of internal condensation. Preventive maintenance activities and system manager walkdowns have not identified or reported internal condensation or resulting internal ventilation system degradation in these components. Therefore, the internal environment for ventilation system components in the scope of license renewal is "Indoor Air (Internal)."
3. The aging effects for stainless steel ventilation closure bolting in an indoor environment is none. This is consistent with industry guidance.

Table 3.3.2.1.3
480V Switchgear Room Ventilation
Summary of Aging Management Evaluation

Table 3.3.2.1.3 480V Switchgear Room Ventilation

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bird Screen	Filter	Aluminum	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
		Stainless Steel	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-4 (AP-27)	3.3.1-35	E, 2
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-1 (AP-28)	3.3.1-36	E, 2
		Stainless Steel	Indoor Air (External)	None	None			G, 3
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	A
Damper housing	Pressure Boundary	Aluminum	Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	C
			Indoor Air (Internal)	None	None	V.F-2 (EP-3)	3.2.1-32	C, 1

Table 3.3.2.1.3 480V Switchgear Room Ventilation (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Damper housing	Pressure Boundary	Aluminum	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
		Galvanized Steel	Indoor Air (External)	None	None	VII.J-8 (AP-13)	3.3.1-74	C
			Indoor Air (Internal)	None	None	VII.J-8 (AP-13)	3.3.1-74	C, 1
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
Door Seal	Pressure Boundary	Elastomer	Indoor Air (External)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F2-7 (A-36)	3.3.1-10	E
				Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F2-8 (A-73)	3.3.1-28	E
			Indoor Air (Internal)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F2-10 (A-17)	3.3.1-10	E
				Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F2-9 (A-18)	3.3.1-28	E
			Outdoor Air (External)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)			G
				Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G

Table 3.3.2.1.3 480V Switchgear Room Ventilation (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Ductwork	Pressure Boundary	Galvanized Steel	Indoor Air (External)	None	None	VII.J-8 (AP-13)	3.3.1-74	C
			Indoor Air (Internal)	None	None	VII.J-8 (AP-13)	3.3.1-74	C, 1
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
Fan Housing	Pressure Boundary	Carbon and low alloy steel	Indoor Air (Internal)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F2-2 (A-08)	3.3.1-16	E
			Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.I-8 (A-78)	3.3.1-12	E
Filter Housing	Pressure Boundary	Galvanized Steel	Indoor Air (Internal)	None	None	VII.J-8 (AP-13)	3.3.1-74	C, 1
			Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G
Flexible Connection	Pressure Boundary	Elastomer	Indoor Air (Internal)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F2-10 (A-17)	3.3.1-10	E
			Outdoor Air (External)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)			G
Louvers	Pressure Boundary	Aluminum	Indoor Air (Internal)	None	None	V.F-2 (EP-3)	3.2.1-32	C, 1

Table 3.3.2.1.3 480V Switchgear Room Ventilation (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Louvers	Pressure Boundary	Aluminum	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
		Galvanized Steel	Indoor Air (Internal)	None	None	VII.J-8 (AP-13)	3.3.1-74	C, 1
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
Piping and fittings	Pressure Boundary	Brass	Indoor Air (Internal)	None	None	V.F-4 (EP-10)	3.2.1-35	A, 1
			Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G
		Copper	Indoor Air (Internal)	None	None	V.F-4 (EP-10)	3.2.1-35	A, 1
			Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G
Sensor Element	Pressure Boundary	Stainless Steel	Indoor Air (Internal)	None	None	VII.J-17 (AP-17)	3.3.1-76	C, 1
			Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G
Valve Body	Pressure Boundary	Brass	Indoor Air (Internal)	None	None	V.F-4 (EP-10)	3.2.1-35	A, 1

Table 3.3.2.1.3 480V Switchgear Room Ventilation (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Brass	Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. Ventilation system components in the scope of license renewal at Oyster Creek are not subject to internal condensation. A review of the maintenance history of these components has not identified degradation due to the presence of internal condensation. Preventive maintenance activities and system manager walkdowns have not identified or reported internal condensation or resulting internal ventilation system degradation in these components. Therefore, the internal environment for ventilation system components in the scope of license renewal is "Indoor Air (Internal)."
2. Ventilation system duct bolting is similar to structural bolting in that it provides structural support for ventilation system assemblies, which is functionally different from piping system pressure retaining closure bolting. The Bolting Integrity program does not provide for long-term condition monitoring inspections of ventilation duct bolting. Therefore, the Structures Monitoring Program is appropriate to detect and manage the aging effects of ventilation system duct bolting by periodic visual inspection.
3. The aging effects for stainless steel ventilation closure bolting in an indoor environment is none. This is consistent with industry guidance.

Table 3.3.2.1.4
Battery and MG Set Room Ventilation
Summary of Aging Management Evaluation

Table 3.3.2.1.4 Battery and MG Set Room Ventilation

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bird Screen	Filter	Aluminum	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-4 (AP-27)	3.3.1-35	E, 3
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-1 (AP-28)	3.3.1-36	E, 3
		Stainless Steel	Indoor Air (External)	None	None			G, 1
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	A
Damper housing	Pressure Boundary	Galvanized Steel	Indoor Air (External)	None	None	VII.J-8 (AP-13)	3.3.1-74	C
			Indoor Air (Internal)	None	None	VII.J-8 (AP-13)	3.3.1-74	C, 2
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C

Table 3.3.2.1.4 Battery and MG Set Room Ventilation (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Door Seal	Pressure Boundary	Elastomer	Indoor Air (Internal)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F2-10 (A-17)	3.3.1-10	E
				Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F2-9 (A-18)	3.3.1-28	E
			Outdoor Air (External)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)			G
				Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G
Ductwork	Pressure Boundary	Galvanized Steel	Indoor Air (External)	None	None	VII.J-8 (AP-13)	3.3.1-74	C
			Indoor Air (Internal)	None	None	VII.J-8 (AP-13)	3.3.1-74	C, 2
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
Fan Housing	Pressure Boundary	Carbon and low alloy steel	Indoor Air (Internal)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F2-2 (A-08)	3.3.1-16	E
			Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.I-8 (A-78)	3.3.1-12	E
Filter Housing	Pressure Boundary	Galvanized Steel	Indoor Air (Internal)	None	None	VII.J-8 (AP-13)	3.3.1-74	C, 2

Table 3.3.2.1.4 Battery and MG Set Room Ventilation (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Filter Housing	Pressure Boundary	Galvanized Steel	Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G
Flexible Connection	Pressure Boundary	Elastomer	Indoor Air (Internal)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F2-10 (A-17)	3.3.1-10	E
			Outdoor Air (External)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)			G
Flow Element (Pitot Tube)	Pressure Boundary	Copper	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Indoor Air (Internal)	None	None	V.F-4 (EP-10)	3.2.1-35	A, 2
Louvers	Pressure Boundary	Aluminum	Indoor Air (Internal)	None	None	V.F-2 (EP-3)	3.2.1-32	C, 2
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
Piping and fittings	Pressure Boundary	Brass	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Indoor Air (Internal)	None	None	V.F-4 (EP-10)	3.2.1-35	A, 2
			Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G

Table 3.3.2.1.4 Battery and MG Set Room Ventilation (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Copper	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Indoor Air (Internal)	None	None	V.F-4 (EP-10)	3.2.1-35	A, 2
			Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G
Sensor Element (Temperature)	Pressure Boundary	Copper	Indoor Air (Internal)	None	None	V.F-4 (EP-10)	3.2.1-35	A, 2
			Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G
Valve Body	Pressure Boundary	Brass	Indoor Air (Internal)	None	None	V.F-4 (EP-10)	3.2.1-35	A, 2
			Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The aging effects for stainless steel ventilation closure bolting in an indoor environment is none. This is consistent with industry guidance.
2. Ventilation system components in the scope of license renewal at Oyster Creek are not subject to internal condensation. A review of the maintenance history of these components has not identified degradation due to the presence of internal condensation. Preventive maintenance activities and system manager walkdowns have not identified or reported internal condensation or resulting internal ventilation system degradation in these components. Therefore, the internal environment for ventilation system components in the scope of license renewal is "Indoor Air (Internal)."
3. Ventilation system duct bolting is similar to structural bolting in that it provides structural support for ventilation system assemblies, which is functionally different from piping system pressure retaining closure bolting. The Bolting Integrity program does not provide for long-term condition monitoring inspections of ventilation duct bolting. Therefore, the Structures Monitoring Program is appropriate to detect and manage the aging effects of ventilation system duct bolting by periodic visual inspection.

Table 3.3.2.1.5
Chlorination System
Summary of Aging Management Evaluation

Table 3.3.2.1.5 Chlorination System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.H1-8 (A-24)	3.3.1-16	E
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-18 (A-32)	3.3.1-63	A
		Cast Iron	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-18 (A-32)	3.3.1-63	A
					Selective Leaching of Materials (B.1.25)	VII.C1-9 (A-51)	3.3.1-67	A
		Polypropylene	Outdoor Air (External)	None	None			F, 1

Table 3.3.2.1.5 Chlorination System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Leakage Boundary	Polypropylene	Raw Water – Salt Water (Internal)	None	None			F, 1
		Polyvinyl Chloride (PVC, CPVC)	Outdoor Air (External)	None	None			F, 1
			Raw Water – Salt Water (Internal)	None	None			F, 1
Valve Body	Leakage Boundary	Carbon and low alloy steel	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.H1-8 (A-24)	3.3.1-16	E
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-18 (A-32)	3.3.1-63	A
		Cast Iron	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-18 (A-32)	3.3.1-63	A
					Selective Leaching of Materials (B.1.25)	VII.C1-9 (A-51)	3.3.1-67	A
		Polyvinyl Chloride (PVC, CPVC)	Outdoor Air (External)	None	None			F, 1
			Raw Water – Salt Water (Internal)	None	None			F, 1

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. Polypropylene and Polyvinyl Chloride (PVC, CPVC) have no aging effects for identified environment based on industry standards.

Table 3.3.2.1.6
Circulating Water System
Summary of Aging Management Evaluation

Table 3.3.2.1.6 Circulating Water System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
		Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
Expansion Joint	Leakage Boundary	Elastomer	Indoor Air (External)	Change in Material Properties	Structures Monitoring Program (B.1.31)	VII.F3-7 (A-36)	3.3.1-10	E
		Elastomer (Tube)	Raw Water – Salt Water (Internal)	Change in Material Properties	Periodic Inspection Program (B.2.5)			G
Flow Glass	Leakage Boundary	Copper Alloy	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Raw Water – Salt Water (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.C1-7 (A-44)	3.3.1-57	E, 3

Table 3.3.2.1.6 Circulating Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flow Glass	Leakage Boundary	Copper Alloy	Raw Water – Salt Water (Internal)	Loss of Material	Selective Leaching of Materials (B.1.25)	VII.C1-8 (A-47)	3.3.1-65	A
		Glass	Indoor Air (External)	None	None	VII.J-10 (AP-14)	3.3.1-75	A
			Raw Water – Salt Water (Internal)	None	None	VII.J-13 (AP-50)	3.3.1-75	A
Flow Indicator	Leakage Boundary	Copper Alloy	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Raw Water – Salt Water (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.C1-7 (A-44)	3.3.1-57	E, 3
					Selective Leaching of Materials (B.1.25)	VII.C1-8 (A-47)	3.3.1-65	A
Level Glass	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Salt Water (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.C1-18 (A-32)	3.3.1-63	E, 3
		Copper Alloy	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Raw Water – Salt Water (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.C1-7 (A-44)	3.3.1-57	E, 3

Table 3.3.2.1.6 Circulating Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Level Glass	Leakage Boundary	Copper Alloy	Raw Water – Salt Water (Internal)	Loss of Material	Selective Leaching of Materials (B.1.25)	VII.C1-8 (A-47)	3.3.1-65	A
		Glass	Indoor Air (External)	None	None	VII.J-10 (AP-14)	3.3.1-75	A
			Raw Water – Salt Water (Internal)	None	None	VII.J-13 (AP-50)	3.3.1-75	A
Piping and fittings	Leakage Boundary	Brass	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Raw Water – Salt Water (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.C1-7 (A-44)	3.3.1-57	E, 3
					Selective Leaching of Materials (B.1.25)	VII.C1-8 (A-47)	3.3.1-65	A, 2
		Bronze	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Raw Water – Salt Water (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.C1-7 (A-44)	3.3.1-57	E, 1, 3
		Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Salt Water (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.C1-18 (A-32)	3.3.1-63	E, 3

Table 3.3.2.1.6 Circulating Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Leakage Boundary	Copper	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Raw Water – Salt Water (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.C1-7 (A-44)	3.3.1-57	E, 3
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Salt Water (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.C1-15 (A-54)	3.3.1-58	E, 3
Strainer Body	Leakage Boundary	Copper Alloy	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Raw Water – Salt Water (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.C1-7 (A-44)	3.3.1-57	E, 3
					Selective Leaching of Materials (B.1.25)	VII.C1-8 (A-47)	3.3.1-65	A
Thermowell	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E

Table 3.3.2.1.6 Circulating Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Thermowell	Leakage Boundary	Carbon and low alloy steel	Raw Water – Salt Water (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.C1-18 (A-32)	3.3.1-63	E, 3
Valve Body	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Salt Water (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.C1-18 (A-32)	3.3.1-63	E, 3
		Cast Iron	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Salt Water (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.C1-18 (A-32)	3.3.1-63	E, 3
					Selective Leaching of Materials (B.1.25)	VII.C1-9 (A-51)	3.3.1-67	A
		Copper Alloy	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Raw Water – Salt Water (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.C1-7 (A-44)	3.3.1-57	E, 3
					Selective Leaching of Materials (B.1.25)	VII.C1-8 (A-47)	3.3.1-65	A
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Table 3.3.2.1.6 Circulating Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Leakage Boundary	Stainless Steel	Raw Water – Salt Water (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.C1-15 (A-54)	3.3.1-58	E, 3

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. Material is bronze ASTM designation B61 which contains < 15% Zn, therefore, the aging mechanism of selective leaching does not apply.
2. Material is brass ASTM designation B43 or B135 which contains > 15% Zn, therefore, the aging mechanism of selective leaching applies.
3. The Periodic Inspection Program will be used to manage the aging effects in the raw water - salt water environment for the Circulating Water System.

Table 3.3.2.1.7
Containment Inerting System
Summary of Aging Management Evaluation

Table 3.3.2.1.7 Containment Inerting System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
			Outdoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-1 (AP-28)	3.3.1-36	B
				Loss Of Preload	Bolting Integrity (B.1.12)			H, 1
		Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
			Outdoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-1 (AP-28)	3.3.1-36	B
				Loss Of Preload	Bolting Integrity (B.1.12)			H, 1

Table 3.3.2.1.7 Containment Inerting System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Drain Trap	Pressure Boundary	Cast Iron (Body)	Condensation (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.F3-3 (A-13)	3.3.1-19	E
					Selective Leaching of Materials (B.1.25)	VII.C1-9 (A-51)	3.3.1-67	A
			Dry Gas (Internal)	None	None	VII.J-26 (AP-6)	3.3.1-79	A
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Flow Element	Pressure Boundary	Stainless Steel	Dry Gas (Internal)	None	None	VII.J-21 (AP-22)	3.3.1-79	A
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Piping and fittings	Pressure Boundary	Carbon and low alloy steel	Containment Atmosphere (Internal)	None	None	VII.F3-6 (A-11)	3.3.1-16	I, 2
			Dry Gas (Internal)	None	None	VII.J-26 (AP-6)	3.3.1-79	A
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-8 (A-78)	3.3.1-12	E

Table 3.3.2.1.7 Containment Inerting System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Copper	Dry Gas (Internal)	None	None	VII.J-5 (AP-9)	3.3.1-79	A
			Indoor Air (External)	None	None	VIII.I-2 (SP-6)	3.4.1-32	A
		Stainless Steel	Dry Gas (Internal)	None	None	VII.J-21 (AP-22)	3.3.1-79	A
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
Thermowell	Pressure Boundary	Carbon and low alloy steel	Dry Gas (Internal)	None	None	VII.J-26 (AP-6)	3.3.1-79	A
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Valve Body	Pressure Boundary	Carbon and low alloy steel	Containment Atmosphere (Internal)	None	None	VII.F3-6 (A-11)	3.3.1-16	I, 2
			Dry Gas (Internal)	None	None	VII.J-26 (AP-6)	3.3.1-79	A
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E

Table 3.3.2.1.7 Containment Inerting System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Carbon and low alloy steel	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-8 (A-78)	3.3.1-12	E
		Copper Alloy	Dry Gas (Internal)	None	None	VII.J-5 (AP-9)	3.3.1-79	A
			Indoor Air (External)	None	None	VIII.I-2 (SP-6)	3.4.1-32	A
		Stainless Steel	Dry Gas (Internal)	None	None	VII.J-21 (AP-22)	3.3.1-79	A
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. Closure bolting in an "Outdoor Air (External)" environment includes the aging effect/mechanism of "Loss of preload/stress relaxation".
2. Based on past precedence (NUREG-1796, Dresden and Quad Cities SER, paragraph 3.1.2.4.1), the Staff concluded that the loss of material due to corrosion is not considered a credible aging effect for carbon steel components in a containment nitrogen environment because of negligible amounts of free oxygen (less than 4 percent by volume during normal operation). Both oxygen and moisture must be present for general corrosion to occur because oxygen alone or water free of dissolved oxygen (high humidity in a nitrogen atmosphere) does not corrode carbon steel to any practical extent. The staff found the applicant’s identification of no loss of material for the carbon steel components exposed to a containment nitrogen environment acceptable because, with the negligible amounts of free oxygen, anodic reactions do not take place and the corrosion cell does not form. Therefore, no loss of material due to corrosion takes place and the aging effect is none.

Table 3.3.2.1.8
Containment Vacuum Breakers
Summary of Aging Management Evaluation

Table 3.3.2.1.8 Containment Vacuum Breakers

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	ASME Section XI, Subsection IWE (B.1.27)	VII.I-4 (AP-27)	3.3.1-35	E, 1
				Loss Of Preload	ASME Section XI, Subsection IWE (B.1.27)	VII.I-5 (AP-26)	3.3.1-35	E, 1
Expansion Joint	Pressure Boundary	Carbon and low alloy steel	Containment Atmosphere (Internal)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	II.B1.1-4 (C-21)	3.5.1-14	A
				Loss of Material	10 CFR Part 50, Appendix J (B.1.29)	II.B1.1-2 (C-19)	3.5.1-13	A
					ASME Section XI, Subsection IWE (B.1.27)	II.B1.1-2 (C-19)	3.5.1-13	B
			Indoor Air (External)	Loss of Material	10 CFR Part 50, Appendix J (B.1.29)	II.B1.1-2 (C-19)	3.5.1-13	A
					ASME Section XI, Subsection IWE (B.1.27)	II.B1.1-2 (C-19)	3.5.1-13	B
		Stainless Steel	Containment Atmosphere (Internal)	Cracking Initiation and Growth	10 CFR Part 50, Appendix J (B.1.29)	II.B1.1-5 (C-22)	3.5.1-18	A

Table 3.3.2.1.8 Containment Vacuum Breakers (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Expansion Joint	Pressure Boundary	Stainless Steel	Containment Atmosphere (Internal)	Cracking Initiation and Growth	ASME Section XI, Subsection IWE (B.1.27)	II.B1.1-5 (C-22)	3.5.1-18	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	II.B1.1-4 (C-21)	3.5.1-14	A
			Indoor Air (External)	Cracking Initation and Growth	10 CFR Part 50, Appendix J (B.1.29)	II.B1.1-5 (C-22)	3.5.1-18	A
					ASME Section XI, Subsection IWE (B.1.27)	II.B1.1-5 (C-22)	3.5.1-18	B
Piping and fittings	Pressure Boundary	Carbon and low alloy steel	Containment Atmosphere (Internal)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	II.B1.1-4 (C-21)	3.5.1-14	A
				Loss of Material	10 CFR Part 50, Appendix J (B.1.29)	V.C-1 (E-35)	3.2.1-2	E
					ASME Section XI, Subsection IWE (B.1.27)	V.C-1 (E-35)	3.2.1-2	E
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.C-1 (E-35)	3.2.1-2	E
			Indoor Air (Internal)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	II.B1.1-4 (C-21)	3.5.1-14	A
				Loss of Material	10 CFR Part 50, Appendix J (B.1.29)	V.C-1 (E-35)	3.2.1-2	E

Table 3.3.2.1.8 Containment Vacuum Breakers (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Carbon and low alloy steel	Indoor Air (Internal)	Loss of Material	ASME Section XI, Subsection IWE (B.1.27)	V.C-1 (E-35)	3.2.1-2	E
		Stainless Steel	Containment Atmosphere (Internal)	Cracking Initiation and Growth	10 CFR Part 50, Appendix J (B.1.29)	II.B1.1-5 (C-22)	3.5.1-18	C
					ASME Section XI, Subsection IWE (B.1.27)	II.B1.1-5 (C-22)	3.5.1-18	D
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	II.B1.1-4 (C-21)	3.5.1-14	A
			Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Treated Water <140F (Internal)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)			G
				Loss of Material	One-Time Inspection (B.1.24)	V.C-4 (E-33)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.C-4 (E-33)	3.2.1-3	E
Valve Body	Pressure Boundary	Carbon and low alloy steel	Containment Atmosphere (Internal)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	II.B1.1-4 (C-21)	3.5.1-14	C
				Loss of Material	10 CFR Part 50, Appendix J (B.1.29)	II.B1.1-2 (C-19)	3.5.1-13	C

Table 3.3.2.1.8 Containment Vacuum Breakers (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Carbon and low alloy steel	Containment Atmosphere (Internal)	Loss of Material	ASME Section XI, Subsection IWE (B.1.27)	II.B1.1-2 (C-19)	3.5.1-13	D
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.C-1 (E-35)	3.2.1-2	E
		Stainless Steel	Containment Atmosphere (Internal)	Cracking Initiation and Growth	10 CFR Part 50, Appendix J (B.1.29)	II.B1.1-5 (C-22)	3.5.1-18	C
					ASME Section XI, Subsection IWE (B.1.27)	II.B1.1-5 (C-22)	3.5.1-18	D
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	II.B1.1-4 (C-21)	3.5.1-14	C
			Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Treated Water <140F (Internal)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)			G
				Loss of Material	One-Time Inspection (B.1.24)	V.C-4 (E-33)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.C-4 (E-33)	3.2.1-3	E
Valve Body (Vacuum Breakers)	Pressure Boundary	Carbon and low alloy steel	Containment Atmosphere (Internal)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	II.B1.1-4 (C-21)	3.5.1-14	C

Table 3.3.2.1.8 Containment Vacuum Breakers (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body (Vacuum Breakers)	Pressure Boundary	Carbon and low alloy steel	Containment Atmosphere (Internal)	Loss of Material	10 CFR Part 50, Appendix J (B.1.29)	II.B1.1-2 (C-19)	3.5.1-13	C
					ASME Section XI, Subsection IWE (B.1.27)	II.B1.1-2 (C-19)	3.5.1-13	D
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.C-1 (E-35)	3.2.1-2	E

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. ASME Section XI, Subsection IWE is the proper aging management program for these components.

Table 3.3.2.1.9
Control Rod Drive System
Summary of Aging Management Evaluation

Table 3.3.2.1.9 Control Rod Drive System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Accumulator	Pressure Boundary	Carbon and low alloy steel	Dry Gas (Internal)	None	None	VII.J-26 (AP-6)	3.3.1-79	A
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
		Stainless Steel	Dry Gas (Internal)	None	None	VII.J-21 (AP-22)	3.3.1-79	A
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B

Table 3.3.2.1.9 Control Rod Drive System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Containment Atmosphere (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 2
			Indoor Air (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
						VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 2
						VII.I-5 (AP-26)	3.3.1-35	B
		Carbon and low alloy steel	Containment Atmosphere (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B

Table 3.3.2.1.9 Control Rod Drive System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Containment Atmosphere (External)	Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 2
			Indoor Air (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
						VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 2
						VII.I-5 (AP-26)	3.3.1-35	B
		High Strength Alloy Steel	Containment Atmosphere (External)	Cracking Initiation and Growth	Bolting Integrity (B.1.12)	VII.E1-1 (A-104)	3.3.1-7	E, 3
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A, 3
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B, 3
				Loss of Preload	Bolting Integrity (B.1.12)	IV.C1-12 (R-27)	3.1.1-44	B, 3

Table 3.3.2.1.9 Control Rod Drive System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Filter	Filter	Stainless Steel	Treated Water < 140F (External)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
Filter Housing	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
Flow Element	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B

Table 3.3.2.1.9 Control Rod Drive System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Gauge Snubber	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
Gear Box	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.E4-17 (AP-30)	3.3.1-16	E
					One-Time Inspection (B.1.24)	VII.E4-17 (AP-30)	3.3.1-16	E
Piping and fittings	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
	Pressure Boundary	Carbon and low alloy steel	Containment Atmosphere (External)	None	None	VII.I-7 (A-77)	3.3.1-12	I, 1

Table 3.3.2.1.9 Control Rod Drive System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.E4-17 (AP-30)	3.3.1-16	E
					One-Time Inspection (B.1.24)	VII.E4-17 (AP-30)	3.3.1-16	E
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-2 (R-55)	3.1.1-21	B
					One-Time Inspection (B.1.24)	IV.C1-2 (R-55)	3.1.1-21	A
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
				Not Applicable	None	IV.C1-1 (R-03)	3.1.1-9	I, 4
		Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A

Table 3.3.2.1.9 Control Rod Drive System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-1 (R-03)	3.1.1-9	B
						IV.C1-2 (R-55)	3.1.1-21	B
					One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	A
						IV.C1-2 (R-55)	3.1.1-21	A
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B

Table 3.3.2.1.9 Control Rod Drive System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
Pump Casing	Pressure Boundary	Carbon and low alloy steel (Oil pump)	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.E4-17 (AP-30)	3.3.1-16	E
					One-Time Inspection (B.1.24)	VII.E4-17 (AP-30)	3.3.1-16	E
		Stainless Steel (CRD pump)	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
Restricting Orifice	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A

Table 3.3.2.1.9 Control Rod Drive System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Restricting Orifice	Pressure Boundary	Stainless Steel	Treated Water <140F (Internal)	Loss of Material	Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
	Throttle	Stainless Steel	Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
Rupture Disks	Pressure Boundary	Stainless Steel	Dry Gas (Internal)	None	None	VII.J-21 (AP-22)	3.3.1-79	A
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Strainer	Filter	Stainless Steel	Treated Water < 140F (External)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
Strainer Body	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E

Table 3.3.2.1.9 Control Rod Drive System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Strainer Body	Pressure Boundary	Carbon and low alloy steel	Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
Valve Body	Leakage Boundary	Stainless Steel	Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
	Pressure Boundary	Brass	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.K-1 (AP-70)	3.3.1-23	E
					Selective Leaching of Materials (B.1.25)	VII.C2-6 (AP-32)	3.3.1-65	A

Table 3.3.2.1.9 Control Rod Drive System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Brass	Treated Water (Internal)	Loss of Material	Water Chemistry (B.1.2)	VII.K-1 (AP-70)	3.3.1-23	E
		Carbon and low alloy steel	Containment Atmosphere (External)	None	None	VII.I-7 (A-77)	3.3.1-12	I, 1
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.E4-17 (AP-30)	3.3.1-16	E
					One-Time Inspection (B.1.24)	VII.E4-17 (AP-30)	3.3.1-16	E
			Treated Water (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	IV.C1-2 (R-55)	3.1.1-21	E, 5, 6
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
				Not Applicable	None	IV.C1-1 (R-03)	3.1.1-9	I, 4, 5

Table 3.3.2.1.9 Control Rod Drive System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Indoor Air (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Treated Water (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	E, 5, 6
						IV.C1-2 (R-55)	3.1.1-21	E, 5, 6
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	E, 5, 6
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. Based on past precedence (NUREG-1796, Dresden and Quad Cities SER, paragraph 3.1.2.4.1), the Staff concluded that the loss of material due to corrosion is not considered a credible aging effect for carbon steel components in a containment nitrogen environment because of negligible amounts of free oxygen (less than 4 percent by volume during normal operation). Both oxygen and moisture must be present for general corrosion to occur because oxygen alone or water free of dissolved oxygen (high humidity in a nitrogen atmosphere) does not corrode carbon steel to any practical extent. The staff found the applicant's identification of no loss of material for the carbon steel components exposed to a containment nitrogen environment acceptable because, with the negligible amounts of free oxygen, anodic reactions do not take place and the corrosion cell does not form. Therefore, no loss of material due to corrosion takes place and the aging effect is none.
2. Line item IV.C1-12 (R-27) for loss of preload for RCPB closure bolting does not apply since the A 193 B7 alloy steel closure bolting is not high-strength. Line item V.E-5 (EP-24) has been applied to the loss of preload aging effect for RCPB closure bolting.
3. Control Rod Drive flange bolting is high strength.
4. SCC and IGSCC of carbon and low alloy steel are not considered applicable aging mechanisms in a treated water environment per EPRI Mechanical Tools Appendix A.
5. The applicable programs for the aging effect of cracking as identified in line items IV.C1-1 (R-03) and IV.C1-2 (R-55) for class 1 piping, fittings and branch connections < NPS 4 have been applied to Class 1 valves < NPS 4.

6. ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD does not apply to valves.

Table 3.3.2.1.10
Control Room HVAC
Summary of Aging Management Evaluation

Table 3.3.2.1.10 Control Room HVAC

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bird Screen	Filter	Aluminum	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
		Galvanized Steel	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-4 (AP-27)	3.3.1-35	E, 5
		Galvanized Steel	Indoor Air (External)	None	None			G, 4
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	A
		Stainless Steel	Indoor Air (External)	None	None			G, 4
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	A
Damper housing	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.F1-1 (A-10)	3.3.1-16	E

Table 3.3.2.1.10 Control Room HVAC (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Damper housing	Pressure Boundary	Carbon and low alloy steel	Indoor Air (Internal)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F1-2 (A-08)	3.3.1-16	E
		Galvanized Steel	Indoor Air (External)	None	None	VII.J-8 (AP-13)	3.3.1-74	C
			Indoor Air (Internal)	None	None	VII.J-8 (AP-13)	3.3.1-74	C, 1
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
Door Seal	Pressure Boundary	Elastomer	Indoor Air (External)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F1-8 (A-36)	3.3.1-10	E
				Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F1-9 (A-73)	3.3.1-28	E
			Indoor Air (Internal)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F1-11 (A-17)	3.3.1-10	E
				Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F1-10 (A-18)	3.3.1-28	E
			Outdoor Air (External)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)			G
				Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G

Table 3.3.2.1.10 Control Room HVAC (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Ductwork	Pressure Boundary	Galvanized Steel	Indoor Air (External)	None	None	VII.J-8 (AP-13)	3.3.1-74	C
			Indoor Air (Internal)	None	None	VII.J-8 (AP-13)	3.3.1-74	C, 1
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
Fan Housing	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F1-1 (A-10)	3.3.1-16	E
			Indoor Air (Internal)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F1-1 (A-10)	3.3.1-16	E
		Galvanized Steel	Indoor Air (Internal)	None	None	VII.J-8 (AP-13)	3.3.1-74	C, 1
			Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G
Filter Housing	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F1-1 (A-10)	3.3.1-16	E
			Indoor Air (Internal)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F1-2 (A-08)	3.3.1-16	E
		Galvanized Steel	Indoor Air (Internal)	None	None	VII.J-8 (AP-13)	3.3.1-74	C, 1

Table 3.3.2.1.10 Control Room HVAC (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Filter Housing	Pressure Boundary	Galvanized Steel	Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G
Flexible Connection	Pressure Boundary	Elastomer	Indoor Air (External)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F1-8 (A-36)	3.3.1-10	E
			Indoor Air (Internal)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F1-11 (A-17)	3.3.1-10	E
Heat Exchangers (Condensing Coil)	Heat Transfer	Copper (coils)	Outdoor Air (External)	Reduction of Heat Transfer	Periodic Inspection of Ventilation Systems (B.2.4)			G
			Refrigerant (Internal)	None	None			G, 3
		Copper (fins)	Outdoor Air (External)	Reduction of Heat Transfer	Periodic Inspection of Ventilation Systems (B.2.4)			G
	Pressure Boundary	Copper (coils)	Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G
			Refrigerant (Internal)	None	None	VII.J-5 (AP-9)	3.3.1-79	C
Heat Exchangers (Evaporator Coil)	Heat Transfer	Aluminum (fins)	Indoor Air (External)	Reduction of Heat Transfer	Periodic Inspection of Ventilation Systems (B.2.4)			G, 2

Table 3.3.2.1.10 Control Room HVAC (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchangers (Evaporator Coil)	Heat Transfer	Copper (coils)	Indoor Air (External)	Reduction of Heat Transfer	Periodic Inspection of Ventilation Systems (B.2.4)			G, 2
			Refrigerant (Internal)	None	None			G, 3
	Pressure Boundary	Copper (coils)	Indoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F1-17 (A-46)	3.3.1-23	E, 2
			Refrigerant (Internal)	None	None	VII.J-5 (AP-9)	3.3.1-79	C
Heater Housing	Pressure Boundary	Galvanized Steel	Indoor Air (Internal)	None	None	VII.J-8 (AP-13)	3.3.1-74	C, 1
			Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G
Louvers	Pressure Boundary	Aluminum	Indoor Air (Internal)	None	None	V.F-2 (EP-3)	3.2.1-32	C, 1
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
		Galvanized Steel	Indoor Air (Internal)	None	None	VII.J-8 (AP-13)	3.3.1-74	C, 1
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C

Table 3.3.2.1.10 Control Room HVAC (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Brass	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Indoor Air (Internal)	None	None	V.F-4 (EP-10)	3.2.1-35	A, 1
			Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G
			Refrigerant (Internal)	None	None	VII.J-5 (AP-9)	3.3.1-79	A
		Copper	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Indoor Air (Internal)	None	None	V.F-4 (EP-10)	3.2.1-35	A, 1
			Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G
			Refrigerant (Internal)	None	None	VII.J-5 (AP-9)	3.3.1-79	A
		Polyvinyl Chloride (PVC, CPVC)	Outdoor Air (External)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)			F, 6
			Raw Water – Fresh Water (Internal)	None	None			F, 7

Table 3.3.2.1.10 Control Room HVAC (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Indoor Air (Internal)	None	None	VII.J-17 (AP-17)	3.3.1-76	A, 1
			Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. Ventilation system components in the scope of license renewal at Oyster Creek are not subject to internal condensation. A review of the maintenance history of these components has not identified degradation due to the presence of internal condensation. Preventive maintenance activities and system manager walkdowns have not identified or reported internal condensation or resulting internal ventilation system degradation in these components. Therefore, the internal environment for ventilation system components in the scope of license renewal is "Indoor Air (Internal)."
2. The refrigeration evaporator coils and fins are a continuously wetted surface due to condensation.
3. Copper heat exchanger tubes with refrigerant gas are not addressed in NUREG-1801. Aging effects are based on industry standards (EPRI Mechanical Tools Appendix G).
4. The aging effects for stainless steel and galvanized ventilation closure bolting in an indoor air environment is none. This is consistent with industry guidance.
5. Ventilation system duct bolting is similar to structural bolting in that it provides structural support for ventilation system assemblies, which is functionally different from piping system pressure retaining closure bolting. The Bolting Integrity program does not provide for long-term condition monitoring inspections of ventilation duct bolting. Therefore, the Structures Monitoring Program is appropriate to detect and manage the aging effects of ventilation system duct bolting by periodic visual inspection.
6. Polyvinyl Chloride has a change in material properties when exposed to ultraviolet radiation (sunlight). This is consistent with industry guidance.

The CR HVAC B Unit and PVC drain line are roof mounted.
no aging effects for identified environment based on industry standards.

7. Polyvinyl Chloride has no aging effects for the identified raw water environment based on industry standards..

Table 3.3.2.1.11
Cranes and Hoists
Summary of Aging Management Evaluation

Table 3.3.2.1.11 Cranes and Hoists

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Crane (Bridge; Trolley)	Structural Support	Carbon and low alloy steel	Indoor Air	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	VII.B-2 (A-06)	3.3.1-1	A
			Outdoor Air	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)			G
Crane (Bridge; Trolley; Girders)	Structural Support	Carbon and low alloy steel	Indoor Air	Loss of Material	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.1.16)	VII.B-3 (A-07)	3.3.1-55	B
			Outdoor Air	Loss of Material	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.1.16)	III.A.3-12 (T-11)	3.5.1-21	E, 1
Hoists (Jib Crane Columns, Beams, Plates, Anchorage)	Structural Support	Carbon and low alloy steel	Indoor Air	Loss of Material	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.1.16)	VII.B-3 (A-07)	3.3.1-55	B
Hoists (Monorail Beams, Lifting Devices, Plates)	Structural Support	Carbon and low alloy steel	Indoor Air	Loss of Material	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.1.16)	VII.B-3 (A-07)	3.3.1-55	B

Table 3.3.2.1.11 Cranes and Hoists (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Rail System (Rail, Plates, Clips)	Structural Support	Carbon and low alloy steel	Indoor Air	Loss of Material	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.1.16)	VII.B-1 (A-05)	3.3.1-56	B
						VII.B-3 (A-07)	3.3.1-55	B
			Outdoor Air	Loss of Material	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.1.16)	III.A3-12 (T-11)	3.5.1-21	E, 3
Structural Bolts	Structural Support	Carbon and low alloy steel	Indoor Air	Loss of Material	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.1.16)	VII.I-4 (AP-27)	3.3.1-35	E, 2
				Loss Of Preload	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.1.16)	VII.I-5 (AP-26)	3.3.1-35	E, 2
			Outdoor Air	Loss of Material	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.1.16)	VII.I-1 (AP-28)	3.3.1-36	E, 2
				Loss Of Preload	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.1.16)			H, 2

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. Environment is not in NUREG-1801 for this component; but the material environment combination is evaluated. The Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems program is the applicable Aging Management Program for the component instead of Structures Monitoring Program.
2. The Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems program is the applicable Aging Management Program for the component instead of the Structures Monitoring Program.
3. Loss of material includes loss of material due to general corrosion and loss of material due to wear for this component.

Table 3.3.2.1.12
Drywell Floor and Equipment Drains
Summary of Aging Management Evaluation

Table 3.3.2.1.12 Drywell Floor and Equipment Drains

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Containment Atmosphere (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
			Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	V.E-4 (EP-25)	3.2.1-25	B
						VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B
						VII.I-5 (AP-26)	3.3.1-35	B
		Carbon and low alloy steel	Containment Atmosphere (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B

Table 3.3.2.1.12 Drywell Floor and Equipment Drains (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	V.E-4 (EP-25)	3.2.1-25	B
						VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B
						VII.I-5 (AP-26)	3.3.1-35	B
Flow Element	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-1 (SP-52)	3.4.1-11	E
Flow Glass	Leakage Boundary	Carbon and low alloy steel	Containment Atmosphere (External)	None	None	VII.I-7 (A-77)	3.3.1-12	I, 3
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-2 (SP-51)	3.4.1-6	E, 1
		Glass	Containment Atmosphere (External)	None	None	VII.J-10 (AP-14)	3.3.1-75	A
			Raw Water – Fresh Water (Internal)	None	None	VII.J-13 (AP-50)	3.3.1-75	A

Table 3.3.2.1.12 Drywell Floor and Equipment Drains (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchanger (DWEDT)	Leakage Boundary	Carbon and low alloy steel (Covers)	Containment Atmosphere (External)	None	None	VII.I-7 (A-77)	3.3.1-12	I, 2, 3
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-2 (SP-51)	3.4.1-6	E, 1, 2
		Stainless Steel (Nozzles, Plates)	Containment Atmosphere (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A, 2
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-1 (SP-52)	3.4.1-11	E, 1, 2
	Structural Support	Stainless Steel (Carrying Bars)	Containment Atmosphere (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A, 2
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Containment Atmosphere (External)	None	None	VII.I-7 (A-77)	3.3.1-12	I, 3
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-2 (SP-51)	3.4.1-6	E
			Soil (External)	Loss of Material	Buried Piping Inspection (B.1.26)	VII.C1-19 (A-01)	3.3.1-18	B
		Stainless Steel	Containment Atmosphere (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Table 3.3.2.1.12 Drywell Floor and Equipment Drains (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-1 (SP-52)	3.4.1-11	E
	Pressure Boundary	Carbon and low alloy steel	Containment Atmosphere (External)	None	None	VII.I-7 (A-77)	3.3.1-12	I, 3
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.E-7 (E-44)	3.2.1-2	E
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.C-8 (E-32)	3.2.1-5	E, 4
		Stainless Steel	Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.C-5 (E-34)	3.2.1-8	E
Pump Casing (DWEDT pumps)	Leakage Boundary	Cast Iron	Containment Atmosphere (External)	None	None	VII.I-7 (A-77)	3.3.1-12	I, 3
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-2 (SP-51)	3.4.1-6	E
					Selective Leaching of Materials (B.1.25)	VII.C1-9 (A-51)	3.3.1-67	A

Table 3.3.2.1.12 Drywell Floor and Equipment Drains (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Tanks (DWEDT)	Leakage Boundary	Stainless Steel	Containment Atmosphere (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-1 (SP-52)	3.4.1-11	E
Valve Body	Leakage Boundary	Carbon and low alloy steel	Containment Atmosphere (External)	None	None	VII.I-7 (A-77)	3.3.1-12	I, 3
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-2 (SP-51)	3.4.1-6	E
		Stainless Steel	Containment Atmosphere (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-1 (SP-52)	3.4.1-11	E
	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.E-7 (E-44)	3.2.1-2	E
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.C-8 (E-32)	3.2.1-5	E

Table 3.3.2.1.12 Drywell Floor and Equipment Drains (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.C-5 (E-34)	3.2.1-8	E

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The One-Time Inspection program confirms the absence of aging effects in pooled or potentially stagnant flow areas of drain piping and piping elements.
2. Heat Exchanger is a plate type consisting of plates, covers, nozzles, and carrying bars.
3. Based on past precedence (NUREG-1796, Dresden and Quad Cities SER, paragraph 3.1.2.4.1), the Staff concluded that the loss of material due to corrosion is not considered a credible aging effect for carbon steel components in a containment nitrogen environment because of negligible amounts of free oxygen (less than 4 percent by volume during normal operation). Both oxygen and moisture must be present for general corrosion to occur because oxygen alone or water free of dissolved oxygen (high humidity in a nitrogen atmosphere) does not corrode carbon steel to any practical extent. The staff found the applicant’s identification of no loss of material for the carbon steel components exposed to a containment nitrogen environment acceptable because, with the negligible amounts of free oxygen, anodic reactions do not take place and the corrosion cell does not form. Therefore, no loss of material due to corrosion takes place and the aging effect is none.
4. The low pressure vessel flange drain line (CS) is intended to collect condensate that may leak past both vessel o-ring seals. Although this would originally have been treated water, it is considered to be a raw water - fresh water environment (in the same manner as the balance of the drywell floor and equipment drain water).

Table 3.3.2.1.13
Emergency Diesel Generator and Auxiliary System
Summary of Aging Management Evaluation

Table 3.3.2.1.13 Emergency Diesel Generator and Auxiliary System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bird Screen	Filter	Carbon and low alloy steel	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-8 (A-78)	3.3.1-12	E
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
			Outdoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-1 (AP-28)	3.3.1-36	B
				Loss Of Preload	Bolting Integrity (B.1.12)			H, 1
		Stainless Steel	Indoor Air (External)	Loss Of Preload	Bolting Integrity (B.1.12)			G, 9
			Outdoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)			G, 9
				Loss Of Preload	Bolting Integrity (B.1.12)			G, 9

Table 3.3.2.1.13 Emergency Diesel Generator and Auxiliary System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Ductwork	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.F4-1 (A-10)	3.3.1-16	E
			Indoor Air (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.F4-2 (A-08)	3.3.1-16	E
Exhaust Stack	Pressure Boundary	Carbon and low alloy steel	Diesel Engine Exhaust Gases (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.H2-2 (A-27)	3.3.1-17	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-8 (A-78)	3.3.1-12	E
Fan Housing (Dust Bin Blower Fan)	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.F4-1 (A-10)	3.3.1-16	E
			Indoor Air (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.F4-2 (A-08)	3.3.1-16	E
Fan Housing (Radiator Fan)	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.F4-1 (A-10)	3.3.1-16	E
			Indoor Air (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.F4-2 (A-08)	3.3.1-16	E
Filter (Inertial Air Bin)	Filter	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.F4-1 (A-10)	3.3.1-16	E
Filter (Oil Bath)	Filter	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.F4-1 (A-10)	3.3.1-16	E, 5

Table 3.3.2.1.13 Emergency Diesel Generator and Auxiliary System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Filter (Oil Bath)	Filter	Carbon and low alloy steel	Oil (External)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.F4-14 (AP-30)	3.3.1-16	E, 5
Filter Housing (Air Cooling)	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.F4-1 (A-10)	3.3.1-16	E
			Indoor Air (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.F4-2 (A-08)	3.3.1-16	E
Filter Housing (Fuel Oil)	Pressure Boundary	Carbon and low alloy steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-10 (A-30)	3.3.1-20	B
					One-Time Inspection (B.1.24)	VII.H1-10 (A-30)	3.3.1-20	A
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Filter Housing (Lube Oil)	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.H2-20 (AP-30)	3.3.1-16	E
					One-Time Inspection (B.1.24)	VII.H2-20 (AP-30)	3.3.1-16	E
Flame Arrestor (Fuel Oil Tank)	Filter	Galvanized Steel	Outdoor Air	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C

Table 3.3.2.1.13 Emergency Diesel Generator and Auxiliary System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flame Arrestor (Fuel Oil Tank)	Fire Barrier	Galvanized Steel	Outdoor Air	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
Flexible Hose	Pressure Boundary	Carbon and low alloy steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-10 (A-30)	3.3.1-20	B
					One-Time Inspection (B.1.24)	VII.H1-10 (A-30)	3.3.1-20	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.H1-8 (A-24)	3.3.1-16	E
Heat Exchanger (Lube Oil Cooler)	Heat Transfer	Aluminum (fins)	Lubricating Oil (External)	Reduction of Heat Transfer	Lubricating Oil Monitoring Activities (B.2.2)			F
		Brass (tubes)	Closed Cooling Water (Internal)	None	None			H, 7
			Lubricating Oil (External)	Reduction of Heat Transfer	Lubricating Oil Monitoring Activities (B.2.2)			G
	Pressure Boundary	Brass (tubes)	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.F1-13 (AP-34)	3.3.1-38	B
					Selective Leaching of Materials (B.1.25)	VII.F1-14 (AP-65)	3.3.1-65	A
			Lubricating Oil (External)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.H2-10 (AP-47)	3.3.1-24	E

Table 3.3.2.1.13 Emergency Diesel Generator and Auxiliary System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchanger (Lube Oil Cooler)	Pressure Boundary	Brass (tubes)	Lubricating Oil (External)	Loss of Material	One-Time Inspection (B.1.24)	VII.H2-10 (AP-47)	3.3.1-24	E
		Carbon and low alloy steel (shell side components)	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.H2-3 (AP-39)	3.3.1-21	E
					One-Time Inspection (B.1.24)	VII.H2-3 (AP-39)	3.3.1-21	E
Heat Exchangers (Radiator)	Heat Transfer	Aluminum (Fins)	Outdoor Air (External)	Reduction of Heat Transfer	Periodic Inspection Program (B.2.5)			F
		Brass (tubes)	Closed Cooling Water (Internal)	None	None			H, 7
			Outdoor Air (External)	Reduction of Heat Transfer	Periodic Inspection Program (B.2.5)			G
	Pressure Boundary	Brass (tube side components)	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.F1-13 (AP-34)	3.3.1-38	B
					Selective Leaching of Materials (B.1.25)	VII.F1-14 (AP-65)	3.3.1-65	A

Table 3.3.2.1.13 Emergency Diesel Generator and Auxiliary System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchangers (Radiator)	Pressure Boundary	Brass (tube side components)	Outdoor Air (External)	Loss of Material	Periodic Inspection Program (B.2.5)			G
		Brass (tubes)	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.F1-13 (AP-34)	3.3.1-38	B
					Selective Leaching of Materials (B.1.25)	VII.F1-14 (AP-65)	3.3.1-65	A
			Outdoor Air (External)	Loss of Material	Periodic Inspection Program (B.2.5)			G
Louvers	Direct Flow	Carbon and low alloy steel	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-8 (A-78)	3.3.1-12	E
Muffler	Pressure Boundary	Carbon and low alloy steel	Diesel Engine Exhaust Gases (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.H2-2 (A-27)	3.3.1-17	E
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Concrete (External)	None	None	VII.J-24 (AP-3)	3.3.1-78	A
			Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-10 (A-30)	3.3.1-20	B
					One-Time Inspection (B.1.24)	VII.H1-10 (A-30)	3.3.1-20	A

Table 3.3.2.1.13 Emergency Diesel Generator and Auxiliary System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-8 (A-78)	3.3.1-12	E
	Pressure Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.H2-24 (A-25)	3.3.1-42	B
					One-Time Inspection (B.1.24)	VII.H2-24 (A-25)	3.3.1-42	E, 3
			Concrete (External)	None	None	VII.J-24 (AP-3)	3.3.1-78	A
			Condensation (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.F4-3 (A-13)	3.3.1-19	E
			Diesel Engine Exhaust Gases (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.H2-2 (A-27)	3.3.1-17	E
			Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-10 (A-30)	3.3.1-20	B
					One-Time Inspection (B.1.24)	VII.H1-10 (A-30)	3.3.1-20	A
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.H2-20 (AP-30)	3.3.1-16	E

Table 3.3.2.1.13 Emergency Diesel Generator and Auxiliary System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Carbon and low alloy steel	Lubricating Oil (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.H2-20 (AP-30)	3.3.1-16	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.H1-8 (A-24)	3.3.1-16	E
		Stainless Steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-9 (A-52)	3.3.1-39	B
					One-Time Inspection (B.1.24)	VII.C2-9 (A-52)	3.3.1-39	E, 3
			Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-6 (AP-54)	3.3.1-54	B
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Indoor Air (Internal)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.H2-17 (AP-59)	3.3.1-27	E
					One-Time Inspection (B.1.24)	VII.H2-17 (AP-59)	3.3.1-27	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C

Table 3.3.2.1.13 Emergency Diesel Generator and Auxiliary System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pump Casing (Fuel Oil)	Pressure Boundary	Carbon and low alloy steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-10 (A-30)	3.3.1-20	B
					One-Time Inspection (B.1.24)	VII.H1-10 (A-30)	3.3.1-20	A
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Pump Casing (Lube Oil)	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.H2-20 (AP-30)	3.3.1-16	E
					One-Time Inspection (B.1.24)	VII.H2-20 (AP-30)	3.3.1-16	E
Restricting Orifice	Pressure Boundary	Brass	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.H2-8 (AP-12)	3.3.1-38	B
					Selective Leaching of Materials (B.1.25)	VII.H2-12 (AP-43)	3.3.1-65	A
			Indoor Air (External)	None	None	VIII.I-2 (SP-6)	3.4.1-32	A
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.H2-10 (AP-47)	3.3.1-24	E

Table 3.3.2.1.13 Emergency Diesel Generator and Auxiliary System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Restricting Orifice	Pressure Boundary	Brass	Lubricating Oil (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.H2-10 (AP-47)	3.3.1-24	E
	Throttle	Brass	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.H2-8 (AP-12)	3.3.1-38	B
					Selective Leaching of Materials (B.1.25)	VII.H2-12 (AP-43)	3.3.1-65	A
			Indoor Air (External)	None	None	VIII.I-2 (SP-6)	3.4.1-32	A
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.H2-10 (AP-47)	3.3.1-24	E
					One-Time Inspection (B.1.24)	VII.H2-10 (AP-47)	3.3.1-24	E
Sensor Element (Lube Oil)	Pressure Boundary	Aluminum	Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	A
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)			G, 2
					One-Time Inspection (B.1.24)			G, 2
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Table 3.3.2.1.13 Emergency Diesel Generator and Auxiliary System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Sensor Element (Lube Oil)	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.H2-17 (AP-59)	3.3.1-27	E
					One-Time Inspection (B.1.24)	VII.H2-17 (AP-59)	3.3.1-27	E
Sensor Element (Temperature Control Manifold)	Pressure Boundary	Brass	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.H2-8 (AP-12)	3.3.1-38	B
					Selective Leaching of Materials (B.1.25)	VII.H2-12 (AP-43)	3.3.1-65	A
			Indoor Air (External)	None	None	VIII.I-2 (SP-6)	3.4.1-32	A
		Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.H2-24 (A-25)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
		Stainless Steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-9 (A-52)	3.3.1-39	B
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Sight Glasses	Pressure Boundary	Aluminum	Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	A

Table 3.3.2.1.13 Emergency Diesel Generator and Auxiliary System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Sight Glasses	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.H2-20 (AP-30)	3.3.1-16	E
					One-Time Inspection (B.1.24)	VII.H2-20 (AP-30)	3.3.1-16	E
		Glass	Closed Cooling Water (Internal)	None	None			G, 6
			Indoor Air (External)	None	None	VII.J-10 (AP-14)	3.3.1-75	A
			Lubricating Oil (Internal)	None	None	VII.J-12 (AP-15)	3.3.1-75	A
Strainer	Filter	Stainless Steel	Fuel Oil (External)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-6 (AP-54)	3.3.1-54	B
			Lubricating Oil (External)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.H2-17 (AP-59)	3.3.1-27	E
					One-Time Inspection (B.1.24)	VII.H2-17 (AP-59)	3.3.1-27	E
Strainer Body	Pressure Boundary	Aluminum	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-1 (AP-35)	3.3.1-25	B

Table 3.3.2.1.13 Emergency Diesel Generator and Auxiliary System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Strainer Body	Pressure Boundary	Aluminum	Fuel Oil (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.H1-1 (AP-35)	3.3.1-25	A
			Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	A
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)			G, 2
					One-Time Inspection (B.1.24)			G, 2
		Carbon and low alloy steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-10 (A-30)	3.3.1-20	B
					One-Time Inspection (B.1.24)	VII.H1-10 (A-30)	3.3.1-20	A
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.H2-20 (AP-30)	3.3.1-16	E
					One-Time Inspection (B.1.24)	VII.H2-20 (AP-30)	3.3.1-16	E
Tanks (Fuel Day Tank)	Pressure Boundary	Carbon and low alloy steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-10 (A-30)	3.3.1-20	B, 10

Table 3.3.2.1.13 Emergency Diesel Generator and Auxiliary System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Tanks (Fuel Day Tank)	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Tanks (Fuel Oil Tank)	Pressure Boundary	Carbon and low alloy steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-10 (A-30)	3.3.1-20	B, 10
			Outdoor Air (External)	Loss of Material	Aboveground Outdoor Tanks (B.1.21)	VII.H1-11 (A-95)	3.3.1-33	B
Tanks (Immersion Heater)	Pressure Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.H2-24 (A-25)	3.3.1-42	B
					One-Time Inspection (B.1.24)	VII.H2-24 (A-25)	3.3.1-42	E,3
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Tanks (Water Tank)	Pressure Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.H2-24 (A-25)	3.3.1-42	B
					One-Time Inspection (B.1.24)	VII.H2-24 (A-25)	3.3.1-42	E, 3
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Temperature Control Manifold (Water Cooling)	Pressure Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.H2-24 (A-25)	3.3.1-42	B

Table 3.3.2.1.13 Emergency Diesel Generator and Auxiliary System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Temperature Control Manifold (Water Cooling)	Pressure Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.H2-24 (A-25)	3.3.1-42	E, 3
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Thermowell	Pressure Boundary	Brass	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.H2-8 (AP-12)	3.3.1-38	B
					Selective Leaching of Materials (B.1.25)	VII.H2-12 (AP-43)	3.3.1-65	A
			Indoor Air (External)	None	None	VIII.I-2 (SP-6)	3.4.1-32	A
Valve Body	Leakage Boundary	Carbon and low alloy steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-10 (A-30)	3.3.1-20	B
					One-Time Inspection (B.1.24)	VII.H1-10 (A-30)	3.3.1-20	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.H1-8 (A-24)	3.3.1-16	E
	Pressure Boundary	Aluminum	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-1 (AP-35)	3.3.1-25	B
					One-Time Inspection (B.1.24)	VII.H1-1 (AP-35)	3.3.1-25	A

Table 3.3.2.1.13 Emergency Diesel Generator and Auxiliary System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Aluminum	Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	A
		Brass	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.H2-8 (AP-12)	3.3.1-38	B
					Selective Leaching of Materials (B.1.25)	VII.H2-12 (AP-43)	3.3.1-65	A
			Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-3 (AP-44)	3.3.1-26	B, 8
					One-Time Inspection (B.1.24)	VII.H1-3 (AP-44)	3.3.1-26	A, 8
			Indoor Air (External)	None	None	VIII.I-2 (SP-6)	3.4.1-32	A
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.H2-10 (AP-47)	3.3.1-24	E
					One-Time Inspection (B.1.24)	VII.H2-10 (AP-47)	3.3.1-24	E
		Carbon and low alloy steel	Condensation (Internal)	Loss of Material	Periodic Inspection Program (B.2.5)	VII.F4-3 (A-13)	3.3.1-19	E
			Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-10 (A-30)	3.3.1-20	B

Table 3.3.2.1.13 Emergency Diesel Generator and Auxiliary System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Carbon and low alloy steel	Fuel Oil (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.H1-10 (A-30)	3.3.1-20	A
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.H2-20 (AP-30)	3.3.1-16	E
					One-Time Inspection (B.1.24)	VII.H2-20 (AP-30)	3.3.1-16	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.H1-8 (A-24)	3.3.1-16	E
		Stainless Steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-9 (A-52)	3.3.1-39	B
			Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-6 (AP-54)	3.3.1-54	B
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Indoor Air (Internal)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.H2-17 (AP-59)	3.3.1-27	E

Table 3.3.2.1.13 Emergency Diesel Generator and Auxiliary System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.H2-17 (AP-59)	3.3.1-27	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The aging effects for carbon steel closure bolting in an outdoor environment also includes loss of preload.
2. The aging effect for aluminum with a lubricating oil (internal) environment is based on industry standards (EPRI Mechanical Tools, Report Number 1003056, Appendix C) and assumes the potential for water pooling/separation in aluminum components.
3. The One-Time Inspection program confirms the absence of aging effects in stagnant flow areas.
4. The One-Time Inspection is applied to the carbon steel and brass drain piping with a raw water environment.
5. Reusable steel filter element subjected to an oil bath.
6. There is no aging effect for glass in the component cooling water environment. This is consistent with industry standards and NUREG 1801 line items for treated water VII.J-15 (AP-51) and raw water VII.J-13 (AP-50).
7. Aging effects on heat transfer function are based on industry standards (EPRI Mechanical Tools,Report Number 1003056, Appendiix G). Fouling is not a significant aging mechanism for brass tubes with closed cooling water environment.
8. Aging effect of loss of material is applied to copper alloy with a fuel oil environment. Presence of water is not assumed and confirmed by the Fuel Oil Chemistry program.
9. The aging effects for stainless steel closure bolting in an outdoor air (external) environment include loss of material and loss of preload. The aging effect for stainless steel closure bolting in an indoor environment includes loss of preload.

10. The fuel oil tanks are subject to internal inspections as part of the Fuel Oil Chemistry program, and therefore application of the One-Time Inspection program for this component is not necessary.

Table 3.3.2.1.14
Emergency Service Water System
Summary of Aging Management Evaluation

Table 3.3.2.1.14 Emergency Service Water System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
		Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
			Outdoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-1 (AP-28)	3.3.1-36	B
				Loss Of Preload	Bolting Integrity (B.1.12)			H, 6
			Raw Water – Salt Water (External)	Loss of Material	Bolting Integrity (B.1.12)			G, 8
				Loss Of Preload	Bolting Integrity (B.1.12)			G, 8

Table 3.3.2.1.14 Emergency Service Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Soil (External)	Loss of Material	Bolting Integrity (B.1.12)			G, 5
				Loss Of Preload	Bolting Integrity (B.1.12)			G, 5
		Stainless Steel	Indoor Air (External)	Loss Of Preload	Bolting Integrity (B.1.12)			G, 1
			Outdoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)			G, 10
				Loss Of Preload	Bolting Integrity (B.1.12)			G, 10
Expansion Joint	Pressure Boundary	Elastomer	Outdoor Air (External)	Change in Material Properties	Structures Monitoring Program (B.1.31)	VII.G-2 (A-20)	3.3.1-46	E, 7
			Raw Water – Salt Water (Internal)	Change in Material Properties	Periodic Inspection Program (B.2.5)			G, 3
Flow Element	Pressure Boundary	Nickel Alloy	Indoor Air (External)	None	None	VII.J-16 (AP-16)	3.3.1-76	A
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-13 (AP-53)	3.3.1-61	A
Heat Exchangers (Containment Spray)	Heat Transfer	Titanium (Tubes)	Raw Water – Salt Water (Internal)	Reduction of Heat Transfer	Open-Cycle Cooling Water System (B.1.13)			F, 2

Table 3.3.2.1.14 Emergency Service Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchangers (Containment Spray)	Heat Transfer	Titanium (Tubes)	Treated Water (External)	Reduction of Heat Transfer	Water Chemistry (B.1.2)			F, 2
	Pressure Boundary	Aluminum Bronze (tubesheet)	Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-7 (A-44)	3.3.1-57	C
					Selective Leaching of Materials (B.1.25)	VII.C1-8 (A-47)	3.3.1-65	C
			Treated Water (External)	Loss of Material	Selective Leaching of Materials (B.1.25)	VII.C2-6 (AP-32)	3.3.1-65	C
		Carbon and low alloy steel (Shell Side Components)	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.E-3 (S-18)	3.4.1-2	A
					Water Chemistry (B.1.2)	VIII.E-3 (S-18)	3.4.1-2	B
		Copper Alloy (Tube Side Components)	Indoor Air (External)	None	None	VIII.I-2 (SP-6)	3.4.1-32	C

Table 3.3.2.1.14 Emergency Service Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchangers (Containment Spray)	Pressure Boundary	Copper Alloy (Tube Side Components)	Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-7 (A-44)	3.3.1-57	C
					Selective Leaching of Materials (B.1.25)	VII.C1-8 (A-47)	3.3.1-65	C
		Titanium (Tubes)	Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)			F, 2
			Treated Water (External)	Loss of Material	Water Chemistry (B.1.2)			F, 2
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-18 (A-32)	3.3.1-63	A
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A
	Pressure Boundary	Brass	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)			G, 4

Table 3.3.2.1.14 Emergency Service Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Brass	Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-7 (A-44)	3.3.1-57	A
					Selective Leaching of Materials (B.1.25)	VII.C1-8 (A-47)	3.3.1-65	A
		Bronze	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-7 (A-44)	3.3.1-57	A
					Selective Leaching of Materials (B.1.25)	VII.C1-8 (A-47)	3.3.1-65	A
		Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-8 (A-78)	3.3.1-12	E
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-18 (A-32)	3.3.1-63	A
		Carbon and low alloy steel (w/coating or wrapping)	Soil (External)	Loss of Material	Buried Piping Inspection (B.1.26)	VII.C1-19 (A-01)	3.3.1-18	B, 9
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Table 3.3.2.1.14 Emergency Service Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A
Pump Casing (ESW Pumps)	Pressure Boundary	Stainless Steel	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
			Raw Water – Salt Water	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A
Pump Casing (HTXR Drain Pumps)	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A
Restricting Orifice	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A
	Throttle	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A

Table 3.3.2.1.14 Emergency Service Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Sight Glasses	Pressure Boundary	Bronze (Body)	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-7 (A-44)	3.3.1-57	A
					Selective Leaching of Materials (B.1.25)	VII.C1-8 (A-47)	3.3.1-65	A
		Glass (Window)	Indoor Air (External)	None	None	V.F-8 (EP-15)	3.2.1-33	A
			Raw Water – Salt Water (Internal)	None	None	V.F-10 (EP-28)	3.2.1-33	A
Thermowell	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-18 (A-32)	3.3.1-63	A
Valve Body	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-18 (A-32)	3.3.1-63	A
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Table 3.3.2.1.14 Emergency Service Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Leakage Boundary	Stainless Steel	Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A
	Pressure Boundary	Brass	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)			G, 4
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-7 (A-44)	3.3.1-57	A
					Selective Leaching of Materials (B.1.25)	VII.C1-8 (A-47)	3.3.1-65	A
		Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-8 (A-78)	3.3.1-12	E
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-18 (A-32)	3.3.1-63	A
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The aging effect for stainless steel closure bolting in an indoor air (external) environment is loss of preload.
2. Titanium is not addressed in NUREG-1801. Aging effects are based on industry standards (EPRI Mechanical Tools Appendices B, E, and G).
3. The Structures Monitoring Program includes external surface inspections but does not include internal surface inspections. The Periodic Inspection Program will inspect this component for internal aging effects.
4. The environment for copper alloy (brass/bronze/copper) in an outdoor air (external) environment is loss of material based on industry standards (EPRI Mechanical Tools Appendices E).
5. The aging effects for closure bolting in a buried (soil) external environment include loss of material and loss of preload. External inspections of buried bolting will occur in accordance with the frequency outlined in the Buried Piping Inspection program.
6. The aging effects for carbon and alloy steel closure bolting in an outdoor air (external) environment also include loss of preload.
7. Change in material properties will be detected by the Structures Monitoring Program external surfaces inspections.
8. The aging effects for carbon and alloy steel closure bolting in a raw water - salt water (external) environment include loss of material and loss of preload.
9. Exterior coating or wrapping is applied to all carbon steel piping and fittings that are exposed to a soil (external) environment.
10. The aging effects for stainless steel closure bolting in an outdoor air (external) environment include loss of material and loss of preload.

Table 3.3.2.1.15
Fire Protection System
Summary of Aging Management Evaluation

Table 3.3.2.1.15 Fire Protection System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
			Outdoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-1 (AP-28)	3.3.1-36	B
				Loss Of Preload	Bolting Integrity (B.1.12)			H, 1
			Soil (External)	Loss of Material	Bolting Integrity (B.1.12)			G, 7
				Loss Of Preload	Bolting Integrity (B.1.12)			G, 7
		Stainless Steel	Indoor Air (External)	Loss Of Preload	Bolting Integrity (B.1.12)			G
			Raw Water – Fresh Water (External)	Loss of Material	Bolting Integrity (B.1.12)			G

Table 3.3.2.1.15 Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Stainless Steel	Raw Water – Fresh Water (External)	Loss Of Preload	Bolting Integrity (B.1.12)			G
Dikes	Fire Barrier (Contain oil spill)	Carbon and low alloy steel	Outdoor Air	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-8 (A-78)	3.3.1-12	E
Expansion Joint	Pressure Boundary	Elastomer	Indoor Air (External)	Change in Material Properties	Structures Monitoring Program (B.1.31)	VII.F3-7 (A-36)	3.3.1-10	E
			Raw Water – Fresh Water (Internal)	Change in Material Properties	Periodic Inspection Program (B.2.5)			G
Fire Barrier Penetration Seals	Fire Barrier	Elastomer	Indoor Air	Change in Material Properties	Fire Protection (B.1.19)	VII.G-1 (A-19)	3.3.1-46	B
		Grout	Indoor Air	Cracking	Fire Protection (B.1.19)			F
Fire Barrier Walls and Slabs	Fire Barrier	Concrete	Indoor Air	Cracking	Fire Protection (B.1.19)	VII.G-25 (A-90)	3.3.1-49	B
					Structures Monitoring Program (B.1.31)	VII.G-25 (A-90)	3.3.1-49	A
				Loss of Material	Fire Protection (B.1.19)	VII.G-26 (A-91)	3.3.1-50	B
					Structures Monitoring Program (B.1.31)	VII.G-26 (A-91)	3.3.1-50	A

Table 3.3.2.1.15 Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Fire Barrier Walls and Slabs	Fire Barrier	Concrete	Outdoor Air	Change in Material Properties	Fire Protection (B.1.19)			H, 2
					Structures Monitoring Program (B.1.31)			H, 2
				Cracking	Fire Protection (B.1.19)	VII.G-27 (A-92)	3.3.1-49	B
					Structures Monitoring Program (B.1.31)	VII.G-27 (A-92)	3.3.1-49	A
				Loss of Material	Fire Protection (B.1.19)	VII.G-28 (A-93)	3.3.1-50	B
					Structures Monitoring Program (B.1.31)	VII.G-28 (A-93)	3.3.1-50	A
		Gypsum board	Indoor Air	None	None			F
Fire Doors	Fire Barrier	Carbon and low alloy steel	Indoor Air	Loss of Material	Fire Protection (B.1.19)	VII.G-3 (A-21)	3.3.1-47	B
			Outdoor Air	Loss of Material	Fire Protection (B.1.19)	VII.G-4 (A-22)	3.3.1-47	B
Fire hydrant	Pressure Boundary	Cast Iron	Outdoor Air (External)	Loss of Material	Fire Water System (B.1.20)	VII.I-8 (A-78)	3.3.1-12	E

Table 3.3.2.1.15 Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Fire hydrant	Pressure Boundary	Cast Iron	Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-21 (A-33)	3.3.1-53	A
					Selective Leaching of Materials (B.1.25)	VII.G-14 (AP-29)	3.3.1-67	A
			Soil (External)	Loss of Material	Buried Piping Inspection (B.1.26)	VII.G-22 (A-01)	3.3.1-18	B
					Selective Leaching of Materials (B.1.25)	VII.G-12 (A-02)	3.3.1-66	A
Fire Rated Enclosures	Fire Barrier	Alumina Silica	Indoor Air	Change in Material Properties	Fire Protection (B.1.19)			F
				Cracking	Fire Protection (B.1.19)			F
		Elastomer	Indoor Air	Change in Material Properties	Fire Protection (B.1.19)	VII.G-1 (A-19)	3.3.1-46	D
		Mecatiss	Indoor Air	Change in Material Properties	Fire Protection (B.1.19)			F
		Pyrocrete	Indoor Air (External)	Cracking	Fire Protection (B.1.19)			F
				Loss of Material	Fire Protection (B.1.19)			F

Table 3.3.2.1.15 Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Fire Rated Enclosures	Fire Barrier	Thermo-Lag	Indoor Air (External)	Cracking	Fire Protection (B.1.19)			F
				Loss of Material	Fire Protection (B.1.19)			F
Flexible Hose	Pressure Boundary	Copper	Dry Gas (Internal)	None	None	VII.J-5 (AP-9)	3.3.1-79	A
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-9 (A-45)	3.3.1-51	A
		Elastomer	Fuel Oil (Internal)	Change in Material Properties	Periodic Inspection Program (B.2.5)			G
			Indoor Air (External)	Change in Material Properties	Structures Monitoring Program (B.1.31)	VII.F2-7 (A-36)	3.3.1-10	E
		Polyethylene (teflon)	Dry Gas (Internal)	None	None			F
			Indoor Air (External)	None	None			F
		Stainless Steel	Dry Gas (Internal)	None	None	VII.J-21 (AP-22)	3.3.1-79	A

Table 3.3.2.1.15 Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flexible Hose	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-17 (A-55)	3.3.1-52	A
Flow Element (Annubar)	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Fire Water System (B.1.20)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-21 (A-33)	3.3.1-53	A
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-17 (A-55)	3.3.1-52	A
Gas Bottles (CO2, Halon Storage Cylinders)	Pressure Boundary	Carbon and low alloy steel	Dry Gas (Internal)	None	None	VII.J-26 (AP-6)	3.3.1-79	A
			Indoor Air (External)	Loss of Material	Fire Protection (B.1.19)	VII.I-7 (A-77)	3.3.1-12	E
Gauge Snubber	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Table 3.3.2.1.15 Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Gauge Snubber	Pressure Boundary	Stainless Steel	Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-17 (A-55)	3.3.1-52	A
Gear Box	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Fire Water System (B.1.20)	VII.I-7 (A-77)	3.3.1-12	E
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.G-20 (AP-30)	3.3.1-16	E
					One-Time Inspection (B.1.24)	VII.G-20 (AP-30)	3.3.1-16	E
Heat Exchangers	Heat Transfer	Copper Alloy (Tubes)	Lubricating Oil (Internal)	Reduction of Heat Transfer	Lubricating Oil Monitoring Activities (B.2.2)			G
			Raw Water – Fresh Water (External)	Reduction of Heat Transfer	Fire Water System (B.1.20)	VII.C1-4 (A-72)	3.3.1-60	E, 4
	Pressure Boundary	Copper Alloy (Shell)	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	C
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.C1-1 (A-65)	3.3.1-57	E, 4
		Copper Alloy (Tubes)	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.C1-6 (AP-47)	3.3.1-24	E
					One-Time Inspection (B.1.24)	VII.C1-6 (AP-47)	3.3.1-24	E

Table 3.3.2.1.15 Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchangers	Pressure Boundary	Copper Alloy (Tubes)	Raw Water – Fresh Water (External)	Loss of Material	Fire Water System (B.1.20)	VII.C1-1 (A-65)	3.3.1-57	E, 4
Hose Manifold	Pressure Boundary	Carbon and low alloy steel	Outdoor Air (External)	Loss of Material	Fire Water System (B.1.20)	VII.I-8 (A-78)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-21 (A-33)	3.3.1-53	A
Odorizer	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Fire Protection (B.1.19)	VII.I-7 (A-77)	3.3.1-12	E
			Indoor Air (Internal)	Loss of Material	Fire Protection (B.1.19)	VII.I-7 (A-77)	3.3.1-12	E
Piping and fittings	Pressure Boundary	Brass	Dry Gas (Internal)	None	None	VII.J-5 (AP-9)	3.3.1-79	A
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Indoor Air (Internal)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-9 (A-45)	3.3.1-51	A
					Selective Leaching of Materials (B.1.25)	VII.G-10 (A-47)	3.3.1-65	A

Table 3.3.2.1.15 Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Carbon and low alloy steel	Dry Gas (Internal)	None	None	VII.J-26 (AP-6)	3.3.1-79	A
			Fuel Oil (Internal)	Loss of Material	Fire Protection (B.1.19)	VII.G-19 (A-28)	3.3.1-48	B
					Fuel Oil Chemistry (B.1.22)	VII.G-19 (A-28)	3.3.1-48	B
			Indoor Air (External)	Loss of Material	Fire Protection (B.1.19)	VII.I-7 (A-77)	3.3.1-12	E
					Fire Water System (B.1.20)	VII.I-7 (A-77)	3.3.1-12	E
			Indoor Air (Internal)	Loss of Material	Fire Protection (B.1.19)	VII.F3-6 (A-11)	3.3.1-16	E
					Fire Water System (B.1.20)	VII.F3-6 (A-11)	3.3.1-16	E
			Outdoor Air (External)	Loss of Material	Fire Protection (B.1.19)	VII.I-8 (A-78)	3.3.1-12	E
					Fire Water System (B.1.20)	VII.I-8 (A-78)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-21 (A-33)	3.3.1-53	A

Table 3.3.2.1.15 Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Carbon and low alloy steel	Soil (External)	Loss of Material	Buried Piping Inspection (B.1.26)	VII.G-22 (A-01)	3.3.1-18	B
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-17 (A-55)	3.3.1-52	A
Pump Casing (Redundant Fire Pump)	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Fire Water System (B.1.20)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-21 (A-33)	3.3.1-53	A
Pump Casing (Vertical Turbine)	Pressure Boundary	Bronze (bowls)	Raw Water – Fresh Water (External)	Loss of Material	Fire Water System (B.1.20)	VII.G-9 (A-45)	3.3.1-51	A
					Selective Leaching of Materials (B.1.25)	VII.G-10 (A-47)	3.3.1-65	A
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-9 (A-45)	3.3.1-51	A
					Selective Leaching of Materials (B.1.25)	VII.G-10 (A-47)	3.3.1-65	A
		Carbon and low alloy steel (column pipe)	Outdoor Air (External)	Loss of Material	Fire Water System (B.1.20)	VII.I-8 (A-78)	3.3.1-12	E

Table 3.3.2.1.15 Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pump Casing (Vertical Turbine)	Pressure Boundary	Carbon and low alloy steel (column pipe)	Raw Water – Fresh Water (External)	Loss of Material	Fire Water System (B.1.20)	VII.G-21 (A-33)	3.3.1-53	A
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-21 (A-33)	3.3.1-53	A
		Cast Iron (discharge head)	Indoor Air (External)	Loss of Material	Fire Water System (B.1.20)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-21 (A-33)	3.3.1-53	A
					Selective Leaching of Materials (B.1.25)	VII.G-14 (AP-29)	3.3.1-67	A
Restricting Orifice	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Fire Water System (B.1.20)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-21 (A-33)	3.3.1-53	A
	Throttle	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Fire Water System (B.1.20)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-21 (A-33)	3.3.1-53	A
Spray Nozzle (CO2, Halon)	Spray	Brass	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A

Table 3.3.2.1.15 Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Spray Nozzle (CO2, Halon)	Spray	Brass	Indoor Air (Internal)	None	None	V.F-4 (EP-10)	3.2.1-35	A
		Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Fire Protection (B.1.19)	VII.I-7 (A-77)	3.3.1-12	E
			Indoor Air (Internal)	Loss of Material	Fire Protection (B.1.19)	VII.F3-6 (A-11)	3.3.1-16	E
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Indoor Air (Internal)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Sprinkler Heads	Pressure Boundary	Brass	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Indoor Air (Internal)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Outdoor Air (External)	Loss of Material	Fire Water System (B.1.20)			G
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-9 (A-45)	3.3.1-51	A
					Selective Leaching of Materials (B.1.25)	VII.G-10 (A-47)	3.3.1-65	A

Table 3.3.2.1.15 Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Sprinkler Heads	Spray	Brass	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Indoor Air (Internal)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Outdoor Air (External)	Loss of Material	Fire Water System (B.1.20)			G
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-9 (A-45)	3.3.1-51	A
					Selective Leaching of Materials (B.1.25)	VII.G-10 (A-47)	3.3.1-65	A
Strainer	Filter	Stainless Steel	Raw Water – Fresh Water (External)	Loss of Material	Fire Water System (B.1.20)	VII.G-17 (A-55)	3.3.1-52	A
Strainer Body	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Fire Water System (B.1.20)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-21 (A-33)	3.3.1-53	A
		Cast Iron	Indoor Air (External)	Loss of Material	Fire Water System (B.1.20)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-21 (A-33)	3.3.1-53	A

Table 3.3.2.1.15 Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Strainer Body	Pressure Boundary	Cast Iron	Raw Water – Fresh Water (Internal)	Loss of Material	Selective Leaching of Materials (B.1.25)	VII.G-14 (AP-29)	3.3.1-67	A
Tank Heater	Pressure Boundary	Stainless Steel	Outdoor Air (External)	Loss of Material	Aboveground Outdoor Tanks (B.1.21)	VII.F3-4 (A-09)	3.3.1-23	E, 3
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-17 (A-55)	3.3.1-52	A
Tanks (CO2)	Pressure Boundary	Carbon and low alloy steel	Dry Gas (Internal)	None	None	VII.J-26 (AP-6)	3.3.1-79	A
			Outdoor Air (External)	Loss of Material	Aboveground Outdoor Tanks (B.1.21)	VII.H1-11 (A-95)	3.3.1-33	B
Tanks (Fuel Oil)	Pressure Boundary	Carbon and low alloy steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-10 (A-30)	3.3.1-20	D, 6
			Outdoor Air (External)	Loss of Material	Aboveground Outdoor Tanks (B.1.21)	VII.H1-11 (A-95)	3.3.1-33	B
Tanks (Retarding Chamber)	Pressure Boundary	Cast Iron	Indoor Air (External)	Loss of Material	Fire Water System (B.1.20)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-21 (A-33)	3.3.1-53	A
					Selective Leaching of Materials (B.1.25)	VII.G-14 (AP-29)	3.3.1-67	A

Table 3.3.2.1.15 Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Tanks (Water Storage)	Pressure Boundary	Carbon and low alloy steel	Outdoor Air (External)	Loss of Material	Aboveground Outdoor Tanks (B.1.21)	VII.H1-11 (A-95)	3.3.1-33	B
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-21 (A-33)	3.3.1-53	A
			Soil (External) (Tank bottom surface)	Loss of Material	Aboveground Outdoor Tanks (B.1.21)	VII.G-22 (A-01)	3.3.1-18	E, 5
Thermowell	Pressure Boundary	Carbon and low alloy steel	Outdoor Air (External)	Loss of Material	Fire Water System (B.1.20)	VII.I-8 (A-78)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-21 (A-33)	3.3.1-53	A
Valve Body	Pressure Boundary	Brass	Dry Gas (Internal)	None	None	VII.J-5 (AP-9)	3.3.1-79	A
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Outdoor Air (External)	Loss of Material	Fire Water System (B.1.20)			G
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-9 (A-45)	3.3.1-51	A
					Selective Leaching of Materials (B.1.25)	VII.G-10 (A-47)	3.3.1-65	A

Table 3.3.2.1.15 Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Bronze	Dry Gas (Internal)	None	None	VII.J-5 (AP-9)	3.3.1-79	A
			Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.G-8 (AP-44)	3.3.1-26	B
					One-Time Inspection (B.1.24)	VII.G-8 (AP-44)	3.3.1-26	A
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Outdoor Air (External)	Loss of Material	Fire Water System (B.1.20)			G
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-9 (A-45)	3.3.1-51	A
					Selective Leaching of Materials (B.1.25)	VII.G-10 (A-47)	3.3.1-65	A
		Carbon and low alloy steel	Dry Gas (Internal)	None	None	VII.J-26 (AP-6)	3.3.1-79	A
			Fuel Oil (Internal)	Loss of Material	Fire Protection (B.1.19)	VII.G-19 (A-28)	3.3.1-48	B
					Fuel Oil Chemistry (B.1.22)	VII.G-19 (A-28)	3.3.1-48	B

Table 3.3.2.1.15 Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Fire Protection (B.1.19)	VII.I-7 (A-77)	3.3.1-12	E
					Fire Water System (B.1.20)	VII.I-7 (A-77)	3.3.1-12	E
			Outdoor Air (External)	Loss of Material	Fire Protection (B.1.19)	VII.I-8 (A-78)	3.3.1-12	E
					Fire Water System (B.1.20)	VII.I-8 (A-78)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-21 (A-33)	3.3.1-53	A
			Soil (External)	Loss of Material	Buried Piping Inspection (B.1.26)	VII.G-22 (A-01)	3.3.1-18	B
		Cast Iron	Indoor Air (External)	Loss of Material	Fire Water System (B.1.20)	VII.I-7 (A-77)	3.3.1-12	E
			Outdoor Air (External)	Loss of Material	Fire Water System (B.1.20)	VII.I-8 (A-78)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-21 (A-33)	3.3.1-53	A
					Selective Leaching of Materials (B.1.25)	VII.G-14 (AP-29)	3.3.1-67	A

Table 3.3.2.1.15 Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Cast Iron	Soil (External)	Loss of Material	Buried Piping Inspection (B.1.26)	VII.G-22 (A-01)	3.3.1-18	B
					Selective Leaching of Materials (B.1.25)	VII.G-12 (A-02)	3.3.1-66	A
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-17 (A-55)	3.3.1-52	A
Water Motor Alarm	Pressure Boundary	Aluminum	Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	A
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)			G
		Cast Iron	Indoor Air (External)	Loss of Material	Fire Water System (B.1.20)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	Fire Water System (B.1.20)	VII.G-21 (A-33)	3.3.1-53	A
				Loss of Material	Selective Leaching of Materials (B.1.25)	VII.G-14 (AP-29)	3.3.1-67	A

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. Aging effect is not addressed for this component, material and environment in NUREG-1801, but the identified aging management program is also appropriate for this aging effect.
2. Aging management programs recommended by NUREG-1801 item VII.G-27 (A-92) are also applicable for this aging effect.
3. The environment for stainless steel in outdoor air (external) includes condensation.
4. The Fire Water System aging management program is applicable to this fire protection system heat exchanger, as opposed to the Open-Cycle Cooling Water System program recommended by NUREG-1801 items VII.C1-1 (A-65) and VII.C1-4 (A-72).
5. Bottom surface of tank is exposed to soil environment, but this surface is not subject to inspection by NUREG-1801 recommended program. Tank bottom is addressed by Above Ground Outdoor Tanks program.
6. The fuel oil tank is subject to internal inspections as part of the Fuel Oil Chemistry program, and therefore application of the One-Time Inspection program for this component is not necessary.
7. The aging effects of carbon and alloy steel closure bolting in a soil (external) environment is loss of material and loss of preload. External inspections of buried bolting will occur in accordance with the frequency outlined in the Buried Piping Inspection program.

Table 3.3.2.1.16
Fuel Storage and Handling Equipment
Summary of Aging Management Evaluation

Table 3.3.2.1.16 Fuel Storage and Handling Equipment

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Cask Drop Protection Cylindrical Structure	Structural Support	Stainless Steel	Treated Water < 140F	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-11 (A-58)	3.3.1-22	C
					Water Chemistry (B.1.2)	VII.A4-11 (A-58)	3.3.1-22	D
Fuel Grapple/Mast	Structural Support	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	C
			Treated Water < 140F (External)	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-11 (A-58)	3.3.1-22	C
					Water Chemistry (B.1.2)	VII.A4-11 (A-58)	3.3.1-22	D
Fuel Preparation Machine	Structural Support	Aluminum	Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	C
			Treated Water < 140F (External)	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-5 (AP-38)	3.3.1-15	C
					Water Chemistry (B.1.2)	VII.A4-5 (AP-38)	3.3.1-15	D

Table 3.3.2.1.16 Fuel Storage and Handling Equipment (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Fuel Preparation Machine	Structural Support	Stainless Steel	Treated Water < 140F (External)	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-11 (A-58)	3.3.1-22	C
					Water Chemistry (B.1.2)	VII.A4-11 (A-58)	3.3.1-22	D
New Fuel Storage Racks	Structural Support	Aluminum	Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	C
Refueling platform	Structural Support	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.1.16)	VII.A1-1 (A-94)	3.3.1-68	E, 1
Spent Fuel Storage Racks	Absorb Neutrons	Boraflex	Treated Water < 140F	Reduction of Neutron-Absorbing Capacity	Boraflex Rack Management Program (B.1.15)	VII.A2-1 (A-87)	3.3.1-30	B
		Boral	Treated Water < 140F	None	None	VII.A2-2 (A-89)	3.3.1-29	I, 2
	Structural Support	Stainless Steel	Treated Water < 140F (External)	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-11 (A-58)	3.3.1-22	C
					Water Chemistry (B.1.2)	VII.A4-11 (A-58)	3.3.1-22	D
Structural Bolts	Structural Support	Carbon and low alloy steel	Indoor Air	Loss of Material	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.1.16)	VII.I-4 (AP-27)	3.3.1-35	E, 1

Table 3.3.2.1.16 Fuel Storage and Handling Equipment (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Structural Bolts	Structural Support	Carbon and low alloy steel	Indoor Air	Loss Of Preload	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.1.16)	VII.I-5 (AP-26)	3.3.1-35	E, 1

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1.The Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems program is the applicable Aging Management program for the component instead of the Structures Monitoring Program.

2. Based on past precedence (NUREG-1787, VC Summer SER, paragraph 3.5.2.4.2), the Staff concluded that Boral aging effects are insignificant and require no aging management. The staff noted that the potential aging effects resulting from sustained irradiation of Boral were previously evaluated by staff (BNL-NUREG-25582, dated January 1979) and determined to be insignificant. Oyster Creek installed four (4) spent fuel storage racks, manufactured by HOLTEC International, that utilized Boral neutron absorbing material, in year 2000. The Boral coupons kept inside the spent fuel storage pool were removed and inspected in 2002, and again in 2004. Inspection results showed no blisters, pits, dimensional changes, or other age related degradations. Neutron transmission tests on the irradiated coupon showed that average Boron-10 areal density in the irradiated coupon is 0.0209 grams/cm2, which means, within the experimental accuracy, Boron-10 has not been lost from the coupons. Plant operating experience is therefore consistent with the staff's conclusion as documented in NUREG-1787 and an aging management program is not required.

Table 3.3.2.1.17
Hardened Vent System
Summary of Aging Management Evaluation

Table 3.3.2.1.17 Hardened Vent System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Outdoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-1 (AP-28)	3.3.1-36	B
				Loss Of Preload	Bolting Integrity (B.1.12)			H, 1
		Carbon and low alloy steel	Outdoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-1 (AP-28)	3.3.1-36	B
				Loss Of Preload	Bolting Integrity (B.1.12)			H, 1
		Stainless Steel	Outdoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)			G, 2
				Loss Of Preload	Bolting Integrity (B.1.12)			G, 2
Enclosure Boot	Pressure Boundary	Elastomer	Indoor Air (Internal)	Change in Material Properties	Structures Monitoring Program (B.1.31)	VII.G-1 (A-19)	3.3.1-46	E, 3
			Outdoor Air (External)	Change in Material Properties	Structures Monitoring Program (B.1.31)	VII.G-2 (A-20)	3.3.1-46	E, 3

Table 3.3.2.1.17 Hardened Vent System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Carbon and low alloy steel	Indoor Air (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.F3-6 (A-11)	3.3.1-16	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-8 (A-78)	3.3.1-12	E
Valve Body	Pressure Boundary	Carbon and low alloy steel	Indoor Air (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.F3-6 (A-11)	3.3.1-16	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-8 (A-78)	3.3.1-12	E

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The aging effects for carbon and alloy steel closure bolting in an outdoor air (external) environment also include loss of preload.
2. The aging effects for stainless steel closure bolting in an outdoor air (external) environment include loss of material and loss of preload.
3. Change in material properties will be detected by the Structural Monitoring Program external inspections. Internal inspections will not be performed since the aging effects of the internal environment are bounded by the external environment aging effects.

Table 3.3.2.1.18
Heating & Process Steam System
Summary of Aging Management Evaluation

Table 3.3.2.1.18 Heating & Process Steam System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VIII.H-4 (S-34)	3.4.1-27	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VIII.H-5 (S-33)	3.4.1-27	B
			Outdoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VIII.H-1 (S-32)	3.4.1-27	B
				Loss Of Preload	Bolting Integrity (B.1.12)			H, 1
		Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VIII.H-4 (S-34)	3.4.1-27	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VIII.H-5 (S-33)	3.4.1-27	B
			Outdoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VIII.H-1 (S-32)	3.4.1-27	B
				Loss Of Preload	Bolting Integrity (B.1.12)			H, 1

Table 3.3.2.1.18 Heating & Process Steam System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Coolers (Sample)	Leakage Boundary	Copper	Boiler Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.K-1 (AP-70)	3.3.1-23	E, 7, 11
					Water Chemistry (B.1.2)	VII.K-1 (AP-70)	3.3.1-23	E, 7, 11
			Indoor Air (External)	None	None	VIII.I-2 (SP-6)	3.4.1-32	A, 11
Flexible Connection	Leakage Boundary	Elastomer	Boiler Treated Water (Internal)	Change in Material Properties	Periodic Inspection Program (B.2.5)	VII.A4-1 (A-16)	3.3.1-11	E, 4
			Indoor Air (External)	Change in Material Properties	Structures Monitoring Program (B.1.31)	VII.F3-7 (A-36)	3.3.1-10	E
Flow Element	Leakage Boundary	Stainless Steel	Boiler Treated Water (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	VIII.E-25 (SP-19)	3.4.1-8	A
					Water Chemistry (B.1.2)	VIII.E-25 (SP-19)	3.4.1-8	B
				Loss of Material	One-Time Inspection (B.1.24)	VII.K-7 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.K-7 (AP-57)	3.3.1-23	E
			Indoor Air (External)	None	None	VIII.I-11 (SP-12)	3.4.1-32	A

Table 3.3.2.1.18 Heating & Process Steam System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchangers	Leakage Boundary	Copper	Auxiliary Steam (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.K-1 (AP-70)	3.3.1-23	E, 2, 6, 11
			Indoor Air (External)	None	None	VIII.I-2 (SP-6)	3.4.1-32	A, 11
			Outdoor Air (External)	Loss of Material	Periodic Inspection Program (B.2.5)			G, 3, 8, 11
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Auxiliary Steam (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-3 (S-04)	3.4.1-2	A
					Water Chemistry (B.1.2)	VIII.J-3 (S-04)	3.4.1-2	B, 9
			Boiler Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.E-27 (S-09)	3.4.1-2	A
					Water Chemistry (B.1.2)	VIII.E-27 (S-09)	3.4.1-2	B, 9
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VIII.H-7 (S-29)	3.4.1-5	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VIII.H-8 (S-41)	3.4.1-5	E
			Soil (External)	Loss of Material	Buried Piping Inspection (B.1.26)	VIII.E-1 (S-01)	3.4.1-7	B

Table 3.3.2.1.18 Heating & Process Steam System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Leakage Boundary	Stainless Steel	Auxiliary Steam (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	VIII.B2-1 (SP-45)	3.4.1-8	A
					Water Chemistry (B.1.2)	VIII.B2-1 (SP-45)	3.4.1-8	B
				Loss of Material	One-Time Inspection (B.1.24)	VIII.B2-2 (SP-46)	3.4.1-29	E, 5
					Water Chemistry (B.1.2)	VIII.B2-2 (SP-46)	3.4.1-29	B
			Boiler Treated Water (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	VIII.E-25 (SP-19)	3.4.1-8	A
					Water Chemistry (B.1.2)	VIII.E-25 (SP-19)	3.4.1-8	B
				Loss of Material	One-Time Inspection (B.1.24)	VII.K-7 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.K-7 (AP-57)	3.3.1-23	E
			Indoor Air (External)	None	None	VIII.I-11 (SP-12)	3.4.1-32	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C

Table 3.3.2.1.18 Heading & Process Steam System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Leakage Boundary	Stainless Steel	Soil (External)	Loss of Material	Buried Piping Inspection (B.1.26)	VIII.E-22 (SP-37)	3.4.1-11	E
Pump Casing - Chemical Addition Pump CH-P-11	Leakage Boundary	Stainless Steel	Boiler Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.K-7 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.K-7 (AP-57)	3.3.1-23	E
			Indoor Air (External)	None	None	VIII.I-11 (SP-12)	3.4.1-32	A
Pump Casing - Condensate Return Pumps P-13-1A/B, Chemical Feed Addition Pumps CH-P-6A/B, Boiler No. 1 Feed Pumps CH-P-4A/B, Boiler No. 2 Feed Pumps CH-P-3A/B, Deaerator Feed Pumps CH-P-5A/B, Chemical Recirc Pump CH-P-10	Leakage Boundary	Cast Iron	Boiler Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.E-27 (S-09)	3.4.1-2	A

Table 3.3.2.1.18 Heating & Process Steam System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pump Casing - Condensate Return Pumps P-13-1A/B, Chemical Feed Addition Pumps CH-P-6A/B, Boiler No. 1 Feed Pumps CH-P-4A/B, Boiler No. 2 Feed Pumps CH-P-3A/B, Deaerator Feed Pumps CH-P-5A/B, Chemical Recirc Pump CH-P-10	Leakage Boundary	Cast Iron	Boiler Treated Water (Internal)	Loss of Material	Selective Leaching of Materials (B.1.25)	VIII.E-18 (SP-27)	3.4.1-16	A
					Water Chemistry (B.1.2)	VIII.E-27 (S-09)	3.4.1-2	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VIII.H-7 (S-29)	3.4.1-5	E
Restricting Orifice	Leakage Boundary	Stainless Steel	Boiler Treated Water (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	VIII.E-25 (SP-19)	3.4.1-8	A
					Water Chemistry (B.1.2)	VIII.E-25 (SP-19)	3.4.1-8	B
				Loss of Material	One-Time Inspection (B.1.24)	VII.K-7 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.K-7 (AP-57)	3.3.1-23	E
			Indoor Air (External)	None	None	VIII.I-11 (SP-12)	3.4.1-32	A

Table 3.3.2.1.18 Heading & Process Steam System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Sight Glasses	Leakage Boundary	Carbon and low alloy steel	Boiler Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.E-27 (S-09)	3.4.1-2	A
					Water Chemistry (B.1.2)	VIII.E-27 (S-09)	3.4.1-2	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VIII.H-7 (S-29)	3.4.1-5	E
		Glass	Boiler Treated Water (Internal)	None	None	VIII.I-9 (SP-35)	3.4.1-31	A
			Indoor Air (External)	None	None	VIII.I-5 (SP-33)	3.4.1-31	A
Soot Blowers	Leakage Boundary	Carbon and low alloy steel	Auxiliary Steam (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-3 (S-04)	3.4.1-2	A
					Water Chemistry (B.1.2)	VIII.J-3 (S-04)	3.4.1-2	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VIII.H-7 (S-29)	3.4.1-5	E
Steam Trap	Leakage Boundary	Cast Iron	Auxiliary Steam (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-3 (S-04)	3.4.1-2	A
					Selective Leaching of Materials (B.1.25)	VIII.E-18 (SP-27)	3.4.1-16	A, 6

Table 3.3.2.1.18 Heating & Process Steam System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Steam Trap	Leakage Boundary	Cast Iron	Auxiliary Steam (Internal)	Loss of Material	Water Chemistry (B.1.2)	VIII.J-3 (S-04)	3.4.1-2	B
			Boiler Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.E-27 (S-09)	3.4.1-2	A
					Selective Leaching of Materials (B.1.25)	VIII.E-18 (SP-27)	3.4.1-16	A
					Water Chemistry (B.1.2)	VIII.E-27 (S-09)	3.4.1-2	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VIII.H-7 (S-29)	3.4.1-5	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VIII.H-8 (S-41)	3.4.1-5	E
		Copper Alloy	Auxiliary Steam (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.K-1 (AP-70)	3.3.1-23	E, 6
					Selective Leaching of Materials (B.1.25)	VII.K-6 (AP-32)	3.3.1-65	A, 6
			Boiler Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.K-1 (AP-70)	3.3.1-23	E
					Selective Leaching of Materials (B.1.25)	VII.K-6 (AP-32)	3.3.1-65	A

Table 3.3.2.1.18 Heating & Process Steam System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Steam Trap	Leakage Boundary	Copper Alloy	Indoor Air (External)	None	None	VIII.I-2 (SP-6)	3.4.1-32	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)			G, 3
Strainer Body	Leakage Boundary	Carbon and low alloy steel	Auxiliary Steam (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-3 (S-04)	3.4.1-2	A
					Water Chemistry (B.1.2)	VIII.J-3 (S-04)	3.4.1-2	B
			Boiler Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.E-27 (S-09)	3.4.1-2	A
					Water Chemistry (B.1.2)	VIII.E-27 (S-09)	3.4.1-2	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VIII.H-7 (S-29)	3.4.1-5	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VIII.H-8 (S-41)	3.4.1-5	E
		Cast Iron	Auxiliary Steam (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-3 (S-04)	3.4.1-2	A
					Selective Leaching of Materials (B.1.25)	VIII.E-18 (SP-27)	3.4.1-16	A, 6

Table 3.3.2.1.18 Heading & Process Steam System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Strainer Body	Leakage Boundary	Cast Iron	Auxiliary Steam (Internal)	Loss of Material	Water Chemistry (B.1.2)	VIII.J-3 (S-04)	3.4.1-2	B
			Boiler Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.E-27 (S-09)	3.4.1-2	A
					Selective Leaching of Materials (B.1.25)	VIII.E-18 (SP-27)	3.4.1-16	A
					Water Chemistry (B.1.2)	VIII.E-27 (S-09)	3.4.1-2	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VIII.H-7 (S-29)	3.4.1-5	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VIII.H-8 (S-41)	3.4.1-5	E
Tanks - Chemical Feed Addition Tanks CH-T-3A/B	Leakage Boundary	Polymers	Boiler Treated Water (Internal)	Change in Material Properties	Periodic Inspection Program (B.2.5)			F, 10
			Indoor Air (External)	Change in Material Properties	Structures Monitoring Program (B.1.31)			F, 10

Table 3.3.2.1.18 Heating & Process Steam System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Tanks - Deaerator CH-T-2, Condensate Return Unit T-13-1, Heating Boiler Condensate Storage Tank T-13-2, Heating Boiler Flash Tank T-13-3	Leakage Boundary	Carbon and low alloy steel	Auxiliary Steam (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-3 (S-04)	3.4.1-2	A
					Water Chemistry (B.1.2)	VIII.J-3 (S-04)	3.4.1-2	B
			Boiler Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.E-27 (S-09)	3.4.1-2	A
					Water Chemistry (B.1.2)	VIII.E-27 (S-09)	3.4.1-2	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VIII.H-7 (S-29)	3.4.1-5	E
Valve Body	Leakage Boundary	Carbon and low alloy steel	Auxiliary Steam (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-3 (S-04)	3.4.1-2	A
					Water Chemistry (B.1.2)	VIII.J-3 (S-04)	3.4.1-2	B, 9
			Boiler Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.E-27 (S-09)	3.4.1-2	A
					Water Chemistry (B.1.2)	VIII.E-27 (S-09)	3.4.1-2	B, 9

Table 3.3.2.1.18 Heading & Process Steam System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VIII.H-7 (S-29)	3.4.1-5	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VIII.H-8 (S-41)	3.4.1-5	E
		Cast Iron	Auxiliary Steam (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-3 (S-04)	3.4.1-2	A
					Selective Leaching of Materials (B.1.25)	VIII.E-18 (SP-27)	3.4.1-16	A, 6
					Water Chemistry (B.1.2)	VIII.J-3 (S-04)	3.4.1-2	B, 9
			Boiler Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.E-27 (S-09)	3.4.1-2	A
					Selective Leaching of Materials (B.1.25)	VIII.E-18 (SP-27)	3.4.1-16	A
					Water Chemistry (B.1.2)	VIII.E-27 (S-09)	3.4.1-2	B, 9
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VIII.H-7 (S-29)	3.4.1-5	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VIII.H-8 (S-41)	3.4.1-5	E

Table 3.3.2.1.18 Heading & Process Steam System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Leakage Boundary	Copper Alloy	Auxiliary Steam (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.K-1 (AP-70)	3.3.1-23	E, 6
					Selective Leaching of Materials (B.1.25)	VII.K-6 (AP-32)	3.3.1-65	A, 6
			Boiler Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.K-1 (AP-70)	3.3.1-23	E
					Selective Leaching of Materials (B.1.25)	VII.K-6 (AP-32)	3.3.1-65	A
			Indoor Air (External)	None	None	VIII.I-2 (SP-6)	3.4.1-32	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)			G, 3
		Stainless Steel	Auxiliary Steam (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	VIII.B2-1 (SP-45)	3.4.1-8	A
					Water Chemistry (B.1.2)	VIII.B2-1 (SP-45)	3.4.1-8	B
				Loss of Material	One-Time Inspection (B.1.24)	VIII.B2-2 (SP-46)	3.4.1-29	E, 5
					Water Chemistry (B.1.2)	VIII.B2-2 (SP-46)	3.4.1-29	B

Table 3.3.2.1.18 Heading & Process Steam System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Leakage Boundary	Stainless Steel	Boiler Treated Water (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	VIII.E-25 (SP-19)	3.4.1-8	A
					Water Chemistry (B.1.2)	VIII.E-25 (SP-19)	3.4.1-8	B
				Loss of Material	One-Time Inspection (B.1.24)	VII.K-7 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.K-7 (AP-57)	3.3.1-23	E
			Indoor Air (External)	None	None	VIII.I-11 (SP-12)	3.4.1-32	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The aging effects for carbon and alloy steel closure bolting in an outdoor air (external) environment also include loss of preload.
2. Steam coils mounted in ductwork and unit heater fixtures use copper tubing containing less that 15% zinc. Leaching is not required to be considered as an aging mechanism for these components.
3. The aging effect for copper or copper alloy (brass/bronze) in an outdoor air (external) environment is loss of material based on industry standards (EPRI Mechanical Tools Appendix E).
4. The Structures Monitoring Program includes external surface inspections but does not include internal surface inspections. The Periodic Inspection Program will inspect this component for internal aging effects.
5. The One-Time Inspection program has been added to the Water Chemistry program for aging management of stainless steel loss of material for this item.
6. The environment of auxiliary steam is considered similar to the environment of boiler treated water for evaluation of this component and material.
7. Copper tubing in these items contains less than 15% zinc and is not subject to leaching.
8. The Periodic Inspection Program will inspect copper coils mounted in rooftop (outside) ductwork.
9. Heating and Process Steam is not included in the Oyster Creek Flow-Accelerated Corrosion program due to periodic system operation and low sustained system flowrates.

10. The chemical feed addition tanks contain treated water with chemicals for conditioning of the auxiliary boiler feedwater. The external surfaces of these tanks will be examined per the Structures Monitoring Program. Internal surfaces of these tanks will be inspected for aging effects per the Periodic Inspection Program.
11. Component is constructed of coiled or rows of tubing and is considered to be in the piping, piping component, and piping element component category.

Table 3.3.2.1.19
Hydrogen & Oxygen Monitoring System
Summary of Aging Management Evaluation

Table 3.3.2.1.19 Hydrogen & Oxygen Monitoring System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Stainless Steel	Containment Atmosphere (External)	Loss Of Preload	Bolting Integrity (B.1.12)			G, 3
			Indoor Air (External)	Loss Of Preload	Bolting Integrity (B.1.12)			G, 3
Drain Trap (O2 Analyzers)	Leakage Boundary	Stainless Steel	Condensation (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.F3-5 (A-12)	3.3.1-23	E
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Filter Housing (O2 Analyzers)	Leakage Boundary	Stainless Steel	Condensation (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.F3-5 (A-12)	3.3.1-23	E
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Flexible Hose	Pressure Boundary	Stainless Steel	Dry Gas (Internal)	None	None	VII.J-21 (AP-22)	3.3.1-79	A
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Table 3.3.2.1.19 Hydrogen & Oxygen Monitoring System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flow Element	Pressure Boundary	Stainless Steel	Condensation (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.F3-5 (A-12)	3.3.1-23	E
			Containment Atmosphere (Internal)	None	None	VII.J-17 (AP-17)	3.3.1-76	A, 1
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Heat Exchangers (Air Cooled)	Pressure Boundary	Stainless Steel	Condensation (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.F3-5 (A-12)	3.3.1-23	E, 2
			Containment Atmosphere (Internal)	None	None	VII.J-17 (AP-17)	3.3.1-76	A, 1, 2
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A, 2
Moisture Separator (H2O2 Analyzers)	Pressure Boundary	Stainless Steel	Condensation (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.F3-5 (A-12)	3.3.1-23	E
			Containment Atmosphere (Internal)	None	None	VII.J-17 (AP-17)	3.3.1-76	A, 1
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Piping and fittings	Leakage Boundary	Stainless Steel	Condensation (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.F3-5 (A-12)	3.3.1-23	E

Table 3.3.2.1.19 Hydrogen & Oxygen Monitoring System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
	Pressure Boundary	Stainless Steel	Condensation (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.F3-5 (A-12)	3.3.1-23	E
			Containment Atmosphere (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Containment Atmosphere (Internal)	None	None	VII.J-17 (AP-17)	3.3.1-76	A, 1
			Dry Gas (Internal)	None	None	VII.J-21 (AP-22)	3.3.1-79	A
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
	Structural Support	Stainless Steel	Containment Atmosphere (Internal)	None	None	VII.J-17 (AP-17)	3.3.1-76	A, 1
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Pump Casing	Pressure Boundary	Stainless Steel	Condensation (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.F3-5 (A-12)	3.3.1-23	E
			Containment Atmosphere (Internal)	None	None	VII.J-17 (AP-17)	3.3.1-76	A, 1

Table 3.3.2.1.19 Hydrogen & Oxygen Monitoring System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pump Casing	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Restricting Orifice	Pressure Boundary	Stainless Steel	Containment Atmosphere (Internal)	None	None	VII.J-17 (AP-17)	3.3.1-76	A, 1
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
	Throttle	Stainless Steel	Containment Atmosphere (Internal)	None	None	VII.J-17 (AP-17)	3.3.1-76	A, 1
Sensor Element	Pressure Boundary	Stainless Steel	Containment Atmosphere (Internal)	None	None	VII.J-17 (AP-17)	3.3.1-76	A, 1
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Tanks (Volume Chamber)	Pressure Boundary	Stainless Steel	Condensation (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.F3-5 (A-12)	3.3.1-23	E
			Containment Atmosphere (Internal)	None	None	VII.J-17 (AP-17)	3.3.1-76	A, 1
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Valve Body	Leakage Boundary	Stainless Steel	Condensation (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.F3-5 (A-12)	3.3.1-23	E

Table 3.3.2.1.19 Hydrogen & Oxygen Monitoring System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
	Pressure Boundary	Copper Alloy	Dry Gas (Internal)	None	None	VII.J-5 (AP-9)	3.3.1-79	A
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
		Stainless Steel	Condensation (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.F3-5 (A-12)	3.3.1-23	E
			Containment Atmosphere (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Containment Atmosphere (Internal)	None	None	VII.J-17 (AP-17)	3.3.1-76	A, 1
			Dry Gas (Internal)	None	None	VII.J-21 (AP-22)	3.3.1-79	A
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Water Separator (O2 Analyzers)	Leakage Boundary	Stainless Steel	Condensation (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.F3-5 (A-12)	3.3.1-23	E
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The aging effects of the containment atmosphere (external) environment on stainless steel were applied to stainless steel with a containment atmosphere (internal) environment. The containment atmosphere environment aligns with the air - indoor uncontrolled GALL environment.
2. The air cooled heat exchanger is a coiled tube and is considered to be in the piping, piping component, and piping element component category.
3. The aging effect for stainless steel closure bolting in an indoor air or containment atmosphere (external) environment is loss of preload.

Table 3.3.2.1.20
Instrument (Control) Air System
Summary of Aging Management Evaluation

Table 3.3.2.1.20 Instrument (Control) Air System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Accumulator	Pressure Boundary	Carbon and low alloy steel	Containment Atmosphere (External)	None	None	VII.D-3 (A-80)	3.3.1-12	I, 4
			Dry Gas (Internal)	None	Compressed Air Monitoring (B.1.17)	VII.J-25 (AP-4)	3.3.1-80	E, 1
					None	VII.J-26 (AP-6)	3.3.1-79	A, 2
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.D-3 (A-80)	3.3.1-12	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-8 (A-78)	3.3.1-12	E
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Containment Atmosphere (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
			Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B

Table 3.3.2.1.20 Instrument (Control) Air System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Indoor Air (External)	Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
			Outdoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-1 (AP-28)	3.3.1-36	B
				Loss Of Preload	Bolting Integrity (B.1.12)			H, 3
		Stainless Steel	Containment Atmosphere (External)	Loss Of Preload	Bolting Integrity (B.1.12)			G
			Indoor Air (External)	Loss Of Preload	Bolting Integrity (B.1.12)			G
			Outdoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)			G
				Loss Of Preload	Bolting Integrity (B.1.12)			G
Filter Housing	Pressure Boundary	Zinc	Dry Gas (Internal)	None	Compressed Air Monitoring (B.1.17)			F, 1
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)			F
	Structural Support	Stainless Steel	Dry Gas (Internal)	None	Compressed Air Monitoring (B.1.17)	VII.J-20 (AP-20)	3.3.1-80	E, 1

Table 3.3.2.1.20 Instrument (Control) Air System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Filter Housing	Structural Support	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
		Zinc	Dry Gas (Internal)	None	Compressed Air Monitoring (B.1.17)			F, 1
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)			F
Flexible Hose	Pressure Boundary	Stainless Steel	Dry Gas (Internal)	None	Compressed Air Monitoring (B.1.17)	VII.J-20 (AP-20)	3.3.1-80	E, 1
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Flow Element	Structural Support	Stainless Steel	Dry Gas (Internal)	None	Compressed Air Monitoring (B.1.17)	VII.J-20 (AP-20)	3.3.1-80	E, 1
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Piping and fittings	Pressure Boundary	Brass	Containment Atmosphere (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Dry Gas (Internal)	None	Compressed Air Monitoring (B.1.17)	VII.J-4 (AP-8)	3.3.1-80	E, 1
					None	VII.J-5 (AP-9)	3.3.1-79	A, 2

Table 3.3.2.1.20 Instrument (Control) Air System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Brass	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)			G
		Carbon and low alloy steel	Containment Atmosphere (External)	None	None	VII.D-3 (A-80)	3.3.1-12	I, 4
			Dry Gas (Internal)	None	Compressed Air Monitoring (B.1.17)	VII.J-25 (AP-4)	3.3.1-80	E, 1
					None	VII.J-26 (AP-6)	3.3.1-79	A, 2
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.D-3 (A-80)	3.3.1-12	E
		Copper	Dry Gas (Internal)	None	Compressed Air Monitoring (B.1.17)	VII.J-4 (AP-8)	3.3.1-80	E, 1
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)			G
		Stainless Steel	Containment Atmosphere (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Table 3.3.2.1.20 Instrument (Control) Air System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Dry Gas (Internal)	None	Compressed Air Monitoring (B.1.17)	VII.J-20 (AP-20)	3.3.1-80	E, 1
					None	VII.J-21 (AP-22)	3.3.1-79	A, 2
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
	Structural Support	Brass	Containment Atmosphere (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Dry Gas (Internal)	None	Compressed Air Monitoring (B.1.17)	VII.J-4 (AP-8)	3.3.1-80	E, 1
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)			G
		Carbon and low alloy steel	Containment Atmosphere (External)	None	None	VII.D-3 (A-80)	3.3.1-12	I, 4
			Dry Gas (Internal)	None	Compressed Air Monitoring (B.1.17)	VII.J-25 (AP-4)	3.3.1-80	E, 1
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.D-3 (A-80)	3.3.1-12	E

Table 3.3.2.1.20 Instrument (Control) Air System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Structural Support	Copper	Dry Gas (Internal)	None	Compressed Air Monitoring (B.1.17)	VII.J-4 (AP-8)	3.3.1-80	E, 1
			Indoor Air (Internal)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)			G
		Stainless Steel	Containment Atmosphere (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Dry Gas (Internal)	None	Compressed Air Monitoring (B.1.17)	VII.J-20 (AP-20)	3.3.1-80	E, 1
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Valve Body	Pressure Boundary	Aluminum	Containment Atmosphere (External)	None	None	V.F-2 (EP-3)	3.2.1-32	A
			Dry Gas (Internal)	None	Compressed Air Monitoring (B.1.17)			G, 1
					None	VII.J-2 (AP-37)	3.3.1-79	A, 2
			Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	A

Table 3.3.2.1.20 Instrument (Control) Air System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Brass	Containment Atmosphere (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Dry Gas (Internal)	None	Compressed Air Monitoring (B.1.17)	VII.J-4 (AP-8)	3.3.1-80	E, 1
					None	VII.J-5 (AP-9)	3.3.1-79	A, 2
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)			G
		Carbon and low alloy steel	Containment Atmosphere (External)	None	None	VII.D-3 (A-80)	3.3.1-12	I, 4
			Dry Gas (Internal)	None	Compressed Air Monitoring (B.1.17)	VII.J-25 (AP-4)	3.3.1-80	E, 1
					None	VII.J-26 (AP-6)	3.3.1-79	A, 2
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.D-3 (A-80)	3.3.1-12	E
		Stainless Steel	Containment Atmosphere (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Table 3.3.2.1.20 Instrument (Control) Air System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Stainless Steel	Dry Gas (Internal)	None	Compressed Air Monitoring (B.1.17)	VII.J-20 (AP-20)	3.3.1-80	E, 1
					None	VII.J-21 (AP-22)	3.3.1-79	A, 2
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
	Structural Support	Brass	Dry Gas (Internal)	None	Compressed Air Monitoring (B.1.17)	VII.J-4 (AP-8)	3.3.1-80	E, 1
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
		Bronze	Dry Gas (Internal)	None	Compressed Air Monitoring (B.1.17)	VII.J-4 (AP-8)	3.3.1-80	E, 1
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
		Carbon and low alloy steel	Containment Atmosphere (External)	None	None	VII.D-3 (A-80)	3.3.1-12	I, 4
			Dry Gas (Internal)	None	Compressed Air Monitoring (B.1.17)	VII.J-25 (AP-4)	3.3.1-80	E, 1
					None	VII.J-26 (AP-6)	3.3.1-79	A, 2

Table 3.3.2.1.20 Instrument (Control) Air System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Structural Support	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.D-3 (A-80)	3.3.1-12	E
		Stainless Steel	Containment Atmosphere (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Dry Gas (Internal)	None	None	VII.J-21 (AP-22)	3.3.1-79	A, 2
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The environment of dried gas was used for the Instrument Air system. The Compressed Air Monitoring program is applied to the Instrument Air system components to confirm the internal environment remains sufficiently dry to preclude aging effects.
2. Normal internal environment for instrument air components in the drywell and containment penetration piping components is N2 gas.
3. The aging effects for carbon steel closure bolting in an outdoor environment also includes loss of preload.
4. Based on past precedence (NUREG-1796, Dresden and Quad Cities SER, paragraph 3.1.2.4.1), the Staff concluded that the loss of material due to corrosion is not considered a credible aging effect for carbon steel components in a containment nitrogen environment because of negligible amounts of free oxygen (less than 4 percent by volume during normal operation). Both oxygen and moisture must be present for general corrosion to occur because oxygen alone or water free of dissolved oxygen (high humidity in a nitrogen atmosphere) does not corrode carbon steel to any practical extent. The staff found the applicant’s identification of no loss of material for the carbon steel components exposed to a containment nitrogen environment acceptable because, with the negligible amounts of free oxygen, anodic reactions do not take place and the corrosion cell does not form. Therefore, no loss of material due to corrosion takes place and the aging effect is none.

Table 3.3.2.1.21
Main Fuel Oil Storage & Transfer System
Summary of Aging Management Evaluation

Table 3.3.2.1.21 Main Fuel Oil Storage & Transfer System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
Flexible Hose	Leakage Boundary	Stainless Steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-6 (AP-54)	3.3.1-54	B
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Flow Meter	Leakage Boundary	Cast Iron	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-10 (A-30)	3.3.1-20	B
					One-Time Inspection (B.1.24)	VII.H1-10 (A-30)	3.3.1-20	A

Table 3.3.2.1.21 Main Fuel Oil Storage & Transfer System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flow Meter	Leakage Boundary	Cast Iron	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-10 (A-30)	3.3.1-20	B
					One-Time Inspection (B.1.24)	VII.H1-10 (A-30)	3.3.1-20	A
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
		Stainless Steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-6 (AP-54)	3.3.1-54	B
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Pump Casing	Leakage Boundary	Cast Iron	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-10 (A-30)	3.3.1-20	B
					One-Time Inspection (B.1.24)	VII.H1-10 (A-30)	3.3.1-20	A
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Sight Glasses	Leakage Boundary	Brass	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-3 (AP-44)	3.3.1-26	B

Table 3.3.2.1.21 Main Fuel Oil Storage & Transfer System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Sight Glasses	Leakage Boundary	Brass	Fuel Oil (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.H1-3 (AP-44)	3.3.1-26	A
			Indoor Air (External)	None	None	VIII.I-2 (SP-6)	3.4.1-32	A
Strainer Body	Leakage Boundary	Cast Iron	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-10 (A-30)	3.3.1-20	B
					One-Time Inspection (B.1.24)	VII.H1-10 (A-30)	3.3.1-20	A
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Valve Body	Leakage Boundary	Carbon and low alloy steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-10 (A-30)	3.3.1-20	B
					One-Time Inspection (B.1.24)	VII.H1-10 (A-30)	3.3.1-20	A
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
		Stainless Steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry (B.1.22)	VII.H1-6 (AP-54)	3.3.1-54	B
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Table 3.3.2.1.22
Miscellaneous Floor and Equipment Drain System
Summary of Aging Management Evaluation

Table 3.3.2.1.22 Miscellaneous Floor and Equipment Drain System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
		Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
Flexible Hose	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-1 (SP-52)	3.4.1-11	E
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.E4-17 (AP-30)	3.3.1-16	E

Table 3.3.2.1.22 Miscellaneous Floor and Equipment Drain System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Lubricating Oil (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-17 (AP-30)	3.3.1-16	E
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-2 (SP-51)	3.4.1-6	E
			Soil (External)	Loss of Material	Buried Piping Inspection (B.1.26)	VII.C1-19 (A-01)	3.3.1-18	B
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-1 (SP-52)	3.4.1-11	E
	Pressure Boundary	Carbon and low alloy steel	Concrete (External)	None	None	VII.J-24 (AP-3)	3.3.1-78	A
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.C1-18 (A-32)	3.3.1-63	E, 1
Pump Casing (Lab Drain Tank Pump P-22-003)	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-1 (SP-52)	3.4.1-11	E

Table 3.3.2.1.22 Miscellaneous Floor and Equipment Drain System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pump Casing (Laundry Drain Tank Pump P-22-002)	Leakage Boundary	Cast Iron	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-2 (SP-51)	3.4.1-6	E
					Selective Leaching of Materials (B.1.25)	VII.C1-9 (A-51)	3.3.1-67	A
Pump Casings (Regeneration Waste Transfer Pumps P-22-28A,B and P-22-29A,B)	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-1 (SP-52)	3.4.1-11	E
Strainer Body	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-2 (SP-51)	3.4.1-6	E
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Table 3.3.2.1.22 Miscellaneous Floor and Equipment Drain System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Strainer Body	Leakage Boundary	Stainless Steel	Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-1 (SP-52)	3.4.1-11	E
Tanks (Lab Drain Tank T-22-003)	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-1 (SP-52)	3.4.1-11	E
Tanks (Laundry Drain Tank T-22-002)	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-2 (SP-51)	3.4.1-6	E
Tanks (Oil Separator DS-Y-105 and Oil Receiver DS-T-1)	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-2 (SP-51)	3.4.1-6	E
Tanks (Regeneration System Waste Tank 1-1 Low and High Conductivity Compartments)	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E

Table 3.3.2.1.22 Miscellaneous Floor and Equipment Drain System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Tanks (Regeneration System Waste Tank 1-1 Low and High Conductivity Compartments)	Leakage Boundary	Carbon and low alloy steel	Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-2 (SP-51)	3.4.1-6	E
Valve Body	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.E4-17 (AP-30)	3.3.1-16	E
					One-Time Inspection (B.1.24)	VII.E4-17 (AP-30)	3.3.1-16	E
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-2 (SP-51)	3.4.1-6	E
		Cast Iron	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-2 (SP-51)	3.4.1-6	E
					Selective Leaching of Materials (B.1.25)	VII.C1-9 (A-51)	3.3.1-67	A
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Table 3.3.2.1.22 Miscellaneous Floor and Equipment Drain System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Leakage Boundary	Stainless Steel	Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-1 (SP-52)	3.4.1-11	E

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The One-Time Inspection program confirms the absence of aging effects in pooled or potentially stagnant flow areas of drain piping and piping elements.

Table 3.3.2.1.23
Nitrogen Supply System
Summary of Aging Management Evaluation

Table 3.3.2.1.23 Nitrogen Supply System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
			Outdoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-1 (AP-28)	3.3.1-36	B
				Loss Of Preload	Bolting Integrity (B.1.12)			H, 1
		Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
			Outdoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-1 (AP-28)	3.3.1-36	B
				Loss Of Preload	Bolting Integrity (B.1.12)			H, 1

Table 3.3.2.1.23 Nitrogen Supply System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Stainless Steel	Indoor Air (External)	Loss Of Preload	Bolting Integrity (B.1.12)			G
			Outdoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)			G, 2
				Loss Of Preload	Bolting Integrity (B.1.12)			G
Drip Leg	Pressure Boundary	Stainless Steel	Condensation (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.F3-5 (A-12)	3.3.1-23	E
			Dry Gas (Internal)	None	None	VII.J-21 (AP-22)	3.3.1-79	A
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Heat Exchangers (Electric Heater)	Pressure Boundary	Carbon and low alloy steel	Dry Gas (Internal)	None	None	VII.J-26 (AP-6)	3.3.1-79	C
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-8 (A-78)	3.3.1-12	E
Heat Exchangers (Trim Heater)	Heat Transfer	Brass (vortex generators)	Dry Gas (External)	None	None	VII.J-5 (AP-9)	3.3.1-79	C
		Stainless Steel	Dry Gas (Internal)	None	None	VII.J-21 (AP-22)	3.3.1-79	C

Table 3.3.2.1.23 Nitrogen Supply System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchangers (Trim Heater)	Heat Transfer	Stainless Steel	Encased	None	None			G, 4
	Pressure Boundary	Stainless Steel (Tubing)	Dry Gas (Internal)	None	None	VII.J-21 (AP-22)	3.3.1-79	C
			Encased	None	None			G, 4
Heat Exchangers (Vaporizer)	Heat Transfer	Aluminum	Dry Gas (Internal)	None	None	VII.J-2 (AP-37)	3.3.1-79	C
	Pressure Boundary	Aluminum	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
Piping and fittings	Pressure Boundary	Carbon and low alloy steel	Dry Gas (Internal)	None	None	VII.J-26 (AP-6)	3.3.1-79	A
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-8 (A-78)	3.3.1-12	E
		Copper	Dry Gas (Internal)	None	None	VII.J-5 (AP-9)	3.3.1-79	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)			G

Table 3.3.2.1.23 Nitrogen Supply System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Condensation (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.F3-5 (A-12)	3.3.1-23	E
			Dry Gas (Internal)	None	None	VII.J-21 (AP-22)	3.3.1-79	A
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
Pressure Building Coils	Pressure Boundary	Aluminum	Dry Gas (Internal)	None	None	VII.J-2 (AP-37)	3.3.1-79	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
Restricting Orifice	Pressure Boundary	Stainless Steel	Dry Gas (Internal)	None	None	VII.J-21 (AP-22)	3.3.1-79	A
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
	Throttle	Stainless Steel	Dry Gas (Internal)	None	None	VII.J-21 (AP-22)	3.3.1-79	A
Rupture Disks	Pressure Boundary	Bronze	Dry Gas (Internal)	None	None	VII.J-5 (AP-9)	3.3.1-79	A

Table 3.3.2.1.23 Nitrogen Supply System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Rupture Disks	Pressure Boundary	Bronze	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)			G
		Stainless Steel	Dry Gas (Internal)	None	None	VII.J-21 (AP-22)	3.3.1-79	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
Sight Glasses (Flow Indication)	Pressure Boundary	Brass	Dry Gas (Internal)	None	None	VII.J-5 (AP-9)	3.3.1-79	A
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
		Glass	Dry Gas (Internal)	None	None			G, 3
			Indoor Air (External)	None	None	VII.J-10 (AP-14)	3.3.1-75	A
Strainer	Filter	Bronze	Dry Gas (External)	None	None	VII.J-5 (AP-9)	3.3.1-79	A
Strainer Body	Pressure Boundary	Bronze	Dry Gas (Internal)	None	None	VII.J-5 (AP-9)	3.3.1-79	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)			G

Table 3.3.2.1.23 Nitrogen Supply System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Tanks	Pressure Boundary	Carbon and low alloy steel	Dry Gas (Internal)	None	None	VII.J-26 (AP-6)	3.3.1-79	C
			Outdoor Air (External)	Loss of Material	Aboveground Outdoor Tanks (B.1.21)	VII.H1-11 (A-95)	3.3.1-33	B
Thermowell	Pressure Boundary	Carbon and low alloy steel	Dry Gas (Internal)	None	None	VII.J-26 (AP-6)	3.3.1-79	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-8 (A-78)	3.3.1-12	E
Valve Body	Pressure Boundary	Brass	Dry Gas (Internal)	None	None	VII.J-5 (AP-9)	3.3.1-79	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)			G
		Bronze	Dry Gas (Internal)	None	None	VII.J-5 (AP-9)	3.3.1-79	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)			G
		Carbon and low alloy steel	Dry Gas (Internal)	None	None	VII.J-26 (AP-6)	3.3.1-79	A
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E

Table 3.3.2.1.23 Nitrogen Supply System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Carbon and low alloy steel	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-8 (A-78)	3.3.1-12	E
		Stainless Steel	Condensation (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.F3-5 (A-12)	3.3.1-23	E
			Dry Gas (Internal)	None	None	VII.J-21 (AP-22)	3.3.1-79	A
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The Bolting Integrity program provides adequate aging management for the Loss of Preload aging effect for bolting in an outdoor air environment.
2. The aging effect for stainless steel in an outdoor air (external) environment is loss of material based on industry standards (EPRI Mechanical Tools Appendix E)
3. There are no aging effects for glass in a gas environment, based on other NUREG-1801 items for glass, such as VII.J-10 (AP-14) for glass in an indoor air environment.
4. There are no aging effects for stainless steel encased in aluminum, based on industry guidance.

Table 3.3.2.1.24
Noble Metals Monitoring System
Summary of Aging Management Evaluation

Table 3.3.2.1.24 Noble Metals Monitoring System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Indoor Air (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	VII.E3-19 (A-34)	3.3.1-2	C, 2
				Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
		Carbon and low alloy steel	Indoor Air (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	VII.E3-19 (A-34)	3.3.1-2	C, 2
				Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
Flow Element	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E3-17 (AP-57)	3.3.1-23	E

Table 3.3.2.1.24 Noble Metals Monitoring System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flow Element	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	Water Chemistry (B.1.2)	VII.E3-17 (AP-57)	3.3.1-23	E
Piping and fittings	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	VII.E3-18 (A-60)	3.3.1-31	E, 1
					Water Chemistry (B.1.2)	VII.E3-18 (A-60)	3.3.1-31	E, 1
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	VII.E3-16 (A-62)	3.3.1-2	A, 2
				Loss of Material	One-Time Inspection (B.1.24)	VII.E3-17 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.E3-17 (AP-57)	3.3.1-23	E
Sensor Element	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E3-17 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.E3-17 (AP-57)	3.3.1-23	E

Table 3.3.2.1.24 Noble Metals Monitoring System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E3-17 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.E3-17 (AP-57)	3.3.1-23	E

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The BWR Reactor Water Cleanup System program does not apply to piping and piping welds <4" nominal pipe size. Water Chemistry and the One-Time Inspection programs will be used to confirm that cracking/stress corrosion cracking/intergranular stress corrosion cracking is not occuring in piping and piping welds <4" nominal pipe size.
2. The Noble Metals Monitoring System is exposed to reactor temperature and pressure and is subject to cumulative fatigue.

Table 3.3.2.1.25
Post-Accident Sampling System
Summary of Aging Management Evaluation

Table 3.3.2.1.25 Post-Accident Sampling System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Indoor Air (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
						V.E-4 (EP-25)	3.2.1-25	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B
								B, 2
		Carbon and low alloy steel	Indoor Air (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
						V.E-4 (EP-25)	3.2.1-25	B

Table 3.3.2.1.25 Post-Accident Sampling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Indoor Air (External)	Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B
								B, 2
		Stainless Steel	Containment Atmosphere (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C2-11 (R-18)	3.1.1-1	A
				Loss Of Preload	Bolting Integrity (B.1.12)			G, 3
			Indoor Air (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C2-11 (R-18)	3.1.1-1	A
				Loss Of Preload	Bolting Integrity (B.1.12)			G, 3
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.D2-2 (E-26)	3.2.1-2	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Table 3.3.2.1.25 Post-Accident Sampling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.D2-2 (E-26)	3.2.1-2	E
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-2 (R-55)	3.1.1-21	B, 1
					One-Time Inspection (B.1.24)	IV.C1-2 (R-55)	3.1.1-21	A
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-27 (E-08)	3.2.1-10	A
					Water Chemistry (B.1.2)	V.D2-27 (E-08)	3.2.1-10	B
				Not Applicable	None	IV.C1-1 (R-03)	3.1.1-9	I, 7
		Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A

Table 3.3.2.1.25 Post-Accident Sampling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-1 (R-03)	3.1.1-9	B, 1
						IV.C1-2 (R-55)	3.1.1-21	B, 1
					One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	A
						IV.C1-2 (R-55)	3.1.1-21	A
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E

Table 3.3.2.1.25 Post-Accident Sampling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Structural Support	Stainless Steel	Containment Atmosphere (Internal)	None	None	VII.J-17 (AP-17)	3.3.1-76	A, 4
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Valve Body	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.D2-2 (E-26)	3.2.1-2	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	V.D2-2 (E-26)	3.2.1-2	E
			Treated Water (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	IV.C1-2 (R-55)	3.1.1-21	E, 5, 6

Table 3.3.2.1.25 Post-Accident Sampling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Carbon and low alloy steel	Treated Water (Internal)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	V.D2-27 (E-08)	3.2.1-10	A
					Water Chemistry (B.1.2)	V.D2-27 (E-08)	3.2.1-10	B
				Not Applicable	None	IV.C1-1 (R-03)	3.1.1-9	I, 5, 7
		Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Indoor Air (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Treated Water (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	E, 5, 6
						IV.C1-2 (R-55)	3.1.1-21	E, 5, 6
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	E, 5, 6
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A

Table 3.3.2.1.25 Post-Accident Sampling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	V.D2-23 (EP-32)	3.2.1-3	E
					Water Chemistry (B.1.2)	V.D2-23 (EP-32)	3.2.1-3	E

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. ASME Section XI Inservice Inspection Subsections IWB, IWC, and IWD are not applicable to RCPB P.A.S.S. piping and components <= 1 in. N.P.S.
2. Line item IV.C1-12 (R-27) for loss of preload for RCPB closure bolting does not apply since the A 193 B7 alloy steel closure bolting is not high-strength. Line item V.E-5 (EP-24) has been applied to the loss of preload aging effect for RCPB closure bolting.
3. The aging effects for stainless steel closure bolting include loss of preload.
4. The aging effects of the containment atmosphere (external) environment on stainless steel were applied to stainless steel with a containment atmosphere (internal) environment. The containment atmosphere environment aligns with the air - indoor uncontrolled NUREG-1801 environment.
5. The applicable Aging Management Programs recommended in NUREG-1801 for Class 1 carbon and stainless steel piping, fittings, and branch connections < 4 in. N.P.S. are also specified here for Class 1 valve bodies < 4 in. N.P.S.
6. ASME XI Inservice Inspection, Subsections IWB, IWC, IWD does not apply to cracking of valves
7. Stress corrosion cracking and intergranular stress corrosion cracking of carbon and low alloy steels are not considered applicable aging mechanisms in a treated water environment per EPRI Mechanical Tools, Appendix A.

Table 3.3.2.1.26
Process Sampling System
Summary of Aging Management Evaluation

Table 3.3.2.1.26 Process Sampling System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
		Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
Coolers	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A, 2
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A, 2
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B, 2
Evaporator	Leakage Boundary	Copper	Closed Cooling Water < 140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.F1-13 (AP-34)	3.3.1-38	B

Table 3.3.2.1.26 Process Sampling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Evaporator	Leakage Boundary	Copper	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
Flexible Hose	Leakage Boundary	Elastomer	Indoor Air (External)	Change in Material Properties	Structures Monitoring Program (B.1.31)	VII.F2-7 (A-36)	3.3.1-10	E
			Treated Water <140F (Internal)	Change in Material Properties	Periodic Inspection Program (B.2.5)	VII.A4-1 (A-16)	3.3.1-11	E
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
Flow Element	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Closed Cooling Water < 140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	B

Table 3.3.2.1.26 Process Sampling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Closed Cooling Water < 140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.C2-14 (A-25)	3.3.1-42	E, 1
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
		Stainless Steel	Closed Cooling Water < 140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-9 (A-52)	3.3.1-39	B
					One-Time Inspection (B.1.24)	VII.C2-9 (A-52)	3.3.1-39	E, 1
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
Pump Casing	Leakage Boundary	Carbon and low alloy steel	Closed Cooling Water < 140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Sensor Element	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Table 3.3.2.1.26 Process Sampling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Sensor Element	Leakage Boundary	Stainless Steel	Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
Sight Glasses	Leakage Boundary	Glass	Indoor Air (External)	None	None	VII.J-10 (AP-14)	3.3.1-75	A
			Treated Water <140F (Internal)	None	None	VII.J-15 (AP-51)	3.3.1-75	A
Tanks (Reservoir)	Leakage Boundary	Carbon and low alloy steel	Closed Cooling Water < 140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Thermowell	Leakage Boundary	Stainless Steel	Closed Cooling Water < 140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-9 (A-52)	3.3.1-39	B
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B

Table 3.3.2.1.26 Process Sampling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Leakage Boundary	Carbon and low alloy steel	Closed Cooling Water < 140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
		Stainless Steel	Closed Cooling Water < 140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-9 (A-52)	3.3.1-39	B
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The One-Time Inspection program confirms the absence of aging effects in stagnant flow areas.
2. Coolers that consist of coiled tubing are included in the component category of piping, piping components, and piping elements.

Table 3.3.2.1.27
Radiation Monitoring System
Summary of Aging Management Evaluation

Table 3.3.2.1.27 Radiation Monitoring System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	V.E-4 (EP-25)	3.2.1-25	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B
		Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	V.E-4 (EP-25)	3.2.1-25	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B
		Stainless Steel	Indoor Air (External)	Loss Of Preload	Bolting Integrity (B.1.12)			G
Piping and fittings	Pressure Boundary	Stainless Steel	Containment Atmosphere (Internal)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
	Structural Support	Stainless Steel	Containment Atmosphere (Internal)	None	None	V.F-14 (EP-18)	3.2.1-35	A

Table 3.3.2.1.27 Radiation Monitoring System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Structural Support	Stainless Steel	Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
Valve Body	Pressure Boundary	Stainless Steel	Containment Atmosphere (Internal)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A
	Structural Support	Stainless Steel	Containment Atmosphere (Internal)	None	None	V.F-14 (EP-18)	3.2.1-35	A
			Indoor Air (External)	None	None	V.F-14 (EP-18)	3.2.1-35	A

Notes	**Definition of Note**
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Table 3.3.2.1.28
Radwaste Area Heating and Ventilation System
Summary of Aging Management Evaluation

Table 3.3.2.1.28 Radwaste Area Heating and Ventilation System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-1 (AP-28)	3.3.1-36	E, 1
		Stainless Steel	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	A
Damper housing	Pressure Boundary	Aluminum	Indoor Air (Internal)	None	None	V.F-2 (EP-3)	3.2.1-32	C, 2
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
		Galvanized Steel	Indoor Air (Internal)	None	None	VII.J-8 (AP-13)	3.3.1-74	C, 2
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
Door Seal	Pressure Boundary	Elastomer	Indoor Air (Internal)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F2-10 (A-17)	3.3.1-10	E
				Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F2-9 (A-18)	3.3.1-28	E

Table 3.3.2.1.28 Radwaste Area Heating and Ventilation System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Door Seal	Pressure Boundary	Elastomer	Outdoor Air (External)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)			G
				Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)			G
Ductwork	Pressure Boundary	Aluminum	Indoor Air (Internal)	None	None	V.F-2 (EP-3)	3.2.1-32	C, 2
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
Fan Housing	Pressure Boundary	Carbon and low alloy steel	Indoor Air (Internal)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F2-2 (A-08)	3.3.1-16	E
			Outdoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.I-8 (A-78)	3.3.1-12	E
Flexible Connection	Pressure Boundary	Elastomer	Indoor Air (Internal)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F2-10 (A-17)	3.3.1-10	E
			Outdoor Air (External)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)			G

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. Ventilation system duct bolting is similar to structural bolting in that it provides structural support for ventilation system assemblies, which is functionally different from piping system pressure retaining closure bolting. The Bolting Integrity program does not provide for long-term condition monitoring inspections of ventilation duct bolting. Therefore, the Structures Monitoring Program is appropriate to detect and manage the aging effects of ventilation system duct bolting by periodic visual inspection.
2. Ventilation system components in the scope of license renewal at Oyster Creek are not subject to internal condensation. A review of the maintenance history of these components has not identified degradation due to the presence of internal condensation. Preventive maintenance activities and system manager walkdowns have not identified or reported internal condensation or resulting internal ventilation system degradation in these components. Therefore, the internal environment for ventilation system components in the scope of license renewal is "Indoor Air (Internal)."

Table 3.3.2.1.29
Reactor Building Closed Cooling Water System
Summary of Aging Management Evaluation

Table 3.3.2.1.29 Reactor Building Closed Cooling Water System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Containment Atmosphere (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
			Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
		Carbon and low alloy steel	Containment Atmosphere (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
			Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B

Table 3.3.2.1.29 Reactor Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Coolers (Cleanup Auxiliary Pump)	Leakage Boundary	Carbon Steel (Pedestal Cooler)	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	D, 11
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E, 11
		Cast Iron (Bearing Housing Cooler)	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-7 (A-50)	3.3.1-43	D, 10
					Selective Leaching of Materials (B.1.25)	VII.C2-7 (A-50)	3.3.1-43	C, 10
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E, 10
		Stainless Steel (Seal Cooler)	Closed Cooling Water < 140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-9 (A-52)	3.3.1-39	D, 9
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	C, 9
Coolers (Cleanup Pre-coat Pump)	Leakage Boundary	Carbon Steel (Shell Side Components)	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-1 (A-63)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Coolers (Cleanup Recirc. Pumps Lube Oil)	Leakage Boundary	Cast Iron (Tube Side Components)	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-7 (A-50)	3.3.1-43	D

Table 3.3.2.1.29 Reactor Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Coolers (Cleanup Recirc. Pumps Lube Oil)	Leakage Boundary	Cast Iron (Tube Side Components)	Closed Cooling Water (Internal)	Loss of Material	Selective Leaching of Materials (B.1.25)	VII.C2-7 (A-50)	3.3.1-43	C
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Coolers (Containment Spray Pump Room)	Leakage Boundary	Copper	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-3 (AP-12)	3.3.1-38	B, 6
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A, 6
Coolers (Core Spray Pump Room)	Leakage Boundary	Copper	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-3 (AP-12)	3.3.1-38	B, 6
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A, 6
Coolers (Drywell Cooling Units)	Leakage Boundary	Copper	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-3 (AP-12)	3.3.1-38	B, 6
			Containment Atmosphere (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A, 6
Coolers (Post Accident Sample)	Leakage Boundary	Copper	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-3 (AP-12)	3.3.1-38	B, 6

Table 3.3.2.1.29 Reactor Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Coolers (Post Accident Sample)	Leakage Boundary	Copper	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A, 6
Coolers (Sample)	Leakage Boundary	Copper	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-3 (AP-12)	3.3.1-38	B, 6
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A, 6
Coolers (Shutdown Cooling Pumps)	Heat Transfer	Cast Iron (Bearing Housing Cooler)	Closed Cooling Water (Internal)	Reduction of Heat Transfer	Closed-Cycle Cooling Water System (B.1.14)			H, 1, 4, 10
			Lubricating Oil (External)	Reduction of Heat Transfer	Lubricating Oil Monitoring Activities (B.2.2)			H, 1, 10
		Copper (Seal Cooler Tubes)	Closed Cooling Water (External)	Reduction of Heat Transfer	Closed-Cycle Cooling Water System (B.1.14)			H, 1, 4
			Treated Water (Internal)	Reduction of Heat Transfer	Water Chemistry (B.1.2)			G, 1, 4
	Pressure Boundary	Carbon Steel (Seal Cooler Shell Side Components)	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-1 (A-63)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E

Table 3.3.2.1.29 Reactor Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Coolers (Shutdown Cooling Pumps)	Pressure Boundary	Cast Iron (Bearing Housing Cooler)	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-7 (A-50)	3.3.1-43	D, 10
					Selective Leaching of Materials (B.1.25)	VII.C2-7 (A-50)	3.3.1-43	C, 10
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E, 10
			Lubricating Oil (External)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.C2-13 (AP-30)	3.3.1-16	E, 10
					One-Time Inspection (B.1.24)	VII.C2-13 (AP-30)	3.3.1-16	E, 10
		Copper (Seal Cooler Tubes and Tube Side Components)	Closed Cooling Water (External)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-3 (AP-12)	3.3.1-38	D
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.C2-5 (AP-64)	3.3.1-38	E, 5
					Water Chemistry (B.1.2)	VII.C2-5 (AP-64)	3.3.1-38	E, 5
Coolers (Tunnel)	Leakage Boundary	Copper	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-3 (AP-12)	3.3.1-38	B, 6

Table 3.3.2.1.29 Reactor Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Coolers (Tunnel)	Leakage Boundary	Copper	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A, 6
Filter Housing	Leakage Boundary	Stainless Steel	Closed Cooling Water <140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-9 (A-52)	3.3.1-39	B
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Flow Element	Pressure Boundary	Stainless Steel	Closed Cooling Water <140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-9 (A-52)	3.3.1-39	B
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Gauge Snubber	Leakage Boundary	Stainless Steel	Closed Cooling Water <140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-9 (A-52)	3.3.1-39	B
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
	Pressure Boundary	Stainless Steel	Closed Cooling Water <140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-9 (A-52)	3.3.1-39	B
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Table 3.3.2.1.29 Reactor Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchangers (Augmented Fuel Pool Cooling)	Heat Transfer	Stainless Steel (Plates)	Closed Cooling Water (Internal)	Reduction of Heat Transfer	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-2 (AP-63)	3.3.1-40	D, 7
			Treated Water (Internal)	Reduction of Heat Transfer	Water Chemistry (B.1.2)	VII.A4-4 (AP-62)	3.3.1-69	D, 7
	Pressure Boundary	Carbon Steel (Covers, Nozzles)	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-1 (A-63)	3.3.1-42	D, 7
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E, 7
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.E-3 (S-18)	3.4.1-2	C, 7
					Water Chemistry (B.1.2)	VIII.E-3 (S-18)	3.4.1-2	D, 7
		Stainless Steel (Plates)	Closed Cooling Water < 140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.E4-2 (A-67)	3.3.1-41	D, 7

Table 3.3.2.1.29 Reactor Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchangers (Augmented Fuel Pool Cooling)	Pressure Boundary	Stainless Steel (Plates)	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A, 7
			Treated Water < 140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-3 (A-70)	3.3.1-22	C, 7
					Water Chemistry (B.1.2)	VII.A4-3 (A-70)	3.3.1-22	D, 7
	Structural Support	Carbon Steel (Carrying Bars)	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E, 7
				None	None	VII.J-17 (AP-17)	3.3.1-76	A, 7
Heat Exchangers (Cleanup Non-Regenerative)	Leakage Boundary	Carbon Steel (Shell Side Components)	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-1 (A-63)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E

Table 3.3.2.1.29 Reactor Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchangers (Drywell Equipment Drain Tank)	Leakage Boundary	Carbon Steel (Covers)	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-1 (A-63)	3.3.1-42	D, 7
			Containment Atmosphere (External)	None	None	VII.I-7 (A-77)	3.3.1-12	I, 7, 8
		Stainless Steel (Nozzles, Plates)	Closed Cooling Water < 140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.E4-2 (A-67)	3.3.1-41	D, 7
			Containment Atmosphere (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A, 7
	Structural Support	Stainless Steel (Carrying Bars)	Containment Atmosphere (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A, 7
Heat Exchangers (Fuel Pool Cooling)	Heat Transfer	Carbon Steel (Tubes)	Closed Cooling Water (External)	Reduction of Heat Transfer	Closed-Cycle Cooling Water System (B.1.14)			G, 1, 4
			Treated Water (Internal)	Reduction of Heat Transfer	Water Chemistry (B.1.2)			G, 1, 4

Table 3.3.2.1.29 Reactor Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchangers (Fuel Pool Cooling)	Pressure Boundary	Carbon Steel (Shell Side Components)	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-1 (A-63)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
		Carbon Steel (Tube Side Components)	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.E-3 (S-18)	3.4.1-2	C
					Water Chemistry (B.1.2)	VIII.E-3 (S-18)	3.4.1-2	D
		Carbon Steel (Tubes)	Closed Cooling Water (External)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-1 (A-63)	3.3.1-42	D
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.E-3 (S-18)	3.4.1-2	C
					Water Chemistry (B.1.2)	VIII.E-3 (S-18)	3.4.1-2	D

Table 3.3.2.1.29 Reactor Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchangers (Reactor Building Closed Cooling Water)								12
Heat Exchangers (Shutdown Cooling)	Heat Transfer	Stainless Steel (Tubes)	Closed Cooling Water (External)	Reduction of Heat Transfer	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-2 (AP-63)	3.3.1-40	B
			Treated Water (Internal)	Reduction of Heat Transfer	Water Chemistry (B.1.2)	VII.E3-6 (AP-62)	3.3.1-69	B
	Pressure Boundary	Carbon Steel (Shell Side Components)	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-1 (A-63)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
		Carbon Steel (Tube Side Components)	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.E-3 (S-18)	3.4.1-2	C
					Water Chemistry (B.1.2)	VIII.E-3 (S-18)	3.4.1-2	D

Table 3.3.2.1.29 Reactor Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchangers (Shutdown Cooling)	Pressure Boundary	Stainless Steel (Tube Sheet)	Treated Water <140F	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-3 (A-70)	3.3.1-22	A, 3
					Water Chemistry (B.1.2)	VII.A4-3 (A-70)	3.3.1-22	B, 3
		Stainless Steel (Tubes)	Closed Cooling Water <140F (External)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.E4-2 (A-67)	3.3.1-41	B
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-3 (A-70)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.A4-3 (A-70)	3.3.1-22	B
Level Glass	Leakage Boundary	Copper Alloy	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-3 (AP-12)	3.3.1-38	B
					Selective Leaching of Materials (B.1.25)	VII.A4-8 (AP-43)	3.3.1-65	A
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
		Glass	Closed Cooling Water (Internal)	None	None			G, 1

Table 3.3.2.1.29 Reactor Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Level Glass	Leakage Boundary	Glass	Indoor Air (External)	None	None	VII.J-10 (AP-14)	3.3.1-75	A
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	B
					One-Time Inspection (B.1.24)	VII.C2-14 (A-25)	3.3.1-42	E, 2
			Containment Atmosphere (External)	None	None	VII.I-7 (A-77)	3.3.1-12	I, 8
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
		Cast Iron	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-7 (A-50)	3.3.1-43	B
					One-Time Inspection (B.1.24)	VII.C2-7 (A-50)	3.3.1-43	E, 2
					Selective Leaching of Materials (B.1.25)	VII.C2-7 (A-50)	3.3.1-43	A
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
		Stainless Steel	Closed Cooling Water < 140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-9 (A-52)	3.3.1-39	B

Table 3.3.2.1.29 Reactor Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Leakage Boundary	Stainless Steel	Closed Cooling Water < 140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.C2-9 (A-52)	3.3.1-39	E, 2
			Containment Atmosphere (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
	Pressure Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	B
					One-Time Inspection (B.1.24)	VII.C2-14 (A-25)	3.3.1-42	E, 2
			Containment Atmosphere (External)	None	None	VII.I-7 (A-77)	3.3.1-12	I, 8
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Soil (External)	Loss of Material	Buried Piping Inspection (B.1.26)	VII.G-22 (A-01)	3.3.1-18	B
		Stainless Steel	Closed Cooling Water <140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-9 (A-52)	3.3.1-39	B
					One-Time Inspection (B.1.24)	VII.C2-9 (A-52)	3.3.1-39	E, 2

Table 3.3.2.1.29 Reactor Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Containment Atmosphere (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Pump Casing (Chemical Feed Pump)	Leakage Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Pump Casing (RBCCW Pumps)	Pressure Boundary	Cast Iron	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-7 (A-50)	3.3.1-43	B
					Selective Leaching of Materials (B.1.25)	VII.C2-7 (A-50)	3.3.1-43	A
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Rupture Disks	Leakage Boundary	Aluminum	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)			G, 1
			Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	A
Strainer Body	Leakage Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	B

Table 3.3.2.1.29 Reactor Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Strainer Body	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Tanks (Chemical Mixing Tank)	Leakage Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Tanks (RBCCW Surge Tank)	Pressure Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Thermowell	Leakage Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
		Stainless Steel	Closed Cooling Water < 140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-9 (A-52)	3.3.1-39	B
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
	Pressure Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	B

Table 3.3.2.1.29 Reactor Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Thermowell	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
		Stainless Steel	Closed Cooling Water <140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-9 (A-52)	3.3.1-39	B
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Valve Body	Leakage Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	B
			Containment Atmosphere (External)	None	None	VII.I-7 (A-77)	3.3.1-12	I, 8
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
		Copper Alloy	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-3 (AP-12)	3.3.1-38	B
				Loss of Material	Selective Leaching of Materials (B.1.25)	VII.A4-8 (AP-43)	3.3.1-65	A
			Containment Atmosphere (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A

Table 3.3.2.1.29 Reactor Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Leakage Boundary	Stainless Steel	Closed Cooling Water <140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-9 (A-52)	3.3.1-39	B
			Containment Atmosphere (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
	Pressure Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	B
			Containment Atmosphere (External)	None	None	VII.I-7 (A-77)	3.3.1-12	I, 8
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
		Copper Alloy	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-3 (AP-12)	3.3.1-38	B
				Loss of Material	Selective Leaching of Materials (B.1.25)	VII.A4-8 (AP-43)	3.3.1-65	A
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
		Stainless Steel	Closed Cooling Water <140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-9 (A-52)	3.3.1-39	B

Table 3.3.2.1.29 Reactor Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Stainless Steel	Containment Atmosphere (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The aging effects for this material/environment combination are consistent with industry standards.
2. The One-Time Inspection program confirms the absence of aging effects in stagnant flow areas.
3. The tube sheet is carbon steel with stainless steel overlay. The carbon steel side of the tube sheet is evaluated with the shell side components.
4. The aging effects for this material/environment combination are managed by the Water Chemistry or Closed-Cycle Cooling Water System programs.
5. The Closed-Cycle Cooling Water System program does not apply to a treated water environment. The appropriate programs for managing the identified aging effects in a treated water environment are Water Chemistry and One-Time Inspection.
6. Coolers that consist only of coiled tubing or rows of tubing are included in the component category of piping, piping components, and piping elements.
7. Heat exchanger is a plate type heat exchanger consisting of plates, covers, nozzles, and carrying bars.
8. Based on past precedence (NUREG-1796, Dresden and Quad Cities SER, paragraph 3.1.2.4.1), the Staff concluded that the loss of material due to corrosion is not considered a credible aging effect for carbon steel components in a containment nitrogen environment because of negligible amounts of free oxygen (less than 4 percent by volume during normal operation). Both oxygen and moisture must be present for general corrosion to occur because oxygen alone or water free of dissolved oxygen (high humidity in a nitrogen atmosphere) does not corrode carbon steel to any

practical extent. The staff found the applicant’s identification of no loss of material for the carbon steel components exposed to a containment nitrogen environment acceptable because, with the negligible amounts of free oxygen, anodic reactions do not take place and the corrosion cell does not form. Therefore, no loss of material due to corrosion takes place and the aging effect is none.

9. The cooling water channel is integral to the seal housing. For the Leakage Boundary intended function, only the indoor air external environment is considered.
10. The cooling water channel is integral to the bearing housing. For the Heat Transfer intended function, only the lube oil external environment is considered. For the Pressure Boundary intended function, both the lube oil and indoor air external environments are considered. For the Leakage Boundary intended function, only the indoor air external environment is considered.
11. The cooling water channel is integral to the pump pedestal.
12. The Reactor Building Closed Cooling Water Heat Exchangers are evaluated with the Service Water System.

Table 3.3.2.1.30
Reactor Building Floor and Equipment Drains
Summary of Aging Management Evaluation

Table 3.3.2.1.30 Reactor Building Floor and Equipment Drains

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
		Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-2 (SP-51)	3.4.1-6	E
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-1 (SP-52)	3.4.1-11	E

Table 3.3.2.1.30 Reactor Building Floor and Equipment Drains (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Carbon and low alloy steel	Concrete (External)	None	None	VII.J-24 (AP-3)	3.3.1-78	A
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.C1-18 (A-32)	3.3.1-63	E, 1
		Cast Iron	Concrete (External)	None	None	VII.J-24 (AP-3)	3.3.1-78	A
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.C1-18 (A-32)	3.3.1-63	E, 1
					Selective Leaching of Materials (B.1.25)	VII.C1-9 (A-51)	3.3.1-67	A
		Stainless Steel	Concrete (External)	None	None	VII.J-19 (AP-19)	3.3.1-78	A
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.C3-8 (A-53)	3.3.1-61	E, 1

Table 3.3.2.1.30 Reactor Building Floor and Equipment Drains (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pump Casing (RBEDT pump)	Leakage Boundary	Cast Iron	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-2 (SP-51)	3.4.1-6	E
					Selective Leaching of Materials (B.1.25)	VII.C1-9 (A-51)	3.3.1-67	A
Tanks (RBEDT)	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-2 (SP-51)	3.4.1-6	E
Valve Body	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-2 (SP-51)	3.4.1-6	E
		Cast Iron	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-2 (SP-51)	3.4.1-6	E
					Selective Leaching of Materials (B.1.25)	VII.C1-9 (A-51)	3.3.1-67	A

Table 3.3.2.1.30 Reactor Building Floor and Equipment Drains (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.C1-18 (A-32)	3.3.1-63	E, 1
		Cast Iron	Concrete (External)	None	None	VII.J-24 (AP-3)	3.3.1-78	A
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.C1-18 (A-32)	3.3.1-63	E, 1
					Selective Leaching of Materials (B.1.25)	VII.C1-9 (A-51)	3.3.1-67	A

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The One-Time Inspection program confirms the absence of aging effects in pooled or potentially stagnant flow areas of drain piping and piping elements.

Table 3.3.2.1.31
Reactor Building Ventilation System
Summary of Aging Management Evaluation

Table 3.3.2.1.31 Reactor Building Ventilation System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Aluminum	Indoor Air (External)	None	None			F, 5
		Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-4 (AP-27)	3.3.1-35	E, 3
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-1 (AP-28)	3.3.1-36	E, 3
		Stainless Steel	Indoor Air (External)	None	None			G, 5
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	A
Closure bolting (Containment Isolation Components)	Mechanical Closure	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B, 2
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	E, 2
Damper housing	Pressure Boundary	Aluminum	Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	C

Table 3.3.2.1.31 Reactor Building Ventilation System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Damper housing	Pressure Boundary	Aluminum	Indoor Air (Internal)	None	None	V.F-2 (EP-3)	3.2.1-32	C, 6
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
		Galvanized Steel	Concrete (External)	None	None			G, 1
			Indoor Air (External)	None	None	VII.J-8 (AP-13)	3.3.1-74	C
			Indoor Air (Internal)	None	None	VII.J-8 (AP-13)	3.3.1-74	C, 6
Door Seal	Pressure Boundary	Elastomer	Indoor Air (External)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F3-7 (A-36)	3.3.1-10	E
				Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F3-8 (A-73)	3.3.1-28	E
			Indoor Air (Internal)	Change in Material Properties	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F3-10 (A-17)	3.3.1-10	E
				Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F3-9 (A-18)	3.3.1-28	E
Ductwork	Pressure Boundary	Aluminum	Concrete (External)	None	None			F, 1

Table 3.3.2.1.31 Reactor Building Ventilation System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Ductwork	Pressure Boundary	Aluminum	Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	C
			Indoor Air (Internal)	None	None	V.F-2 (EP-3)	3.2.1-32	C, 6
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
		Galvanized Steel	Indoor Air (External)	None	None	VII.J-8 (AP-13)	3.3.1-74	C
			Indoor Air (Internal)	None	None	VII.J-8 (AP-13)	3.3.1-74	C, 6
Piping and fittings	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F3-1 (A-10)	3.3.1-16	E
			Indoor Air (Internal)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.F3-6 (A-11)	3.3.1-16	E, 6
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Indoor Air (Internal)	None	None	VII.J-17 (AP-17)	3.3.1-76	A, 6
Piping and fittings (Primary Containment Isolation Valves)	Pressure Boundary	Carbon and low alloy steel	Containment Atmosphere (Internal)	None	None	VII.F3-6 (A-11)	3.3.1-16	I, 4

Table 3.3.2.1.31 Reactor Building Ventilation System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings (Primary Containment Isolation Valves)	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Indoor Air (Internal)	Loss of Material	10 CFR Part 50, Appendix J (B.1.29)	VII.F3-6 (A-11)	3.3.1-16	E, 6
					One-Time Inspection (B.1.24)	VII.F3-6 (A-11)	3.3.1-16	E, 6
Sensor Element (Temperature)	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	C
			Indoor Air (Internal)	None	None	VII.J-17 (AP-17)	3.3.1-76	C, 6
Valve Body	Pressure Boundary	Cast Iron	Indoor Air (External)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.I-7 (A-77)	3.3.1-12	E
			Indoor Air (Internal)	Loss of Material	Periodic Inspection of Ventilation Systems (B.2.4)	VII.I-7 (A-77)	3.3.1-12	E, 6
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Indoor Air (Internal)	None	None	VII.J-17 (AP-17)	3.3.1-76	A, 6

Table 3.3.2.1.31 Reactor Building Ventilation System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body (Primary Containment Isolation)	Pressure Boundary	Carbon and low alloy steel	Containment Atmosphere (Internal)	None	None	VII.F3-6 (A-11)	3.3.1-16	I, 4
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
		Cast Iron	Containment Atmosphere (Internal)	None	None	VII.F3-6 (A-11)	3.3.1-16	I, 4
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The aging effect for galvanized steel and aluminum encased in concrete is none. This is consistent with industry guidance.
2. The Bolting Integrity program adequately manages the aging effects of the bolting used with Primary Containment components.
3. Ventilation system duct bolting is similar to structural bolting in that it provides structural support for ventilation system assemblies, which is functionally different from piping system pressure retaining closure bolting. The Bolting Integrity program does not provide for long-term condition monitoring inspections of ventilation duct bolting. Therefore, the Structures Monitoring Program is appropriate to detect and manage the aging effects of ventilation system duct bolting by periodic visual inspection.
4. Based on past precedence (NUREG-1796, Dresden and Quad Cities SER, paragraph 3.1.2.4.1), the Staff concluded that the loss of material due to corrosion is not considered a credible aging effect for carbon steel components in a containment nitrogen environment because of negligible amounts of free oxygen (less than 4 percent by volume during normal operation). Both oxygen and moisture must be present for general corrosion to occur because oxygen alone or water free of dissolved oxygen (high humidity in a nitrogen atmosphere) does not corrode carbon steel to any practical extent. The staff found the applicant’s identification of no loss of material for the carbon steel components exposed to a containment nitrogen environment acceptable because, with the negligible amounts of free oxygen, anodic reactions do not take place and the corrosion cell does not form. Therefore, no loss of material due to corrosion takes place and the aging effect is none.
5. The aging effects for stainless steel ventilation closure bolting in an indoor environment is none. This is consistent with industry guidance.

6. Ventilation system components in the scope of license renewal at Oyster Creek are not subject to internal condensation. A review of the maintenance history of these components has not identified degradation due to the presence of internal condensation. Preventive maintenance activities and system manager walkdowns have not identified or reported internal condensation or resulting internal ventilation system degradation in these components. Therefore, the internal environment for ventilation system components in the scope of license renewal is "Indoor Air (Internal)."

Table 3.3.2.1.32
Reactor Water Cleanup System
Summary of Aging Management Evaluation

Table 3.3.2.1.32 Reactor Water Cleanup System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Containment Atmosphere (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 1
			Indoor Air (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	VII.E3-19 (A-34)	3.3.1-2	C, 10
						IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
						VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 1

Table 3.3.2.1.32 Reactor Water Cleanup System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Indoor Air (External)	Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
		Carbon and low alloy steel	Containment Atmosphere (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 1
			Indoor Air (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	VII.E3-19 (A-34)	3.3.1-2	C, 10
						IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
						VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 1
						VII.I-5 (AP-26)	3.3.1-35	B

Table 3.3.2.1.32 Reactor Water Cleanup System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Coolers (Cleanup Pre-coat Pump)	Leakage Boundary	Stainless Steel (Tube Side Components)	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-3 (A-70)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.A4-3 (A-70)	3.3.1-22	B
Coolers (Cleanup Recirc. Pumps Lube Oil)	Leakage Boundary	Carbon Steel (Shell Side Components)	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.H2-3 (AP-39)	3.3.1-21	E
					One-Time Inspection (B.1.24)	VII.H2-3 (AP-39)	3.3.1-21	E
Demineralizer (Cleanup Demineralizer)	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E3-17 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.E3-17 (AP-57)	3.3.1-23	E
Filter Housing (Cleanup Filter)	Leakage Boundary	Carbon Steel (with elastomer lining)	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E

Table 3.3.2.1.32 Reactor Water Cleanup System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Filter Housing (Cleanup Filter)	Leakage Boundary	Carbon Steel (with elastomer lining)	Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-12 (A-40)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.A4-12 (A-40)	3.3.1-22	B
Flow Element	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E3-17 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.E3-17 (AP-57)	3.3.1-23	E
Gauge Snubber	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E3-17 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.E3-17 (AP-57)	3.3.1-23	E
Heat Exchangers (Cleanup Non-Regenerative)	Leakage Boundary	Stainless Steel (Tube Side Components)	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Table 3.3.2.1.32 Reactor Water Cleanup System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchangers (Cleanup Non-Regenerative)	Leakage Boundary	Stainless Steel (Tube Side Components)	Treated Water (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	VII.E3-4 (A-71)	3.3.1-6	E
					Water Chemistry (B.1.2)	VII.E3-4 (A-71)	3.3.1-6	E
				Loss of Material	One-Time Inspection (B.1.24)	VII.A4-3 (A-70)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.A4-3 (A-70)	3.3.1-22	B
Heat Exchangers (Cleanup Regenerative)	Leakage Boundary	Stainless Steel (Shell Side Components)	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	VII.E3-20 (A-85)	3.3.1-6	E
					Water Chemistry (B.1.2)	VII.E3-20 (A-85)	3.3.1-6	E
				Loss of Material	One-Time Inspection (B.1.24)	VIII.E-2 (S-21)	3.4.1-10	A

Table 3.3.2.1.32 Reactor Water Cleanup System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchangers (Cleanup Regenerative)	Leakage Boundary	Stainless Steel (Shell Side Components)	Treated Water (Internal)	Loss of Material	Water Chemistry (B.1.2)	VIII.E-2 (S-21)	3.4.1-10	B
		Stainless Steel (Tube Side Components)	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	VII.E3-20 (A-85)	3.3.1-6	E
					Water Chemistry (B.1.2)	VII.E3-20 (A-85)	3.3.1-6	E
				Loss of Material	One-Time Inspection (B.1.24)	VII.A4-3 (A-70)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.A4-3 (A-70)	3.3.1-22	B
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B

Table 3.3.2.1.32 Reactor Water Cleanup System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Leakage Boundary	Copper Alloy	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.H2-10 (AP-47)	3.3.1-24	E
					One-Time Inspection (B.1.24)	VII.H2-10 (AP-47)	3.3.1-24	E
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water (Internal)	Cracking Initiation and Growth	BWR Reactor Water Cleanup System (B.1.18)	VII.E3-18 (A-60)	3.3.1-31	B
					One-Time Inspection (B.1.24)	VII.E3-18 (A-60)	3.3.1-31	E, 2
					Water Chemistry (B.1.2)	VII.E3-18 (A-60)	3.3.1-31	E, 2
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	VII.E3-16 (A-62)	3.3.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	VII.E3-17 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.E3-17 (AP-57)	3.3.1-23	E

Table 3.3.2.1.32 Reactor Water Cleanup System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water <140F (Internal)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	VII.E3-16 (A-62)	3.3.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	VII.E3-17 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.E3-17 (AP-57)	3.3.1-23	E
	Pressure Boundary	Carbon and low alloy steel	Containment Atmosphere (External)	None	None	VII.I-7 (A-77)	3.3.1-12	I, 8
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Indoor Air (Internal)	Loss of Material	10 CFR Part 50, Appendix J (B.1.29)	VII.F3-6 (A-11)	3.3.1-16	E, 3
					One-Time Inspection (B.1.24)	VII.F3-6 (A-11)	3.3.1-16	E, 3
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-2 (R-55)	3.1.1-21	B
					One-Time Inspection (B.1.24)	IV.C1-2 (R-55)	3.1.1-21	A
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A

Table 3.3.2.1.32 Reactor Water Cleanup System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Carbon and low alloy steel	Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A, 9
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B, 9
				Not Applicable	None	IV.C1-1 (R-03)	3.1.1-9	I, 11
			Treated Water < 140F (External)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A, 6
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B, 6
		Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Indoor Air (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-1 (R-03)	3.1.1-9	B
						IV.C1-2 (R-55)	3.1.1-21	B

Table 3.3.2.1.32 Reactor Water Cleanup System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-9 (R-22)	3.1.1-32	E, 4
					BWR Stress Corrosion Cracking (B.1.7)	IV.C1-9 (R-22)	3.1.1-32	B
					One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	A
						IV.C1-2 (R-55)	3.1.1-21	A
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	B
						IV.C1-9 (R-22)	3.1.1-32	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)		3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	VII.E3-17 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.E3-17 (AP-57)	3.3.1-23	E
Pump Casing (Cleanup Auxiliary Pump)	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Table 3.3.2.1.32 Reactor Water Cleanup System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pump Casing (Cleanup Auxiliary Pump)	Leakage Boundary	Stainless Steel	Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E3-17 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.E3-17 (AP-57)	3.3.1-23	E
Pump Casing (Cleanup Filter Aid Pumps)	Leakage Boundary	Cast Iron	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Selective Leaching of Materials (B.1.25)	VII.E3-14 (AP-31)	3.3.1-67	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
Pump Casing (Cleanup Filter Precoat Pump)	Leakage Boundary	Cast Iron	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Selective Leaching of Materials (B.1.25)	VII.E3-14 (AP-31)	3.3.1-67	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B

Table 3.3.2.1.32 Reactor Water Cleanup System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pump Casing (Cleanup Recirc Pumps)	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E3-17 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.E3-17 (AP-57)	3.3.1-23	E
Pump Casing (Cleanup Sludge Pump)	Leakage Boundary	Cast Iron	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Selective Leaching of Materials (B.1.25)	VII.E3-14 (AP-31)	3.3.1-67	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
Restricting Orifice	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E3-17 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.E3-17 (AP-57)	3.3.1-23	E

Table 3.3.2.1.32 Reactor Water Cleanup System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Sensor Element	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E3-17 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.E3-17 (AP-57)	3.3.1-23	E
Sight Glasses	Leakage Boundary	Carbon and low alloy steel (Body)	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
		Glass (Window)	Indoor Air (External)	None	None	VII.J-10 (AP-14)	3.3.1-75	A
			Treated Water <140F (Internal)	None	None			G, 5
		Stainless Steel (Body)	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E3-17 (AP-57)	3.3.1-23	E

Table 3.3.2.1.32 Reactor Water Cleanup System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Sight Glasses	Leakage Boundary	Stainless Steel (Body)	Treated Water <140F (Internal)	Loss of Material	Water Chemistry (B.1.2)	VII.E3-17 (AP-57)	3.3.1-23	E
Strainer Body	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E3-17 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.E3-17 (AP-57)	3.3.1-23	E
Tanks (Cleanup Backwash Tank)	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E3-17 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.E3-17 (AP-57)	3.3.1-23	E

Table 3.3.2.1.32 Reactor Water Cleanup System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Tanks (Cleanup Filter Aid Mix Tank)	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
Tanks (Cleanup Filter and Precoat Tank)	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
Tanks (Cleanup Filter Sludge Receiver)	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
Tanks (Cleanup Recirc. Pump Surge Tank)	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Table 3.3.2.1.32 Reactor Water Cleanup System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Tanks (Cleanup Recirc. Pump Surge Tank)	Leakage Boundary	Stainless Steel	Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E3-17 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.E3-17 (AP-57)	3.3.1-23	E
Tanks (Cleanup Recirc. Pumps Lube Oil)	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.C2-13 (AP-30)	3.3.1-16	E
					One-Time Inspection (B.1.24)	VII.C2-13 (AP-30)	3.3.1-16	E
Thermowell	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E3-17 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.E3-17 (AP-57)	3.3.1-23	E
Valve Body	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A

Table 3.3.2.1.32 Reactor Water Cleanup System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Leakage Boundary	Carbon and low alloy steel	Treated Water <140F (Internal)	Loss of Material	Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
		CASS	Indoor Air (External)	None	None	VII.J-3 (AP-7)	3.3.1-76	A
			Treated Water >482F (Internal)	Loss of Fracture Toughness	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-4 (R-08)	3.1.1-47	B, 12
				Loss of Material	One-Time Inspection (B.1.24)	VII.E3-17 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.E3-17 (AP-57)	3.3.1-23	E
		Cast Iron	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Selective Leaching of Materials (B.1.25)	VII.E3-14 (AP-31)	3.3.1-67	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
		Copper Alloy	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A

Table 3.3.2.1.32 Reactor Water Cleanup System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Leakage Boundary	Copper Alloy	Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.K-1 (AP-70)	3.3.1-23	E
					Selective Leaching of Materials (B.1.25)	VII.E3-13 (AP-32)	3.3.1-65	A
					Water Chemistry (B.1.2)	VII.K-1 (AP-70)	3.3.1-23	E
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E3-17 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.E3-17 (AP-57)	3.3.1-23	E
	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Indoor Air (Internal)	Loss of Material	10 CFR Part 50, Appendix J (B.1.29)	VII.F3-6 (A-11)	3.3.1-16	E, 3
					One-Time Inspection (B.1.24)	VII.F3-6 (A-11)	3.3.1-16	E, 3
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A

Table 3.3.2.1.32 Reactor Water Cleanup System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Carbon and low alloy steel	Treated Water <140F (Internal)	Loss of Material	Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
		CASS	Containment Atmosphere (External)	None	None	IV.E-1 (RP-02)	3.1.1-71	A
			Indoor Air (External)	None	None	IV.E-1 (RP-02)	3.1.1-71	A
			Treated Water >482F (Internal)	Cracking Initiation and Growth	BWR Stress Corrosion Cracking (B.1.7)	IV.C1-10 (R-20)	3.1.1-32	B
					One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	E, 7, 14
						IV.C1-2 (R-55)	3.1.1-21	E, 13, 14
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	E, 7, 14
						IV.C1-10 (R-20)	3.1.1-32	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Fracture Toughness	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-4 (R-08)	3.1.1-47	B

Table 3.3.2.1.32 Reactor Water Cleanup System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	CASS	Treated Water >482F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E3-17 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.E3-17 (AP-57)	3.3.1-23	E
		Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Indoor Air (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Treated Water (Internal)	Cracking Initiation and Growth	BWR Stress Corrosion Cracking (B.1.7)	IV.C1-9 (R-22)	3.1.1-32	B
					One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	E, 7, 14
						IV.C1-2 (R-55)	3.1.1-21	E, 13, 14
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	E, 7, 14
						IV.C1-9 (R-22)	3.1.1-32	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A

Table 3.3.2.1.32 Reactor Water Cleanup System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E3-17 (AP-57)	3.3.1-23	E
					Water Chemistry (B.1.2)	VII.E3-17 (AP-57)	3.3.1-23	E

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. Line item IV.C1-12 (R-27) for loss of preload for RCPB closure bolting does not apply since the A 193 B7 alloy steel closure bolting is not high-strength. Line item V.E-5 (EP-24) has been applied to the loss of preload aging effect for RCPB closure bolting.
2. The BWR Reactor Water Cleanup System program does not apply to piping and piping welds <4" nominal pipe size. Water Chemistry and the One-Time Inspection programs will be used to confirm that cracking/stress corrosion cracking/intergranular stress corrosion cracking is not occuring in piping and piping welds <4" nominal pipe size.
3. The internal environment for the outlet of the system relief valve and for the non-submerged portion of the relief valve discharge piping is indoor air since these components are vented and drained from within the Reactor Building.
4. The program for ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD is applied to this component in addition to the NUREG-1801 specified programs.
5. Glass has no aging effects in a treated water environment based on industry standards.
6. The open ended demineralizer line relief valve discharge pipe is submerged in the Suppression Pool.
7. The applicable program for the aging effect of cracking as identified in line item IV.C1-1 (R-03) for class 1 piping, fittings and branch connections < NPS 4 has been applied to valves < NPS 4.
8. Based on past precedence (NUREG-1796, Dresden and Quad Cities SER, paragraph 3.1.2.4.1), the Staff concluded that the loss of material due

to corrosion is not considered a credible aging effect for carbon steel components in a containment nitrogen environment because of negligible amounts of free oxygen (less than 4 percent by volume during normal operation). Both oxygen and moisture must be present for general corrosion to occur because oxygen alone or water free of dissolved oxygen (high humidity in a nitrogen atmosphere) does not corrode carbon steel to any practical extent. The staff found the applicant's identification of no loss of material for the carbon steel components exposed to a containment nitrogen environment acceptable because, with the negligible amounts of free oxygen, anodic reactions do not take place and the corrosion cell does not form. Therefore, no loss of material due to corrosion takes place and the aging effect is none.

9. The RWCU carbon steel bottom head drain line is not susceptible to FAC. The wear factor from temperature is a bell curve that peaks around 300 F to 325 F. At the almost 500 F that this line sees, the oxide layer is more stable. Additionally, for this 2" line, operating flow of 6 GPM (ref. calc. No. C-1302-215-5360-004) provides a velocity of ~1 ft/sec. Flow rates less than 6 ft/sec do not need to be considered for flow-accelerated corrosion.
10. The aging effect of cumulative fatigue damage has been applied to non-Class 1 closure bolting. It does not apply to the Cleanup Aux. Pump closure bolting since this pump is isolated during power operations. It also does not apply to the Cleanup Recirc. Pumps, or, to any other system component that is located in the low pressure/low temperature portion of the Reactor Water Cleanup System.
11. SCC and IGSCC of carbon and low alloy steel are not considered applicable aging mechanisms in a treated water environment per EPRI Mechanical Tools Appendix A.
12. The aging effect of loss of fracture toughness (IV.C1-4 for Class 1 valve bodies) has been applied to the non-Class 1 cast stainless steel valve bodies in the Reactor Water Cleanup System exposed to treated water >482F.
13. The applicable program for the aging effect of cracking as identified in line item IV.C1-2 (R-55) for class 1 piping, fittings and branch connections < NPS 4 has been applied to valves < NPS 4.
14. ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD does not apply to valve bodies.

Table 3.3.2.1.33
Roof Drains and Overboard Discharge
Summary of Aging Management Evaluation

Table 3.3.2.1.33 Roof Drains and Overboard Discharge

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
		Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
			Soil (External)	Loss of Material	Bolting Integrity (B.1.12)			G, 1
				Loss Of Preload	Bolting Integrity (B.1.12)			G, 1
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-2 (SP-51)	3.4.1-6	E

Table 3.3.2.1.33 Roof Drains and Overboard Discharge (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Bronze	Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-7 (A-44)	3.3.1-57	A, 2, 3
			Soil (External)	Loss of Material	Buried Piping Inspection (B.1.26)			G, 2, 4
		Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E, 5
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VIII.J-2 (SP-51)	3.4.1-6	E, 5
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-18 (A-32)	3.3.1-63	A, 3
		Carbon and low alloy steel (w/coating or wrapping)	Soil (External)	Loss of Material	Buried Piping Inspection (B.1.26)	VII.C1-19 (A-01)	3.3.1-18	B, 6
		Polymers	Raw Water - Salt Water (Internal)	None	None			F, 3, 7

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The aging effects for closure bolting in a buried (soil) external environment include loss of material and loss of preload. External inspections of buried bolting will occur in accordance with the frequency outlined in the Buried Piping Inspection program.
2. Material is bronze ASTM designation B61 which contains < 15% Zn, therefore, the aging mechanism of selective leaching does not apply.
3. The aging effects associated with the continuous Raw Water - Salt Water internal environment (ESW/SW) bound the aging effects associated with intermittent Raw Water - Fresh Water effluents (building sumps, drains, and storm water effluents) which are released through the Overboard Discharge Line.
4. The aging effect for bronze in a buried (soil) external environment includes loss of material (reference: EPRI Mechanical Tools Appendix E).
5. Applies to the portion of the Office Building roof drain system relied upon for drainage of Fire Protection System deluge spray from the New Cable Spreading Room floor drains.
6. Exterior coating or wrapping is applied to all carbon steel piping and fittings that are exposed to a soil (external) environment.
7. Except for a 6' spool piece, the 30" Overboard Discharge line has a polyester resin liner (Insituform) on the internal diameter. Polyester resin is chemically resistant, with superior water resistance, and has no aging effects for the identified environment based on industry experience.

Table 3.3.2.1.34
Sanitary Waste System
Summary of Aging Management Evaluation

Table 3.3.2.1.34 Sanitary Waste System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Leakage Boundary	Cast Iron	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Fresh Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.C3-10 (A-31)	3.3.1-62	E, 2
					Selective Leaching of Materials (B.1.25)	VII.C1-12 (AP-29)	3.3.1-67	A
		Polyvinyl Chloride (PVC, CPVC)	Indoor Air (External)	None	None			F, 1
			Raw Water – Fresh Water (Internal)	None	None			F, 1

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. Polyvinyl Chloride (PVC, CPVC) has no aging effects for identified environment based on industry standards.
2. NUREG-1801 only addresses selective leaching aging mechanism for this component and environment. VII.C3-10 (A-31) uses Aging Management Program Open-Cycle Cooling Water System however, this system has a Raw Water - Fresh Water environment. One-Time Inspection program will be used to confirm loss of material due to other potential mechanisms.

Table 3.3.2.1.35
Service Water System
Summary of Aging Management Evaluation

Table 3.3.2.1.35 Service Water System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Outdoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-1 (AP-28)	3.3.1-36	B
				Loss Of Preload	Bolting Integrity (B.1.12)			H, 1
			Raw Water – Salt Water (External)	Loss of Material	Bolting Integrity (B.1.12)			G, 13
				Loss Of Preload	Bolting Integrity (B.1.12)			G, 13
		Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
			Outdoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-1 (AP-28)	3.3.1-36	B
				Loss Of Preload	Bolting Integrity (B.1.12)			H, 1

Table 3.3.2.1.35 Service Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Raw Water – Salt Water (External)	Loss of Material	Bolting Integrity (B.1.12)			G, 13
				Loss Of Preload	Bolting Integrity (B.1.12)			G, 13
			Soil (External)	Loss of Material	Bolting Integrity (B.1.12)			G, 3
				Loss Of Preload	Bolting Integrity (B.1.12)			G, 3
		Stainless Steel	Outdoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)			G, 2
				Loss Of Preload	Bolting Integrity (B.1.12)			G, 2
Eductor	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A
Expansion Joint	Pressure Boundary	Elastomer	Outdoor Air (External)	Change in Material Properties	Structures Monitoring Program (B.1.31)	VII.G-2 (A-20)	3.3.1-46	E, 9
			Raw Water – Salt Water (Internal)	Change in Material Properties	Periodic Inspection Program (B.2.5)			G, 9

Table 3.3.2.1.35 Service Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flow Element	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A
Gauge Snubber	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A
Heat Exchangers (RBCCW)	Heat Transfer	Titanium (Tubes)	Closed Cooling Water (External)	None	None			F, 4
			Raw Water – Salt Water (Internal)	Reduction of Heat Transfer	Open-Cycle Cooling Water System (B.1.13)			F, 4
	Pressure Boundary	Carbon Steel (Shell Side Components)	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-1 (A-63)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
		Carbon Steel (Tube Side Components)	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-3 (A-64)	3.3.1-63	A

Table 3.3.2.1.35 Service Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchangers (RBCCW)	Pressure Boundary	Titanium (Tube Sheet)	Raw Water – Salt Water (External)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)			F, 4, 10
		Titanium (Tubes)	Closed Cooling Water (External)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)			F, 4
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)			F, 4
Heat Exchangers (TBCCW)	Leakage Boundary	Carbon and low alloy steel (Tube Side Components)	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-3 (A-64)	3.3.1-63	A
Piping and fittings	Leakage Boundary	Brass	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-7 (A-44)	3.3.1-57	A, 12
					Selective Leaching of Materials (B.1.25)	VII.C1-8 (A-47)	3.3.1-65	A, 12
		Bronze	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A

Table 3.3.2.1.35 Service Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Leakage Boundary	Bronze	Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-7 (A-44)	3.3.1-57	A, 11
		Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-18 (A-32)	3.3.1-63	A
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A
	Pressure Boundary	Brass	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)			G, 5
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-7 (A-44)	3.3.1-57	A, 12
					Selective Leaching of Materials (B.1.25)	VII.C1-8 (A-47)	3.3.1-65	A, 12
		Bronze	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A

Table 3.3.2.1.35 Service Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Bronze	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)			G, 5
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-7 (A-44)	3.3.1-57	A, 11
		Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.G-20 (AP-30)	3.3.1-16	E
					One-Time Inspection (B.1.24)	VII.G-20 (AP-30)	3.3.1-16	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-8 (A-78)	3.3.1-12	E
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-18 (A-32)	3.3.1-63	A
		Carbon and low alloy steel (w/coating or wrapping)	Soil (External)	Loss of Material	Buried Piping Inspection (B.1.26)	VII.C1-19 (A-01)	3.3.1-18	B, 14
		Copper Alloy	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.C1-6 (AP-47)	3.3.1-24	E
					One-Time Inspection (B.1.24)	VII.C1-6 (AP-47)	3.3.1-24	E

Table 3.3.2.1.35 Service Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Copper Alloy	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)			G, 5
		Polyvinyl Chloride (PVC, CPVC)	Outdoor Air (External)	None	None			F, 6
			Raw Water – Salt Water (Internal)	None	None			F, 6
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Lubricating Oil (Internal)	None	None	V.F-18 (EP-21)	3.2.1-34	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A
Pump Casing (Rad Monitor Sample Pump)	Pressure Boundary	Stainless Steel	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A
Pump Casing (Service Water Pumps)	Pressure Boundary	Bronze (Bowl Assembly)	Raw Water – Salt Water (External)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-7 (A-44)	3.3.1-57	A

Table 3.3.2.1.35 Service Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pump Casing (Service Water Pumps)	Pressure Boundary	Bronze (Bowl Assembly)	Raw Water – Salt Water (External)	Loss of Material	Selective Leaching of Materials (B.1.25)	VII.C1-8 (A-47)	3.3.1-65	A
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-7 (A-44)	3.3.1-57	A
					Selective Leaching of Materials (B.1.25)	VII.C1-8 (A-47)	3.3.1-65	A
		Cast Iron (Discharge Head and Bowl Assembly)	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-8 (A-78)	3.3.1-12	E
			Raw Water – Salt Water (External)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-18 (A-32)	3.3.1-63	A
					Selective Leaching of Materials (B.1.25)	VII.C1-9 (A-51)	3.3.1-67	A
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-18 (A-32)	3.3.1-63	A
					Selective Leaching of Materials (B.1.25)	VII.C1-9 (A-51)	3.3.1-67	A
		Stainless Steel (Column Pipe)	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C

Table 3.3.2.1.35 Service Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pump Casing (Service Water Pumps)	Pressure Boundary	Stainless Steel (Column Pipe)	Raw Water – Salt Water (External)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A
Restricting Orifice	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A
	Throttle	Stainless Steel	Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A
Rotameter	Pressure Boundary	Stainless Steel	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A
Sample Chamber	Pressure Boundary	Titanium	Outdoor Air (External)	None	None			F, 4
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)			F, 4
Sight Glasses	Leakage Boundary	Copper Alloy (Body)	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A

Table 3.3.2.1.35 Service Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Sight Glasses	Leakage Boundary	Copper Alloy (Body)	Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-7 (A-44)	3.3.1-57	A
					Selective Leaching of Materials (B.1.25)	VII.C1-8 (A-47)	3.3.1-65	A
		Glass (Window)	Indoor Air (External)	None	None	VII.J-10 (AP-14)	3.3.1-75	A
			Raw Water – Salt Water (Internal)	None	None			G, 7
		Stainless Steel (Body)	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A
Strainer	Filter (Rad Monitor Duplex Strainer)	Polyvinyl Chloride (PVC, CPVC)	Raw Water – Salt Water (External)	None	None			F, 6
Strainer Body	Leakage Boundary	Copper Alloy	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-7 (A-44)	3.3.1-57	A
					Selective Leaching of Materials (B.1.25)	VII.C1-8 (A-47)	3.3.1-65	A

Table 3.3.2.1.35 Service Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Strainer Body	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A
	Pressure Boundary (Rad Monitor Duplex Strainer)	Polyvinyl Chloride (PVC, CPVC)	Outdoor Air (External)	None	None			F, 6
			Raw Water – Salt Water (Internal)	None	None			F, 6
Tanks (Service Water Pump Oil Reservoir)	Pressure Boundary	Aluminum	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)			G, 8
					One-Time Inspection (B.1.24)			G, 8
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
Thermowell	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-18 (A-32)	3.3.1-63	A
	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Table 3.3.2.1.35 Service Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Thermowell	Pressure Boundary	Stainless Steel	Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A
Valve Body	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-18 (A-32)	3.3.1-63	A
		Copper Alloy	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-7 (A-44)	3.3.1-57	A
					Selective Leaching of Materials (B.1.25)	VII.C1-8 (A-47)	3.3.1-65	A
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A
	Pressure Boundary	Aluminum	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)			G, 8
					One-Time Inspection (B.1.24)			G, 8

Table 3.3.2.1.35 Service Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Aluminum	Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
		Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-8 (A-78)	3.3.1-12	E
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-18 (A-32)	3.3.1-63	A
			Soil (External)	Loss of Material	Buried Piping Inspection (B.1.26)	VII.C1-19 (A-01)	3.3.1-18	B
		Cast Iron	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-8 (A-78)	3.3.1-12	E
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-18 (A-32)	3.3.1-63	A
					Selective Leaching of Materials (B.1.25)	VII.C1-9 (A-51)	3.3.1-67	A
		Copper Alloy	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A

Table 3.3.2.1.35 Service Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Copper Alloy	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Monitoring Activities (B.2.2)	VII.C1-6 (AP-47)	3.3.1-24	E
					One-Time Inspection (B.1.24)	VII.C1-6 (AP-47)	3.3.1-24	E
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)			G, 5
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-7 (A-44)	3.3.1-57	A
					Selective Leaching of Materials (B.1.25)	VII.C1-8 (A-47)	3.3.1-65	A
		Polyvinyl Chloride (PVC, CPVC)	Outdoor Air (External)	None	None			F, 6
			Raw Water – Salt Water (Internal)	None	None			F, 6
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	III.B4-6 (TP-6)	3.5.1-33	C
			Raw Water – Salt Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.1.13)	VII.C1-15 (A-54)	3.3.1-58	A

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The aging effects for carbon and alloy steel closure bolting in an outdoor air (external) environment also include loss of preload.
2. The aging effects for stainless steel closure bolting in an outdoor air (external) environment include loss of material and loss of preload.
3. The aging effects for carbon and alloy steel closure bolting in a soil (external) environment include loss of material and loss of preload. External inspections of buried bolting will occur in accordance with the frequency outlined in the Buried Piping Inspection program.
4. Titanium not addressed in NUREG-1801. Aging effects are based on industry standards (EPRI Mechanical Tools Appendices B, E, and G).
5. The aging effect for copper or copper alloy (brass/bronze) in an outdoor air (external) environment is loss of material based on industry standards (EPRI Mechanical Tools Appendix E).
6. Polyvinyl Chloride (PVC, CPVC) has no aging effects for identified environment based on industry standards. Polyvinyl Chloride components with an outdoor air (external) environment are insulated and are not subject to aging effects from UV radiation.
7. Glass has no aging effects in this environment based on industry standards.
8. The aging effect for aluminum with a lubricating oil (internal) environment is based on industry standards (EPRI Mechanical Tools Appendix C) and assumes the potential for water pooling/separation in the oil reservoir.
9. The Structures Monitoring Program includes external surface inspections but does not include internal surface inspections. The Periodic Inspection Program will inspect this component for internal aging effects.

10. Tube sheets are carbon steel with titanium clad on tube side surface. The carbon steel side of the tube sheets are evaluated with the shell side components.
11. Material is bronze ASTM designation B61 which contains < 15% Zn, therefore, the aging mechanism of selective leaching does not apply.
12. Material is red brass ASTM designation B43 which contains > 15% Zn, therefore, the aging mechanism of selective leaching applies.
13. The aging effects for carbon and alloy steel closure bolting in a raw water - salt water (external) environment include loss of material and loss of preload.
14. Exterior coating or wrapping is applied to all carbon steel piping and fittings that are exposed to a soil (external) environment.

Table 3.3.2.1.36
Shutdown Cooling System
Summary of Aging Management Evaluation

Table 3.3.2.1.36 Shutdown Cooling System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Indoor Air (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
						V.E-4 (EP-25)	3.2.1-25	B
				Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B
						V.E-5 (EP-24)	3.2.1-25	B, 8
		Carbon and low alloy steel	Indoor Air (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
						V.E-4 (EP-25)	3.2.1-25	B

Table 3.3.2.1.36 Shutdown Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Indoor Air (External)	Loss Of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B
						V.E-5 (EP-24)	3.2.1-25	B, 8
		Stainless Steel	Containment Atmosphere (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C2-11 (R-18)	3.1.1-1	A, 7
				Loss Of Preload	Bolting Integrity (B.1.12)			G
Coolers (Shutdown Cooling Pumps)								14
Flow Element	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-2 (R-55)	3.1.1-21	B, 13
						IV.C1-2 (R-55)	3.1.1-21	E, 2, 11, 13
					One-Time Inspection (B.1.24)	IV.C1-2 (R-55)	3.1.1-21	A, 13

Table 3.3.2.1.36 Shutdown Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flow Element	Pressure Boundary	Carbon and low alloy steel	Treated Water (Internal)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
				Not Applicable	None	IV.C1-1 (R-03)	3.1.1-9	I, 2, 12, 13
		Stainless Steel	Indoor Air (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-1 (R-03)	3.1.1-9	B, 13
						IV.C1-2 (R-55)	3.1.1-21	B, 13
					One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	A, 13
						IV.C1-2 (R-55)	3.1.1-21	A, 13

Table 3.3.2.1.36 Shutdown Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flow Element	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking Initiation and Growth	Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	B, 13
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
Heat Exchangers (Shutdown Cooling)								15
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
	Pressure Boundary	Carbon and low alloy steel	Containment Atmosphere (External)	None	None	VII.I-7 (A-77)	3.3.1-12	I, 4
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E

Table 3.3.2.1.36 Shutdown Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Carbon and low alloy steel	Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-2 (R-55)	3.1.1-21	B
						IV.C1-2 (R-55)	3.1.1-21	E, 2, 11
					One-Time Inspection (B.1.24)	IV.C1-2 (R-55)	3.1.1-21	A
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
					TLAA, evaluated in accordance with 10 CFR 54.21(c)	VII.E4-18 (A-37)	3.3.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B, 9
				Not Applicable	None	IV.C1-1 (R-03)	3.1.1-9	I, 2, 12
		Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A

Table 3.3.2.1.36 Shutdown Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
						VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-1 (R-03)	3.1.1-9	B
						IV.C1-2 (R-55)	3.1.1-21	B
						IV.C1-9 (R-22)	3.1.1-32	E, 1
					BWR Stress Corrosion Cracking (B.1.7)	IV.C1-9 (R-22)	3.1.1-32	B
					One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	A
						IV.C1-2 (R-55)	3.1.1-21	A
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	B

Table 3.3.2.1.36 Shutdown Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking Initiation and Growth	Water Chemistry (B.1.2)	IV.C1-9 (R-22)	3.1.1-32	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
						VII.E4-14 (A-62)	3.3.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
Pump Casing	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
Restricting Orifice	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	VIII.E-25 (SP-19)	3.4.1-8	A

Table 3.3.2.1.36 Shutdown Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Restricting Orifice	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking Initiation and Growth	Water Chemistry (B.1.2)	VIII.E-25 (SP-19)	3.4.1-8	B
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
	Throttle	Stainless Steel	Treated Water (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	VIII.E-25 (SP-19)	3.4.1-8	A
					Water Chemistry (B.1.2)	VIII.E-25 (SP-19)	3.4.1-8	B
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
Thermowell	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B

Table 3.3.2.1.36 Shutdown Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	IV.C1-2 (R-55)	3.1.1-21	E, 5, 10
						IV.C1-2 (R-55)	3.1.1-21	E, 6, 10
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
				Not Applicable	None	IV.C1-1 (R-03)	3.1.1-9	I, 5, 6, 12

Table 3.3.2.1.36 Shutdown Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Indoor Air (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
						VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water (Internal)	Cracking Initiation and Growth	BWR Stress Corrosion Cracking (B.1.7)	IV.C1-9 (R-22)	3.1.1-32	B
					One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	E, 5, 10
						IV.C1-2 (R-55)	3.1.1-21	E, 5, 10
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	E, 5, 10
						IV.C1-9 (R-22)	3.1.1-32	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A

Table 3.3.2.1.36 Shutdown Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The program for ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD is applied in addition to the NUREG-1801 recommended programs for this item.
2. The Aging Management Programs recommended in NUREG-1801 for Class 1 carbon steel piping, fittings, and branch connections < 4 in. N.P.S. are also specified here for Class 1 piping, fittings, and branch connections >= 4 in. N.P.S.
3. The One-Time Inspection program is used for piping and elements <4 in. n.p.s., in lieu of the BWR Stress Corrosion Cracking program (used for piping and elements >= 4 in. n.p.s.).
4. Based on past precedence (NUREG-1796, Dresden and Quad Cities SER, paragraph 3.1.2.4.1), the Staff concluded that the loss of material due to corrosion is not considered a credible aging effect for carbon steel components in a containment nitrogen environment because of negligible amounts of free oxygen (less than 4 percent by volume during normal operation). Both oxygen and moisture must be present for general corrosion to occur because oxygen alone or water free of dissolved oxygen (high humidity in a nitrogen atmosphere) does not corrode carbon steel to any practical extent. The staff found the applicant's identification of no loss of material for the carbon steel components exposed to a containment nitrogen environment acceptable because, with the negligible amounts of free oxygen, anodic reactions do not take place and the corrosion cell does not form. Therefore, no loss of material due to corrosion takes place and the aging effect is none.
5. The applicable Aging Management Programs recommended in NUREG-1801 for Class 1 carbon and stainless steel piping, fittings, and branch

connections < 4 in. N.P.S. are also specified here for Class 1 valve bodies < 4 in. N.P.S.

6. The applicable Aging Management Programs recommended in NUREG-1801 for Class 1 carbon and stainless steel piping, fittings, and branch connections < 4 in. N.P.S. are also specified here for Class 1 valve bodies >= 4 in. N.P.S.
7. Cumulative Fatigue Damage (TLAA) is not included in NUREG-1801 as an aging effect for stainless steel bolting in BWRs. The bolting fatigue issue is addressed by TLAA, evaluated in accordance with 10CFR54.21(c).
8. Line item IV.C1-12 (R-27) for loss of preload for RCPB closure bolting does not apply since the A 193 B7 alloy steel closure bolting is not high-strength. Line item V.E-5 (EP-24) has been applied to the loss of preload aging effect for RCPB closure bolting.
9. Line item IV.C1-7 (R-23) for flow accelerated corrosion is not an applicable aging mechanism as this is a standby system.
10. ASME XI Inservice Inspection, Subsections IWB, IWC, and IWD does not apply to cracking of these items.
11. This item is comprised of piping >= 4 in. N.P.S., therefore ASME XI Inservice Inspection, Subsections IWB, IWC, and IWD applies and One-Time Inspection is not required.
12. Stress corrosion cracking and intergranular stress corrosion cracking of carbon and low alloy steels are not considered applicable aging mechanisms in a treated water environment per EPRI Mechanical Tools, Appendix A.
13. Flow elements consist of carbon steel piping both < 4 in. N.P.S. and >= 4 in. N.P.S., and stainless steel piping and tubing < 4 in. N.P.S.
14. The Shutdown Cooling Pumps seal coolers and bearing housing coolers are evaluated with the Reactor Building Closed Cooling Water System.
15. The Shutdown Cooling Heat Exchangers are evaluated with the Reactor Building Closed Cooling Water System.

Table 3.3.2.1.37
Spent Fuel Pool Cooling System
Summary of Aging Management Evaluation

Table 3.3.2.1.37 Spent Fuel Pool Cooling System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Containment Atmosphere (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
			Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
		Stainless Steel	Containment Atmosphere (External)	Loss Of Preload	Bolting Integrity (B.1.12)			G
			Indoor Air (External)	Loss Of Preload	Bolting Integrity (B.1.12)			G
Diffuser	Direct Flow	Aluminum	Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	A
			Indoor Air (Internal)	None	None	V.F-2 (EP-3)	3.2.1-32	A

Table 3.3.2.1.37 Spent Fuel Pool Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Diffuser	Direct Flow	Aluminum	Treated Water < 140F (External)	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-5 (AP-38)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.A4-5 (AP-38)	3.3.1-15	B
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-5 (AP-38)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.A4-5 (AP-38)	3.3.1-15	B
Flow Element	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-11 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.A4-11 (A-58)	3.3.1-22	B
	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-11 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.A4-11 (A-58)	3.3.1-22	B

Table 3.3.2.1.37 Spent Fuel Pool Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchangers (Augmented Fuel Pool Cooling and Fuel Pool Cooling)								3
Piping and fittings	Leakage Boundary	Aluminum	Concrete (External)	None	None			G, 1
			Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	A
			Soil (External)	Loss of Material	Buried Piping Inspection (B.1.26)			G
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-5 (AP-38)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.A4-5 (AP-38)	3.3.1-15	B
		Carbon and low alloy steel	Concrete (External)	None	None	VII.J-24 (AP-3)	3.3.1-78	A
			Containment Atmosphere (External)	None	None	VII.I-7 (A-77)	3.3.1-12	I, 2
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E

Table 3.3.2.1.37 Spent Fuel Pool Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Indoor Air (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.F3-6 (A-11)	3.3.1-16	E
			Soil (External)	Loss of Material	Buried Piping Inspection (B.1.26)	VII.C1-19 (A-01)	3.3.1-18	B
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-11 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.A4-11 (A-58)	3.3.1-22	B
	Pressure Boundary	Aluminum	Concrete (External)	None	None			G, 1
			Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	A
			Treated Water < 140F (External)	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-5 (AP-38)	3.3.1-15	A

Table 3.3.2.1.37 Spent Fuel Pool Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Aluminum	Treated Water < 140F (External)	Loss of Material	Water Chemistry (B.1.2)	VII.A4-5 (AP-38)	3.3.1-15	B
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-5 (AP-38)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.A4-5 (AP-38)	3.3.1-15	B
		Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
		Stainless Steel	Concrete (External)	None	None	VII.J-19 (AP-19)	3.3.1-78	A
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-11 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.A4-11 (A-58)	3.3.1-22	B

Table 3.3.2.1.37 Spent Fuel Pool Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pump Casing (Fuel Pool Cooling Pumps & Augmented Fuel Pool Cooling Pumps)	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
		Cast Iron	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water <140F (Internal)	Loss of Material	Selective Leaching of Materials (B.1.25)	VII.A4-10 (AP-31)	3.3.1-67	A
Thermowells	Pressure Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E

Table 3.3.2.1.37 Spent Fuel Pool Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Thermowells	Pressure Boundary	Carbon and low alloy steel	Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
Valve Body	Leakage Boundary	Aluminum	Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-5 (AP-38)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.A4-5 (AP-38)	3.3.1-15	B
		Carbon and low alloy steel	Containment Atmosphere (External)	None	None	VII.I-7 (A-77)	3.3.1-12	I, 2
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Table 3.3.2.1.37 Spent Fuel Pool Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Leakage Boundary	Stainless Steel	Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-11 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.A4-11 (A-58)	3.3.1-22	B
	Pressure Boundary	Aluminum	Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-5 (AP-38)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.A4-5 (AP-38)	3.3.1-15	B
		Carbon and low alloy steel	Containment Atmosphere (External)	None	None	VII.I-7 (A-77)	3.3.1-12	I, 2
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Table 3.3.2.1.37 Spent Fuel Pool Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Stainless Steel	Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-11 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.A4-11 (A-58)	3.3.1-22	B

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The aging effect for aluminum encased in concrete is none. This is consistent with industry guidance.
2. Based on past precedence (NUREG-1796, Dresden and Quad Cities SER, paragraph 3.1.2.4.1), the Staff concluded that the loss of material due to corrosion is not considered a credible aging effect for carbon steel components in a containment nitrogen environment because of negligible amounts of free oxygen (less than 4 percent by volume during normal operation). Both oxygen and moisture must be present for general corrosion to occur because oxygen alone or water free of dissolved oxygen (high humidity in a nitrogen atmosphere) does not corrode carbon steel to any practical extent. The staff found the applicant's identification of no loss of material for the carbon steel components exposed to a containment nitrogen environment acceptable because, with the negligible amounts of free oxygen, anodic reactions do not take place and the corrosion cell does not form. Therefore, no loss of material due to corrosion takes place and the aging effect is none.
3. The Augmented Fuel Pool Cooling Heat Exchanger and the Fuel Pool Cooling Heat Exchanger are evaluated with the Reactor Building Closed Cooling Water System.

Table 3.3.2.1.38
Standby Liquid Control System (Liquid Poison System)
Summary of Aging Management Evaluation

Table 3.3.2.1.38 Standby Liquid Control System (Liquid Poison System)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Accumulator	Pressure Boundary	Alloy Steel	Dry Gas (Internal)	None	None	VII.J-26 (AP-6)	3.3.1-79	A, 5
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.A4-12 (A-40)	3.3.1-22	A, 5
					Water Chemistry (B.1.2)	VII.A4-12 (A-40)	3.3.1-22	B, 5
Closure bolting	Mechanical Closure	Alloy Steel	Containment Atmosphere (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
				Loss of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 2
			Indoor Air (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A

Table 3.3.2.1.38 Standby Liquid Control System (Liquid Poison System) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Alloy Steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
						VII.I-4 (AP-27)	3.3.1-35	B
				Loss of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 2
						VII.I-5 (AP-26)	3.3.1-35	B
		Carbon and low alloy steel	Containment Atmosphere (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
				Loss of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 2
			Indoor Air (External)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-13 (R-28)	3.1.1-3	A
				Loss of Material	Bolting Integrity (B.1.12)	IV.C1-14 (R-26)	3.1.1-44	B
						VII.I-4 (AP-27)	3.3.1-35	B

Table 3.3.2.1.38 Standby Liquid Control System (Liquid Poison System) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Indoor Air (External)	Loss of Preload	Bolting Integrity (B.1.12)	V.E-5 (EP-24)	3.2.1-25	B, 2
						VII.I-5 (AP-26)	3.3.1-35	B
Flow Element	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Treated Water <140F (Internal)	Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A, 4
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B, 4
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E

Table 3.3.2.1.38 Standby Liquid Control System (Liquid Poison System) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B

Table 3.3.2.1.38 Standby Liquid Control System (Liquid Poison System) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Copper	Dry Gas (Internal)	None	None	VII.J-5 (AP-9)	3.3.1-79	A
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
		Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Dry Gas (Internal)	None	None	VII.J-21 (AP-22)	3.3.1-79	A
			Indoor Air (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
						VII.J-17 (AP-17)	3.3.1-76	A
			Sodium Pentaborate (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	VII.E2-1 (A-59)	3.3.1-4	A, 6
					Water Chemistry (B.1.2)	VII.E2-1 (A-59)	3.3.1-4	B, 6
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A, 1, 6

Table 3.3.2.1.38 Standby Liquid Control System (Liquid Poison System) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Sodium Pentaborate (Internal)	Loss of Material	Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B, 1, 6
			Treated Water (Internal)	Cracking Initiation and Growth	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1-1 (R-03)	3.1.1-9	B
						IV.C1-2 (R-55)	3.1.1-21	B
					One-Time Inspection (B.1.24)	IV.C1-1 (R-03)	3.1.1-9	A
						IV.C1-2 (R-55)	3.1.1-21	A
					Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	B
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B

Table 3.3.2.1.38 Standby Liquid Control System (Liquid Poison System) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
	Structural Support	Stainless Steel	Dry Gas (Internal)	None	None	VII.J-21 (AP-22)	3.3.1-79	A
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Pump Casing	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A

Table 3.3.2.1.38 Standby Liquid Control System (Liquid Poison System) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pump Casing	Pressure Boundary	Stainless Steel	Treated Water <140F (Internal)	Loss of Material	Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
Tanks (Liquid Poison Tank)	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Sodium Pentaborate (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	VII.E2-1 (A-59)	3.3.1-4	A, 6
					Water Chemistry (B.1.2)	VII.E2-1 (A-59)	3.3.1-4	B, 6
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A, 1, 6
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B, 1, 6
Tanks (Liquid Poison Test Tank)	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
Thermowell	Pressure Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Table 3.3.2.1.38 Standby Liquid Control System (Liquid Poison System) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Thermowell	Pressure Boundary	Stainless Steel	Sodium Pentaborate (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	VII.E2-1 (A-59)	3.3.1-4	A, 6
					Water Chemistry (B.1.2)	VII.E2-1 (A-59)	3.3.1-4	B, 6
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A, 1, 6
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B, 1, 6
Valve Body	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B

Table 3.3.2.1.38 Standby Liquid Control System (Liquid Poison System) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Brass	Dry Gas (Internal)	None	None	VII.J-5 (AP-9)	3.3.1-79	A
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
		Stainless Steel	Containment Atmosphere (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
			Dry Gas (Internal)	None	None	VII.J-21 (AP-22)	3.3.1-79	A
			Indoor Air (External)	None	None	IV.E-3 (RP-04)	3.1.1-71	A
						VII.J-17 (AP-17)	3.3.1-76	A
			Sodium Pentaborate (Internal)	Cracking Initiation and Growth	One-Time Inspection (B.1.24)	VII.E2-1 (A-59)	3.3.1-4	A, 6
					Water Chemistry (B.1.2)	VII.E2-1 (A-59)	3.3.1-4	B, 6
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A, 1, 6
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B, 1, 6

Table 3.3.2.1.38 Standby Liquid Control System (Liquid Poison System) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking Initiation and Growth	Water Chemistry (B.1.2)	IV.C1-1 (R-03)	3.1.1-9	E, 3, 7
					One-Time Inspection (B.1.24)	IV.C2-2 (R-03)	3.1.1-9	E, 3, 7
						IV.C2-2 (R-55)	3.1.1-21	E, 3, 7
				Cumulative Fatigue Damage (TLAA)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	IV.C1-11 (R-04)	3.1.1-2	A
				Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
			Treated Water <140F (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The Aging Management Programs for the aging effect of "Loss of Material" in the Treated Water environment identified in the referenced NUREG-1801 Volume 2 Item column were applied to the Sodium Pentaborate environment since Sodium Pentaborate approximates Treated Water in aggressivity as identified in NUREG-1801 Volume 2 Chapter IX.
2. Line item IV.C1-12 (R-27) for loss of preload for RCPB closure bolting does not apply since the A 193 B7 alloy steel closure bolting is not high-strength. Line item V.E-5 (EP-24) has been applied to the loss of preload aging effect for RCPB closure bolting.
3. The applicable programs for the aging effect of cracking as identified in line items IV.C1-1 (R-03) and IV.C1-2 (R-55) for class 1 piping, fittings and branch connections < NPS 4 have been applied to valves < NPS 4.
4. The internal treated water environment for this RCPB component is < 140 Deg F since the component is normally isolated from the RCPB and is located outside of the Primary Containment. Neither line item IV.C1-1 (R-03) for cracking due to SCC/IGSCC or line item IV.C1-2 (R-55) for cracking due to thermal and mechanical loading apply to this component.
5. The accumulator bladder performs an active function and is short-lived (replaceable), therefore, the evaluation of aging effects is not required for the bladder. Bladder degradation is assumed for evaluating the aging effects of the accumulator vessel.
6. Under normal conditions, only the Liquid Poison Tank and the Liquid Poison Pump suction line, including branches to the first stop valve, contain a sodium pentaborate internal environment.

7. ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program does not apply to valves.

Table 3.3.2.1.39
Traveling In-Core Probe System
Summary of Aging Management Evaluation

Table 3.3.2.1.39 Traveling In-Core Probe System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Stainless Steel	Indoor Air (External)	Loss Of Preload	Bolting Integrity (B.1.12)			G
Piping and fittings	Pressure Boundary	Stainless Steel	Dry Gas (Internal)	None	None	VII.J-21 (AP-22)	3.3.1-79	A
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Valve Body	Pressure Boundary	Stainless Steel	Dry Gas (Internal)	None	None	VII.J-21 (AP-22)	3.3.1-79	A
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Notes	**Definition of Note**
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Table 3.3.2.1.40
Turbine Building Closed Cooling Water System
Summary of Aging Management Evaluation

Table 3.3.2.1.40 Turbine Building Closed Cooling Water System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
Coolers (Condensate Pump Motor)	Leakage Boundary	Copper Alloy	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-3 (AP-12)	3.3.1-38	B, 3
					Selective Leaching of Materials (B.1.25)	VII.A4-8 (AP-43)	3.3.1-65	A, 3
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A, 3, 4
Coolers (Condenser Vacuum Pump)	Leakage Boundary	Copper Alloy - Tube Side Components	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-3 (AP-12)	3.3.1-38	D
					Selective Leaching of Materials (B.1.25)	VII.A4-8 (AP-43)	3.3.1-65	C
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	C

Table 3.3.2.1.40 Turbine Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Coolers (Control Room AC)	Leakage Boundary	Carbon Steel - Shell Side Components	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-1 (A-63)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Coolers (Feedwater and Main Steam Sample)	Leakage Boundary	Copper	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-3 (AP-12)	3.3.1-38	B, 3
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A, 3
Coolers (Feedwater Pump Lube Oil)	Leakage Boundary	Copper Alloy - Tube Side Components	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-3 (AP-12)	3.3.1-38	D
					Selective Leaching of Materials (B.1.25)	VII.A4-8 (AP-43)	3.3.1-65	C
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	C
Coolers (Final Feedwater Facility)	Leakage Boundary	Stainless Steel - Shell Side Components	Closed Cooling Water < 140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.E4-2 (A-67)	3.3.1-41	B
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	C

Table 3.3.2.1.40 Turbine Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Coolers (Hydrogen)	Leakage Boundary	Cast Iron - Tube Side Components	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VIII.E-6 (S-23)	3.4.1-24	B
					Selective Leaching of Materials (B.1.25)	VII.C2-7 (A-50)	3.3.1-43	C, 6
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Coolers (Reactor Recirculation Pump M-G Sets)	Leakage Boundary	Copper Alloy - Tube Side Components	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-3 (AP-12)	3.3.1-38	D
					Selective Leaching of Materials (B.1.25)	VII.A4-8 (AP-43)	3.3.1-65	C
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	C
Coolers (Service Air Compressor Aftercooler)	Leakage Boundary	Carbon Steel - Shell Side Components	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-1 (A-63)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Coolers (Service Air Compressor Cylinders)	Leakage Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	D, 5

Table 3.3.2.1.40 Turbine Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Coolers (Service Air Compressor Cylinders)	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Coolers (Service Air Compressor InterCooler)	Leakage Boundary	Carbon Steel - Tube Side Components	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VIII.E-6 (S-23)	3.4.1-24	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Coolers (Stator Winding Liquid)	Leakage Boundary	Carbon Steel - Tube Side Components	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VIII.E-6 (S-23)	3.4.1-24	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Coolers (Thermal Control Unit)	Leakage Boundary	Carbon Steel - Shell Side Components	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-1 (A-63)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Coolers (Turbine Lube Oil)	Leakage Boundary	Carbon Steel - Tube Side Components	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VIII.E-6 (S-23)	3.4.1-24	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Filter Housing	Leakage Boundary	Stainless Steel	Closed Cooling Water < 140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-9 (A-52)	3.3.1-39	B

Table 3.3.2.1.40 Turbine Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Filter Housing	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Flexible Connection	Leakage Boundary	Stainless Steel	Closed Cooling Water < 140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-9 (A-52)	3.3.1-39	B
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Flow Element	Leakage Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Flow Glass	Leakage Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
		Glass	Closed Cooling Water (Internal)	None	None			G, 1
			Indoor Air (External)	None	None	VII.J-10 (AP-14)	3.3.1-75	A
Gauge Snubber	Leakage Boundary	Stainless Steel	Closed Cooling Water < 140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-9 (A-52)	3.3.1-39	B

Table 3.3.2.1.40 Turbine Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Gauge Snubber	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Heat Exchangers (Generator Bus)	Leakage Boundary	Copper - Tube Side Components	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-3 (AP-12)	3.3.1-38	D
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	C
Heat Exchangers (TBCCW)	Leakage Boundary	Carbon and low alloy steel - Shell Side Components	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-1 (A-63)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Level Glass	Leakage Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
		Glass	Closed Cooling Water (Internal)	None	None			G, 1
			Indoor Air (External)	None	None	VII.J-10 (AP-14)	3.3.1-75	A

Table 3.3.2.1.40 Turbine Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Leakage Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	B
					One-Time Inspection (B.1.24)	VII.C2-14 (A-25)	3.3.1-42	E, 2
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
		Galvanized Steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)			G
					One-Time Inspection (B.1.24)			G, 2
			Indoor Air (External)	None	None	VII.J-8 (AP-13)	3.3.1-74	A
		Stainless Steel	Closed Cooling Water < 140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-9 (A-52)	3.3.1-39	B
					One-Time Inspection (B.1.24)	VII.C2-9 (A-52)	3.3.1-39	E, 2
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Table 3.3.2.1.40 Turbine Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pump Casing (TBCCW Pumps, Chemical Feed Pump)	Leakage Boundary	Cast Iron	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-7 (A-50)	3.3.1-43	B
					Selective Leaching of Materials (B.1.25)	VII.C2-7 (A-50)	3.3.1-43	A
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Strainer Body	Leakage Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Tanks (Surge, Chemical Mixing, Closed Cooling Water)	Leakage Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
Thermowell	Leakage Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	B

Table 3.3.2.1.40 Turbine Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Thermowell	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
		Stainless Steel	Closed Cooling Water < 140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-9 (A-52)	3.3.1-39	B
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
Valve Body	Leakage Boundary	Carbon and low alloy steel	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-14 (A-25)	3.3.1-42	B
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
		Copper Alloy	Closed Cooling Water (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-3 (AP-12)	3.3.1-38	B
					Selective Leaching of Materials (B.1.25)	VII.A4-8 (AP-43)	3.3.1-65	A
			Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
		Stainless Steel	Closed Cooling Water < 140F (Internal)	Loss of Material	Closed-Cycle Cooling Water System (B.1.14)	VII.C2-9 (A-52)	3.3.1-39	B
			Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. The aging effects identified for this material/environment combination are consistent with industry standards.
2. The One-Time Inspection program confirms the absence of aging effects in stagnant flow areas.
3. Coolers that consist only of coiled tubing or rows of tubing are included in the component category of piping, piping components, and piping elements.
4. Only the failure of the portion of the cooler external to the motor housing will result in external leakage (spatial interaction).
5. The cooling water channel is integral to the compressor housing. For the Leakage Boundary intended function, only the indoor air external environment is considered.
6. The aging mechanisms of general, pitting, and crevice corrosion are managed by line item VIII.E-6 (S-23).

Table 3.3.2.1.41
Water Treatment & Distr. System
Summary of Aging Management Evaluation

Table 3.3.2.1.41 Water Treatment & Distr. System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Bolting Integrity (B.1.12)	VII.I-4 (AP-27)	3.3.1-35	B
				Loss Of Preload	Bolting Integrity (B.1.12)	VII.I-5 (AP-26)	3.3.1-35	B
Filter Housing (including Purifier M-12-1)	Leakage Boundary	Polymers (plastic)	Indoor Air (External)	None	None			F
			Treated Water (Internal)	None	None			F, 2
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
Flexible Hose	Leakage Boundary	Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A

Table 3.3.2.1.41 Water Treatment & Distr. System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flexible Hose	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
Flow Element	Leakage Boundary	Aluminum	Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	A
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-4 (AP-38)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-4 (AP-38)	3.3.1-15	B
Flow Meter	Leakage Boundary	Cast Iron	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Selective Leaching of Materials (B.1.25)	VII.E4-11 (AP-31)	3.3.1-67	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
Piping and fittings	Leakage Boundary	Aluminum	Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	A

Table 3.3.2.1.41 Water Treatment & Distr. System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Leakage Boundary	Aluminum	Soil (External)	Loss of Material	Buried Piping Inspection (B.1.26)			G
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-4 (AP-38)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-4 (AP-38)	3.3.1-15	B
		Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B

Table 3.3.2.1.41 Water Treatment & Distr. System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and fittings	Pressure Boundary	Carbon and low alloy steel	Containment Atmosphere (External)	None	None	VII.D-3 (A-80)	3.3.1-12	I, 1
			Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Indoor Air (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.F3-6 (A-11)	3.3.1-16	E
Restricting Orifice	Leakage Boundary	Carbon and low alloy steel	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A

Table 3.3.2.1.41 Water Treatment & Distr. System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Restricting Orifice	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
Tanks (including Hot Water Heater H-12-1)	Leakage Boundary	Aluminum	Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	A
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-4 (AP-38)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-4 (AP-38)	3.3.1-15	B
Valve Body	Leakage Boundary	Aluminum	Indoor Air (External)	None	None	V.F-2 (EP-3)	3.2.1-32	A
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-4 (AP-38)	3.3.1-15	A
					Water Chemistry (B.1.2)	VII.E4-4 (AP-38)	3.3.1-15	B
		Brass	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A
			Treated Water (Internal)	Loss of Material	Selective Leaching of Materials (B.1.25)	VII.E4-10 (AP-32)	3.3.1-65	A
		Bronze	Indoor Air (External)	None	None	V.F-4 (EP-10)	3.2.1-35	A

Table 3.3.2.1.41 Water Treatment & Distr. System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Leakage Boundary	Bronze	Treated Water (Internal)	Loss of Material	Selective Leaching of Materials (B.1.25)	VII.E4-10 (AP-32)	3.3.1-65	A
		Cast Iron	Indoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VII.I-7 (A-77)	3.3.1-12	E
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-19 (A-35)	3.3.1-15	A
					Selective Leaching of Materials (B.1.25)	VII.E4-11 (AP-31)	3.3.1-67	A
					Water Chemistry (B.1.2)	VII.E4-19 (A-35)	3.3.1-15	B
		Stainless Steel	Indoor Air (External)	None	None	VII.J-17 (AP-17)	3.3.1-76	A
			Treated Water (Internal)	Loss of Material	One-Time Inspection (B.1.24)	VII.E4-15 (A-58)	3.3.1-22	A
					Water Chemistry (B.1.2)	VII.E4-15 (A-58)	3.3.1-22	B
	Pressure Boundary	Carbon and low alloy steel	Containment Atmosphere (External)	None	None	VII.D-3 (A-80)	3.3.1-12	I, 1
			Containment Atmosphere (Internal)	None	None	VII.D-3 (A-80)	3.3.1-12	I, 1

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

1. Based on past precedence (NUREG-1796, Dresden and Quad Cities SER, paragraph 3.1.2.4.1), the Staff concluded that the loss of material due to corrosion is not considered a credible aging effect for carbon steel components in a containment nitrogen environment because of negligible amounts of free oxygen (less than 4 percent by volume during normal operation). Both oxygen and moisture must be present for general corrosion to occur because oxygen alone or water free of dissolved oxygen (high humidity in a nitrogen atmosphere) does not corrode carbon steel to any practical extent. The staff found the applicant’s identification of no loss of material for the carbon steel components exposed to a containment nitrogen environment acceptable because, with the negligible amounts of free oxygen, anodic reactions do not take place and the corrosion cell does not form. Therefore, no loss of material due to corrosion takes place and the aging effect is none.
2. Based on industry operating experience aging of thermoplastics in treated water environments is not an applicable aging effect. (Mechancial Tools, Treated Water - Appendix A)

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